FLORIDA ATLANTIC UNIVERSITY

# PROGRAM CHANGE REQUEST
## Graduate Programs

UGPC Approval _____
UFS Approval _____
Banner Posted _____
Catalog _____

**Department** Biological Sciences

**College** Charles E. Schmidt College of Science

**Program Name**
Integrative Biology Doctoral Program

**Effective Date**
*(TERM & YEAR)*
Spring 2017

**Please explain the requested change(s) and offer rationale below or on an attachment**

Add tracks to the Integrative Biology PhD Program, see attached memo.

**Faculty Contact/Email/Phone**

Dr. Sarah Milton
smilton@fau.edu
561-297-3327

**Consult and list departments that may be affected by the change(s) and attach documentation**

See attached for full list of entities consulted and associated letters of support.

| ***Approved by*** | ***Date*** |
|---|---|
| Department Chair R.S. | 10-18-16 |
| College Curriculum Chair | 10-19-16 |
| College Dean Dr. Charles Roberts | 10.27.2016 |
| UGPC Chair Wm P McDonald | 11-9-2016 |
| Graduate College Dean | 11-14-16 |
| UFS President | |
| Provost | |

Email this form and attachments to UGPC@fau.edu one week before the UGPC meeting so that materials may be viewed on the UGPC website prior to the meeting.

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# Memorandum

**To:** University Program Committee

**From:** Rod Murphey, Director, Integrative Biology Ph.D. Program

**Subject:** Proposal to add a Biomedical Science and Marine Science and Oceanography track to the Integrative Biology Ph.D. Program

**Date: September 30, 2016**

This memo requests approval for the creation of two new tracks within the Integrative Biology Doctoral Degree Program: Integrative Biology-Biomedical Science (IB-BMS) and Integrative Biology-Marine Science and Oceanography (IB-MSO).

Completion of the IB-BMS concentration provides students with advanced knowledge and research experience in the biomedical science field. The IB-BMS curriculum focuses strongly on both knowledge-based and experimental-based biomedical science courses and teaches the student appropriate scientific methodology. Students who complete the IB-BMS concentration will develop the skills and expertise they need to succeed both within and outside academia. IB-BMS faculty are active experts in their respective biomedical science fields and will support development of the students' research in multiple advancing areas of basic and translational Biomedical Science. These areas of expertise include but are not limited to: Human Genetics & Genomics; Cancer Biology and Prevention; Microbiology, Immunology and Infectious Disease; HIV/AIDS Mechanisms and Treatments; Respiratory Physiology & Biophysics; Age-related Eye Diseases Including Cataract and Age-Related Macular Degeneration; Breast Cancer Mechanisms and Therapy; Cardiometobolic 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.

*The IB-BMS Program will provide a unique opportunity to provide students with combined basic and translational skills in Biomedicine that will prepare them for the growing opportunities in translational and applied Bioscience that is a hallmark of future growth in the strategic goals of The National Institutes of Health, The growing Biotechnology Industry and The Modern Pharmaceutical Industry. The IB- BMS track will complement and strengthen the strategic plan of FAU by enhancing the growth and*

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*diversity of learning opportunities surrounding the Pillars and Platforms being developed at FAU and will provide unique educational and vocational opportunities for FAU students.*

Completion of the IB-MSO concentration will provide students with a broad understanding of coastal, nearshore and oceanographic science, along with the research and inquiry skills necessary to independently conduct research and answer questions within their area of specialization. They will be well situated to enter the workforce ready to apply their skills to research, management and administrative questions related to coastal and oceanographic issues both within and outside of academia. The incorporation of HBOI faculty into the program will grant students an unprecedented opportunity to work directly with world class researchers in their labs and in the field. There has not been a science degree program that focused on coastal and marine issues in the past, nor has there been a large selection of graduate courses offered on these topics. This track will also foster collaboration between HBOI and existing strengths at FAU in coastal systems and marine biology and ecology. IB-MSO faculty are active in research and community engagement, as the expanding human population in South Florida is generating a need for a better understanding of coupled natural-human systems and the IB-MSO faculty work in diverse subtropical ecosystems, including developed and undeveloped coastlines, large estuaries, and coastal waters. Areas of expertise include but are not limited to: water quality issues, hydrology, underwater optical imaging and ocean monitoring, biogeochemical cycling, both endangered and invasive species, harmful algal blooms, and urbanization. FAU marine scientists have expertise in coastal ecosystems that are of economic importance including coral reefs, estuaries, coastal marshes and mangroves, lagoonal systems, beaches, and shallow banks, as well as ecosystems of the open oceans and seas. Primary research locations include Florida, the Bahamas, and the Caribbean.

*The IB-MSO track will promote cross-disciplinary training that will enable students to face the complex challenges of 21st century science. This degree track fits directly into the new FAU Strategic Plan with clear links to the pillars of Ocean Science and Engineering/Environmental Science, Community Engagement and Economic Development, and Sensing and Smart Systems.*

The attached catalog description incorporates proposed changes (in red) to the current catalog description of the PhD degree in Integrative Biology. The IB-BMS and IB-MSO tracks will use existing courses currently approved for the IB PhD Degree and no new courses need to be developed or approved to create all the required courses and learning experiences for these tracks. All faculty teaching are already members of the Graduate Faculty at Florida Atlantic University and are already teaching IB-PhD approved courses and mentoring IB-PHD students.

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Please note that The College of Medicine is submitting for approval two new course proposals separately from and in parallel with this new track proposal. The proposed new courses, "Biomedical Data/Informatics" and "Biomedical Writing," will serve as IB-BMS electives and are listed as such (highlighted yellow) in the attached catalog description. Please also note that the Department of Biology is submitting for approval one new course proposal in parallel with this new track proposal. The proposed new course, "Marine Conservation" will serve as an IB-MSO elect and is listed as such (highlighted yellow) in the attached catalog description. If these three newly proposed courses are not approved within the current proposal review period (UGPC Agenda items due to Graduate College by Oct. 24, 2016), those courses will be dropped from the concentration-specific elective course lists within this program change proposal.

As was put in place for our existing concentrations in Neuroscience and Environmental Science, we are also requesting that these tracks appear on student transcripts as the Major under Curriculum Information and that the concentrations be added to banner—that the following "Field of Study" codes "Attached to Major" IBIO be generated.

For Integrative Biology-Biomedical Science:
Banner Major: IBIO
Banner Field of Study: IBBS

For Integrative Biology-Marine Science and Oceanography:
Banner Major: IBIO
Banner Field of Study: IBMO

Please note that published program materials will contain the abbreviations IB-MSO and IB-BMS respectively. Banner Field of Study codes are restricted to four characters.

See the below examples.

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# Designations on Transcripts

**Curriculum Information**

**Current Program**

Doctor of Philosophy

| | |
|---|---|
| **Program:** | PHD Integrative Biology |
| **College:** | C.E. Schmidt Coll of Science |
| **Major:** | Integrative Biology-Biomedical Science |

**Curriculum Information**

**Current Program**

Doctor of Philosophy

PHD Integrative Biology

C.E. Schmidt Coll of Science

Integrative Biology-Marine Science and Oceanography

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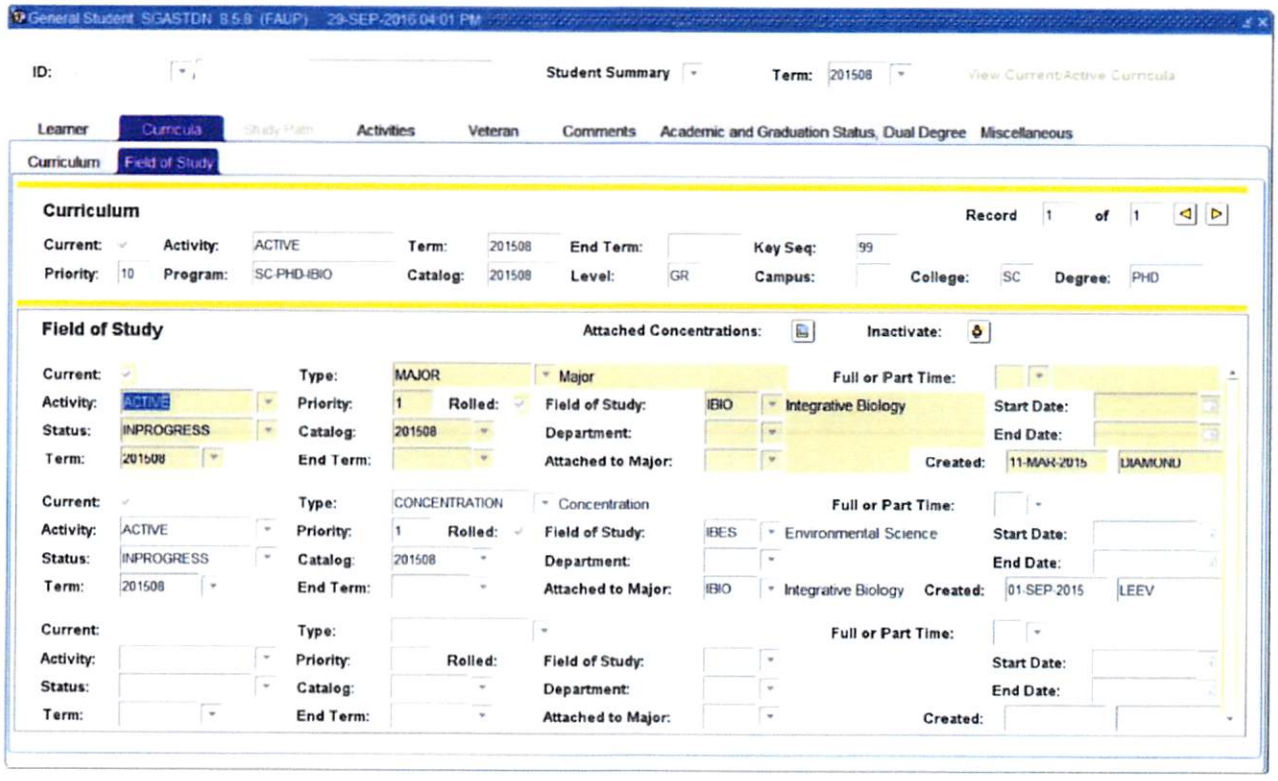
# Field of Study Codes in Banner (existing IBES and IBN are displayed)



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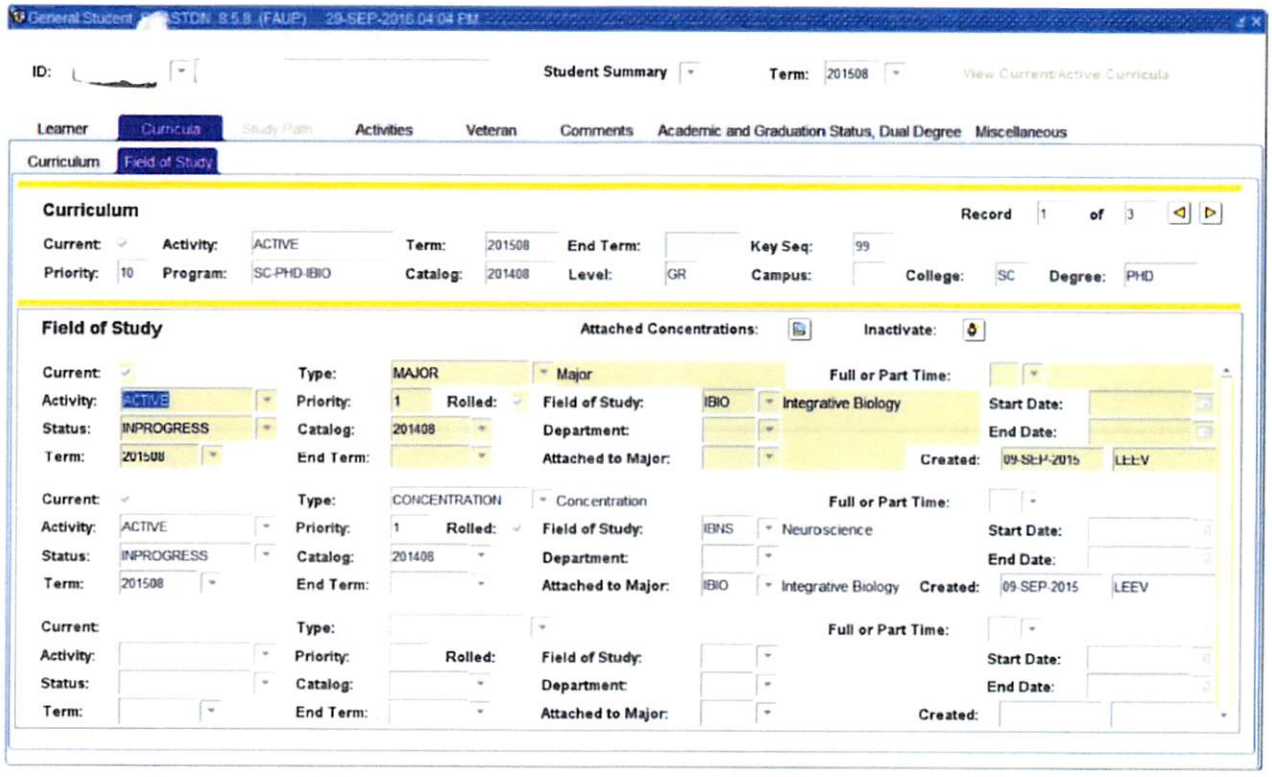

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# Proposed Edits to Catalog Entry (changes in red):

**Doctor of Philosophy with Major in Integrative Biology**

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 committee, 5) seminar courses and 6) dissertation research.

The Department of Biological Sciences, the Charles E. Schmidt College of Medicine, the Center for Molecular Biology and Biotechnology, 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.

Those applicants seeking a doctorate in Integrative Biology may choose to pursue the Integrative Biology core program or to pursue one of the program's four concentrations: Neuroscience (IB-N), Environmental Science (IB-ES), Biomedical Science (IB-BMS), or Marine Science and Oceanography (IB-MSO) 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 (IB-N)
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 IB-N 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. IB-N faculty are active experts in their respective neuroscience fields and will support development of the students who can

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focus o a number of research areas, including neuronal circuitry, learning and memory, neurodegeneration, drug discover, stress neurobiology, neurogenetics and/or neurodevelopment.

Environmental Science Concentration (IB-ES)
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. IB-ES faculty have considerable experience conducting research to address these difficult conservation problems, particularly in South Florida's extensive freshwater and marine ecosystems. The IB-ES 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 (IB-BMS)

Completion of the IB-BMS concentration provides students with advanced knowledge and research experience in the biomedical science field. The IB-BMS curriculum focuses strongly on both knowledge-based and experimental-based biomedical science courses and teaches the student appropriate scientific methodology. Students who complete the IB-BMS concentration will develop the skills and expertise they need to succeed both within and outside academia. IB-BMS faculty are active experts in their respective biomedical science fields and will support development of the students' research in the areas of Human Genetics & Genomics; Cancer Biology and Prevention; Microbiology, Immunology and Infectious Disease; HIV/AIDS Mechanisms and Treatments; Respiratory Physiology & Biophysics; Age-related Eye Diseases Including Cataract and Age-Related Macular Degeneration; Breast Cancer Mechanisms and Therapy; Cardiometobolic 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.

Marine Science and Oceanography Concentration (IB-MSO)

The IB-MSO concentration provides students with a broad understanding of oceanographic science, along with the research and inquiry skills necessary to independently conduct

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research within their area of specialization. The IB-MSO curriculum provides 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. IB-MSO faculty have expertise in diverse ocean ecosystems, including developed and undeveloped coastlines, large estuaries, and both deep sea and coastal waters, and will support development of the students' research 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 acceptable for admission to the Integrative Biology program includes the following criteria:

1. Applicants must have a baccalaureate degree 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.

3. Strength of letters of recommendation and personal statements from the applicants.

4. International students 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 whose transcripts are from non-U.S. institutions must have their credentials evaluated course-by-course. International students 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 IB-N 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. IB-ES applicants must have a Ph.D. supervisor from within FAU prior to

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applying. For IB-ES Ph.D. supervisor selection suggestions, students should refer to the Biology Department website to examine the fields and interests of individual faculty.
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), 4 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). 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

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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.

**Neuroscience Concentration (IB-N) Approved Electives**

Prerequisites

Students who enter the IB-N 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.

| | | |
|---|---|---|
| Neuroscience 1 | PSB 6345 | 3 |
| Neuroscience 2 | PSB 6346 | 3 |
| Practical Cell Neuroscience | BSC 5417C | 3 |
| Neurophysiology | PCB 5835C | 3 |
| Advanced Neurophysiology Lab | PCB 6837L | 3 |

Approved Electives

Students enrolled in the IB-N concentration must select graduate-level elective courses that are relevant to the field of neuroscience. See the approved electives tables below.

| General Neuroscience | | |
|---|---|---|
| Neuroscience 1 | PSB 6345 | 3 |
| Neuroscience 2 | PSB 6346 | 3 |
| Molecular and Cellular Neuroscience | | |
| Advanced Cell Physiology | PCB 6207 | 3 |
| Developmental Neurobiology | PSB 6515 | 3 |
| Brain Diseases: Mechanisms and Therapy | BMS 6736 | 3 |
| Cellular Neuroscience and Disease | PCB 6849 | 3 |
| Practical Cell Neuroscience | BSC 5417C | 3 |
| Autonomic Function and Diseases | BMS 6523 | 3 |

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| | | |
|---|---|---|
| Neurophysiology | PCB 5835C | 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 Cognition | EXP 6609 | 3 |
| Seminar in Human Perception | EXP 6208 | 3 |
| Theoretical and Dynamical Neuroscience | | |
| Computational Neuroscience 1 | ISC 6460 | 3 |
| Bioinformatics | BSC 6458C | 4 |
| Bioinformatics: Engineering Perspectives | BME 6762 | 3 |

**Environmental Science Concentration (IB-ES) Approved Electives**
Students enrolled in the IB-ES concentration must complete at least one course from each of the two focal areas below. Completion of these courses may be used toward fulfillment of the 9-credit Integrative Biology elective requirement.

| | | |
|---|---|---|
| Statistics and Modeling | | |
| Experimental Design and Biometry | PCB 6456 | 4 |
| Modeling Groundwater Movement | GLY 6836 | 3 |
| Ecological Modeling | EVR 6070 | 3 |
| Ecological Theory | PCB 6406 | 3 |
| Ecology and Earth Sciences | | |
| 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 |
| 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 |

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| | | |
|---|---|---|
| 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 6749C | 4 |
| Marine Geology | GLY 5736C | 3 |
| Advanced Topics in Applied, Coastal, and Hydrogeology | GLY 5934 | 3 |
| Regolith Geology | GLY 6707 | 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 Ichthylogy | 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 |

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| | | |
|---|---|---|
| Topics in Geoinformation Science | GIS 6120 | 3 |

## Biomedical Science Concentration (IB-BMS) Approved Electives

| | | |
|---|---|---|
| Advanced Cell Physiology | PCB 6207 | 3 |
| Biomedical Data/ Informatics | PCB 6088 | 3 |
| Human Genetics | PCB 6665 | 3 |
| Neurobiology of Addiction | PCB 5844 | 3 |
| Brain Diseases: Mechanism and Therapy | BMS 6736 | 3 |
| Molecular Biology of the Cardiovascular System and Cardiac Disease | PCB 6705 | 3 |
| Adult Neurogenesis | PCB 6848 | 3 |
| Advanced Molecular and Cell Biology | PCB 5532 | 3 |
| Macromolecules and Human Disease | GMS 6301 | 3 |
| Host Defense and Inflammation | MCB 6208 | 3 |
| Tumor Immunology | PCB 6239 | 3 |
| Developmental Neurobiology | PSB 6515 | 3 |
| Biomedical Writing | PCB 6092 | 3 |
| Integrated Morphology 1 | BMS 6102 C | 4 |
| Integrated Morphology 2 | BMS 6104 C | 4 |
| Clinical Microbiology | BMS 6303 | 3 |
| Molecular Basis of Human Cancer | PCB 6235 | 3 |
| Physiology of the Heart | PCB 6885 | 3 |
| Molecular Basis of Disease and Therapy | GMS 6302 | 3 |
| Autonomic Function and Disease | BMS 6523 | 3 |
| Problem-Based Immunology | PCB 6238 | 3 |
| Fundamentals of General Pathology | BMS 6601 | 3 |

## Marine Science and Oceanography Required Courses

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

| IB-MSO Required Courses | | |
|---|---|---|
| Physical & Geological Oceanography | OCE6097 | 3 |

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| | | |
|---|---|---|
| Biological and Chemical Oceanography | OCE 6057 | 3 |

**Approved Electives:** Students may choose from the following approved IB-MSO 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.

| **Marine Biology** | | |
|---|---|---|
| Marine Invertebrate Zoology | ZOO 6256 | 3 |
| Marine Invertebrate Zoology Lab | ZOO 6256L | 2 |
| 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 |
| Histology of Fishes and Aquatic Invertebrates | ZOO 6757 | 4 |
| Aquatic Animal Health | PCB 6772 | 3 |
| Physiology of Marine Animals | PCB 6775 | 3 |
| Advances in Finfish Aquaculture | BSC 6342 | 3 |
| Marine Molecular Biology | PCB 6465 | 3 |
| Sensory Biology & Behavior of Fishes | PCB 6871 | 3 |
| Ocean Exploration | BSC 6936 | 3 |
| Introduction to Marine Biotechnology | BSC 6346 | 3 |
| | | |
| **Conservation and Ecology** | | |
| Natural History of the Indian River Lagoon | OCB 6810 | 3 |
| Coastal Plant Ecology | BOT 6606 | 2 |
| Coastal Plant Ecology Lab | BOT 6606L | 2 |
| Coral Reef Ecosystems | OCB 6266 | 3 |
| Coral Reef Ecosystems Lab | OCB 6266L | 1 |
| Conservation Biology | PCB 6045 | 3 |
| Advanced Ecology | PCB 6046 | 3 |
| Marine and Estuarine Community Dynamics | PCB 6316 | 3 |
| Marine Ecology | PCB 6317 | 3 |
| Marine Ecology Lab and Field Studies | PSB 6317L | 2 |
| Marine Conservation | BSC 6316 | 3 |
| Ecological Theory | PCB 6406 | 3 |
| | | |
| **Remote Sensing and GIS** | | |

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| | | |
|---|---|---|
| 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 |
| | | |
| **Chemistry** | | |
| Chemistry for Environmental Scientists | CHS 6611 | 3 |
| Environmental Geochemistry | GLY 5243 | 3 |
| | | |
| **Marine Optics** | | |
| Data Processing for Studies and Modeling of Marine Systems | OCB 6673 | 3 |
| Underwater Optical Imaging for Marine Scientists | OCE 6267 | 3 |
| Marine Optics | OCE 6269 | 3 |
| Ocean Monitoring Systems and Implementation Strategies | OCE 6268 | 3 |

## Consult and list departments that may be affected by the change(s) and attach documentation

Charles E. Schmidt College of Medicine

The Environmental Science Program, Charles E. Schmidt College of Science

Harbor Branch Oceanographic Institute

Department of Psychology, Charles E. Schmidt College of Science

Department of Chemistry, Charles E. Schmidt College of Science

Department of Geosciences, Charles E. Schmidt College of Science

The Center for Complex Systems and Brain Sciences, Charles E. Schmidt College of Science

Department of Civil, Environmental and Geomatics Engineering

Department of Ocean and Mechanical Engineering

**Michelle Cavallo**

**From:** Sarah Milton
**Sent:** Wednesday, October 12, 2016 2:02 PM
**To:** Charles Roberts
**Cc:** Rodney Murphey; Michelle Cavallo
**Subject:** FW: Proposed change to IB Program

Dr. Sarah L. Milton
Associate Professor
Department of Biological Sciences
FAU

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**From:** Steven Bressler [bressler.stevenl@gmail.com]
**Sent:** Wednesday, October 12, 2016 11:34 AM
**To:** Sarah Milton
**Cc:** Janet Blanks
**Subject:** Proposed change to IB Program

Dear Dr. Milton,

This is to express my support for your proposal to add biomedical science and marine science and oceanography concentrations to the IB PhD Program.

Best wishes for success,

Steven L Bressler, PhD
Interim Director and Professor
Director of Ph.D. Program
Center for Complex Systems & Brain Sciences
Florida Atlantic University

## Michelle Cavallo

**From:** Yan Yong
**Sent:** Friday, October 21, 2016 5:18 PM
**To:** Rodney Murphey
**Cc:** Sarah Milton; Michelle Cavallo; Catherine Trivigno; Dan Meeroff
**Subject:** RE: Graduate Program Change Request-Proposal to add Biomedical Science and Marine Science and Oceanography concentrations to IB Ph.D. Program

Dear Dr. Murphey,

I would like to let you know that the Department of Civil, Environmental and Geomatics Engineering supports proposal proposal of adding two tracks to your integrative Biology Ph.D. Program. Please let me know if you have any questions.

Thanks,

Yan

*Yan Yong*
Professor and Chair
Department of Civil, Environmental & Geomatics Engineering
Florida Atlantic University
Office: (561)297-3445

**From:** Michelle Cavallo [mailto:MCAVALLO@fau.edu] **On Behalf Of** Rodney Murphey
**Sent:** Tuesday, October 11, 2016 9:26 AM
**To:** Yan Yong <yongy@fau.edu>
**Cc:** Sarah Milton <smilton@fau.edu>; Michelle Cavallo <MCAVALLO@fau.edu>; Catherine Trivigno <trivigno@fau.edu>; Digna Mejia <dmejia1@fau.edu>; Alegra Boatwright <aboatwright@fau.edu>
**Subject:** Graduate Program Change Request-Proposal to add Biomedical Science and Marine Science and Oceanography concentrations to IB Ph.D. Program

Dear Dr. Yong:

Please find attached the Graduate Program Change Request form to add concentrations in Biomedical Science (IB-BMS) and Marine Science and Oceanography (IB-MSO) to the Integrative Biology Ph.D. Program with an attached memo from Rod Murphey, Program Director.

Under the "Consult and list departments that might be affected by the change and attach comments" box, we are including the Department of Civil, Environmental and Geomatics Engineering.

Kindly send a letter of support or an email with your comments. If you have any questions, I can be reached at 561-297-0384.

Thank you very much for your time and attention.

Regards,

Michelle Cavallo

On behalf of
Rod Murphey, Professor and Chairman
Director, Integrative Biology Doctoral Program

Michelle Cavallo
Administrative Assistant & Graduate Coordinator
Department of Biological Sciences
Florida Atlantic University
777 Glades Road
Boca Raton, FL 33431
PH: 561-297-0384

**Michelle Cavallo**

| | |
|---|---|
| **From:** | Megan Davis |
| **Sent:** | Monday, October 10, 2016 2:56 PM |
| **To:** | Rodney Murphey |
| **Cc:** | Sarah Milton; Peter McCarthy; Michelle Cavallo; Catherine Trivigno; Patrick Boles; Anton Post; Daniel Flynn |
| **Subject:** | HBOI Letter of Support for IB-MSO Re: Graduate Program Change Request-Proposal to add Biomedical Science and Marine Science and Oceanography concentrations to IB Ph.D. Program |
| **Attachments:** | IB MSO Track HBOI Letter of Support October 10, 2016.pdf |

Dear Rod,

Please find attached FAU Harbor Branch's letter of support with comments to create and add a Marine Science and Oceanography track to the Integrative Biology Ph.D. degree program.

FAU Harbor Branch is excited to be a major participant in the success of this degree program track.

Thank you for this opportunity to provide a letter of support. Please let me know if you require additional information.

Megan

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Megan Davis, Ph.D.
Interim Executive Director
Harbor Branch Oceanographic Institute
Florida Atlantic University
772-242-2298 office
772-216-1523 cell
mdavi105@fau.edu

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**From:** Michelle Cavallo <MCAVALLO@fau.edu> on behalf of Rodney Murphey <RMURPHEY@fau.edu>
**Date:** Monday, October 10, 2016 at 12:18 PM
**To:** M Davis <mdavi105@fau.edu>
**Cc:** Sarah Milton <smilton@fau.edu>, Peter McCarthy <PMCCART5@fau.edu>, Michelle Cavallo <MCAVALLO@fau.edu>, Catherine Trivigno <trivigno@fau.edu>
**Subject:** Graduate Program Change Request-Proposal to add Biomedical Science and Marine Science and Oceanography concentrations to IB Ph.D. Program

Dear Dr. Davis:

Please find attached the Graduate Program Change Request form to add concentrations in Biomedical Science (IB-BMS) and Marine Science and Oceanography (IB-MSO) to the Integrative Biology Ph.D. Program with an attached memo from Rod Murphey, Program Director.

Under the "Consult and list departments that might be affected by the change and attach comments" box, we are including Harbor Branch Oceanographic Institute.

Kindly send a letter of support or an email with your comments.

Thank you very much for your time and attention.

Regards,

Michelle Cavallo

On behalf of
Rod Murphey, Professor and Chairman
Director, Integrative Biology Doctoral Program

Michelle Cavallo
Administrative Assistant & Graduate Coordinator
Department of Biological Sciences
Florida Atlantic University
777 Glades Road
Boca Raton, FL 33431
PH: 561-297-0384

HARBOR BRANCH

FLORIDA ATLANTIC UNIVERSITY

October 10, 2016

Rod Murphey, Ph.D.
Director, Integrative Biology Ph.D. Program
Professor and Chairman, Department of Biological Sciences
FAU CES College of Science

Dear Rod,

This letter of support is from FAU Harbor Branch Oceanographic Institute (Harbor Branch) to support the proposal to create and add a Marine Science and Oceanography track to the Integrative Biology Ph.D. Program (IB-MSO). Harbor Branch administration and faculty have been involved with the Integrative Biology Ph.D. degree program for many years and several graduate students have conducted or are conducting their research with Harbor Branch faculty.

We are excited about this proposal to be part of an IB-MSO track and to offer courses in conjunction with FAU college faculty. FAU Harbor Branch research faculty will be able to offer outstanding courses in the fields of marine science, ocean exploration and technology, and oceanography along with providing excellent research experiences for the graduate students that will prepare them for the workforce.

In order to offer these courses and research opportunities for graduate students it is important to note that since Harbor Branch 12-month research faculty are non-tenure faculty, Harbor Branch will need university funding to support the development of the courses, continued support for the teaching of the courses, and other additional support may be necessary for the degree program track delivery. We understand that if the new MS Marine Science and Oceanography degree (MS-MSO) is in place with an appropriate budget, it is not likely that additional support will be needed for Harbor Branch to deliver their portion of the IB-MSO track. However, if the new MS-MSO degree is not in place by the time the IB-MSO track is ready to begin, we will require university funding to be allocated to Harbor Branch.

Harbor Branch appreciates this opportunity to provide a letter of support for the IB-MSO track and we look forward to being a major participant in the success of this degree program track.

Sincerely,

Megan Davis

Megan Davis, Ph.D., Harbor Branch Interim Executive Director

cc: Patrick Boles, FAU Harbor Branch Associate Executive Director
Peter McCarthy, Ph.D., FAU Harbor Branch Research Faculty, Associate Director for Education
Sarah Milton, Ph.D., Associate Professor, Assoc. Dir. IB PhD Program, Depart of Biol. Sciences
Anton Post, Ph.D., FAU Harbor Branch Incoming Executive Director
Daniel Flynn, Ph.D., FAU VP of Research

## Michelle Cavallo

**From:** Gregg Fields
**Sent:** Monday, October 10, 2016 2:35 PM
**To:** Michelle Cavallo
**Cc:** Sarah Milton; Catherine Trivigno; Rodney Murphey
**Subject:** Re: Graduate Program Change Request-Proposal to add Biomedical Science and Marine Science and Oceanography concentrations to IB Ph.D. Program

Hi Michelle,

I support the new concentrations in Biomedical Science and Marine Science & Oceanography to the Integrative Biology Ph.D. Program.

Regards,

Gregg

Gregg B. Fields, Ph.D., FNAI
Professor and Chair, Department of Chemistry & Biochemistry
Director, Center for Molecular Biology & Biotechnology
Florida Atlantic University
5353 Parkside Drive
Building MC17, Room 211
Jupiter, FL 33458
561-799-8577

---

**From:** Michelle Cavallo <MCAVALLO@fau.edu> on behalf of Rodney Murphey <RMURPHEY@fau.edu>
**Date:** Monday, October 10, 2016 at 12:36 PM
**To:** Office 2004 Test Drive User <fieldsg@fau.edu>
**Cc:** Sarah Milton <smilton@fau.edu>, Michelle Cavallo <MCAVALLO@fau.edu>, Catherine Trivigno <trivigno@fau.edu>
**Subject:** Graduate Program Change Request-Proposal to add Biomedical Science and Marine Science and Oceanography concentrations to IB Ph.D. Program

Dear Dr. Fields:

Please find attached the Graduate Program Change Request form to add concentrations in Biomedical Science (IB-BMS) and Marine Science and Oceanography (IB-MSO) to the Integrative Biology Ph.D. Program with an attached memo from Rod Murphey, Program Director.

Under the "Consult and list departments that might be affected by the change and attach comments" box, we are including the Department of Chemistry.

Kindly send a letter of support or an email with your comments.

Thank you very much for your time and attention.

Regards,

Michelle Cavallo

On behalf of
Rod Murphey, Professor and Chairman
Director, Integrative Biology Doctoral Program

Michelle Cavallo
Administrative Assistant & Graduate Coordinator
Department of Biological Sciences
Florida Atlantic University
777 Glades Road
Boca Raton, FL 33431
PH: 561-297-0384

## Michelle Cavallo

**From:** Bob Stackman <rstackma@gmail.com>
**Sent:** Monday, October 10, 2016 2:10 PM
**To:** Rodney Murphey; Robert Stackman
**Cc:** Sarah Milton; Michelle Cavallo; Catherine Trivigno
**Subject:** Re: Graduate Program Change Request-Proposal to add Biomedical Science and Marine Science and Oceanography concentrations to IB Ph.D. Program

Dear Dr. Murphey,

The Department of Psychology fully supports the additional concentrations to the Integrative Biology graduate program.

Best of luck with the proposal,

Bob

Robert W. Stackman Jr., Ph.D.
Florida Atlantic University
Interim Chair
Department of Psychology
BS 101
777 Glades Road
Boca Raton, FL 33431

email: rstackma@fau.edu
Office - Jupiter: MC-19(RE), Rm 110
Phone - Jupiter: 561.799.8052

Office - Boca: BS 101B
Phone - Boca: 561.297.2270

On 10/10/16 12:17 PM, Rodney Murphey wrote:

> Dear Dr. Stackman:
>
> Please find attached the Graduate Program Change Request form to add concentrations in Biomedical Science (IB-BMS) and Marine Science and Oceanography (IB-MSO) to the Integrative Biology Ph.D. Program with an attached memo from Rod Murphey, Program Director.
>
> Under the "Consult and list departments that might be affected by the change and attach comments" box, we are including the Department of Psychology.
>
> Kindly send a letter of support or an email with your comments.
>
> Thank you very much for your time and attention.
>
> Regards,
>
> Michelle Cavallo
>
> On behalf of

Rod Murphey, Professor and Chairman
Director, Integrative Biology Doctoral Program

Michelle Cavallo
Administrative Assistant & Graduate Coordinator
Department of Biological Sciences
Florida Atlantic University
777 Glades Road
Boca Raton, FL 33431
PH: 561-297-0384

**Michelle Cavallo**

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**From:** Dale Gawlik <dgawlik@fau.edu>
**Sent:** Monday, October 03, 2016 2:00 PM
**To:** Rodney Murphey
**Cc:** Sarah Milton; Michelle Cavallo; Catherine Trivigno
**Subject:** Re: Graduate Program Change Request-Proposal to add Biomedical Science and Marine Science and Oceanography concentrations to IB Ph.D. Program

Rod,

The Environmental Science Program administers the Environmental Science concentration of the IB degree (IBES). The proposed Marine Science and Oceanography concentration of the IB degree does not overlap greatly with IBES. The concerted effort to focus the Marine Science and Oceanography degree to areas of marine science that are not currently covered by the Environmental Science concentration make it likely that the IB degree will attract a new cohort of applicants that might not have been interested in the previous concentrations in IB.

As such, the Environmental Science Program strongly supports the development of the Marine Science and Oceanography concentration of the IB degree.

Dale Gawlik

On 9/30/2016 11:59 AM, Rodney Murphey wrote:

> Dear Dr. Gawlik:
>
> Please find attached the Graduate Program Change Request form to add concentrations in Biomedical Science (IB-BMS) and Marine Science and Oceanography (IB-MSO) to the Integrative Biology Ph.D. Program with an attached memo from Rod Murphey, Program Director.
>
> Under the "Consult and list departments that might be affected by the change and attach comments" box, we are including the Environmental Science Master's Program.
>
> Kindly send a letter of support or an email with your comments.
>
> Thank you very much for your time and attention.

Regards,

Michelle Cavallo

On behalf of

Rod Murphey, Professor and Chairman

Director, Integrative Biology Doctoral Program

Michelle Cavallo

Administrative Assistant & Graduate Coordinator

Department of Biological Sciences

Florida Atlantic University

777 Glades Road

Boca Raton, FL 33431

PH: 561-297-0384

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~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Dr. Dale E. Gawlik, Director
Environmental Science Program
Professor of Biological Sciences
Florida Atlantic University
777 Glades Road
Boca Raton, FL 33431-0991
561.297.3333
561.297.2749 (fax)
dgawlik@fau.edu
www.science.fau.edu/biology/gawliklab
www.science.fau.edu/biology/envirosci
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

## Michelle Cavallo

**From:** Zhixiao Xie
**Sent:** Wednesday, October 05, 2016 10:37 AM
**To:** Rodney Murphey; Charles Roberts
**Cc:** Sarah Milton; Michelle Cavallo; Catherine Trivigno
**Subject:** RE: Graduate Program Change Request-Proposal to add Biomedical Science and Marine Science and Oceanography concentrations to IB Ph.D. Program

Dear Dr. Murphey,
The Geosciences Department supports the proposed IB-MSO.

Zhixiao

---

Dr. Zhixiao Xie
Professor and Chair
Geosciences Department
Florida Atlantic University
Tel: 561-297-2852

**From:** Michelle Cavallo [mailto:MCAVALLO@fau.edu] **On Behalf Of** Rodney Murphey
**Sent:** Friday, September 30, 2016 11:59 AM
**To:** Zhixiao Xie <xie@fau.edu>; Charles Roberts <croberts@fau.edu>
**Cc:** Sarah Milton <smilton@fau.edu>; Michelle Cavallo <MCAVALLO@fau.edu>; Catherine Trivigno <trivigno@fau.edu>
**Subject:** Graduate Program Change Request-Proposal to add Biomedical Science and Marine Science and Oceanography concentrations to IB Ph.D. Program

Dear Drs. Xie and Roberts:

Please find attached the Graduate Program Change Request form to add concentrations in Biomedical Science (IB-BMS) and Marine Science and Oceanography (IB-MSO) to the Integrative Biology Ph.D. Program with an attached memo from Rod Murphey, Program Director.

Under the "Consult and list departments that might be affected by the change and attach comments" box, we are including the Department of Geosciences.

Kindly send a letter of support or an email with your comments.

Thank you very much for your time and attention.

Regards,

Michelle Cavallo

On behalf of
Rod Murphey, Professor and Chairman
Director, Integrative Biology Doctoral Program

Michelle Cavallo
Administrative Assistant & Graduate Coordinator
Department of Biological Sciences
Florida Atlantic University
777 Glades Road
Boca Raton, FL 33431
PH: 561-297-0384

## Michelle Cavallo

**From:** Bridget Statler
**Sent:** Tuesday, October 04, 2016 1:54 PM
**To:** Rodney Murphey
**Cc:** John Newcomer; Marc Kantorow; Michelle Cavallo
**Subject:** RE: Graduate Program Change Request-Proposal to add Biomedical Science and Marine Science and Oceanography concentrations to IB Ph.D. Program
**Attachments:** Support Letter IB-BMS.pdf

Hi Rod Murphey,
Please review the attached support letter for IB-BMS attached. Thanks. Have a good day!

Bridget Statler, M. Ed.
Graduate Programs Coordinator
Charles E. Schmidt College of Medicine
Florida Atlantic University
777 Glades Road,
Boca Raton, FL 33431
BC 71, Room 206 A
561-297-4549
bstatler@health.fau.edu

FAU CHARLES E. SCHMIDT COLLEGE OF MEDICINE
Florida Atlantic University

**From:** Michelle Cavallo [mailto:MCAVALLO@fau.edu] **On Behalf Of** Rodney Murphey
**Sent:** Friday, September 30, 2016 11:59 AM
**To:** John Newcomer <jnewcomer@health.fau.edu>; Marc Kantorow <MKANTORO@health.fau.edu>
**Cc:** Bridget Statler <BSTATLER@health.fau.edu>; Sarah Milton <smilton@fau.edu>; Michelle Cavallo <MCAVALLO@fau.edu>; Catherine Trivigno <trivigno@fau.edu>
**Subject:** Graduate Program Change Request-Proposal to add Biomedical Science and Marine Science and Oceanography concentrations to IB Ph.D. Program

Dear Drs. Newcomer and Kantorow:

Please find attached the Graduate Program Change Request form to add concentrations in Biomedical Science (IB-BMS) and Marine Science and Oceanography (IB-MSO) to the Integrative Biology Ph.D. Program with an attached memo from Rod Murphey, Program Director.

Under the "Consult and list departments that might be affected by the change and attach comments" box, we are including Harbor Branch Oceanographic Institute.

Kindly send a letter of support or an email with your comments.

Thank you very much for your time and attention.

Regards,

Michelle Cavallo

On behalf of
Rod Murphey, Professor and Chairman
Director, Integrative Biology Doctoral Program

Michelle Cavallo
Administrative Assistant & Graduate Coordinator
Department of Biological Sciences
Florida Atlantic University
777 Glades Road
Boca Raton, FL 33431
PH: 561-297-0384

FAU
FLORIDA ATLANTIC UNIVERSITY

Charles E. Schmidt College of Medicine
777 Glades Road
Boca Raton, FL 33431
tel: 561.297.4549

Dear Rod Murphey,
Thank you for all your help and hard work making the IB-Biomed PHD emphasis possible. We approve the documentation you sent and again are very grateful for your support.

Thanks again.

Regards,

Bridget Statler

On behalf of
Dr. Marc Kantorow Assistant Dean for Graduate Programs

Marc Kantorow

## Michelle Cavallo

**From:** Javad Hashemi
**Sent:** Tuesday, October 11, 2016 8:49 AM
**To:** Rodney Murphey
**Cc:** Sarah Milton; Michelle Cavallo; Catherine Trivigno; Anastasia Calnick; Barbara Steinberg
**Subject:** RE: Graduate Program Change Request-Proposal to add Biomedical Science and Marine Science and Oceanography concentrations to IB Ph.D. Program

Dear Michelle, as we discussed, there is no conflict with Ocean Enginnering. We support this. I suggest you contact Civil Engineering, Dr. Yong for his thoughts.
Thank you.
J. Hashemi

**From:** Michelle Cavallo [mailto:MCAVALLO@fau.edu] **On Behalf Of** Rodney Murphey
**Sent:** Tuesday, October 11, 2016 7:56 AM
**To:** Javad Hashemi <jhashemi@fau.edu>
**Cc:** Sarah Milton <smilton@fau.edu>; Michelle Cavallo <MCAVALLO@fau.edu>; Catherine Trivigno <trivigno@fau.edu>; Anastasia Calnick <acalnick@fau.edu>; Barbara Steinberg <bsteinbe@fau.edu>
**Subject:** FW: Graduate Program Change Request-Proposal to add Biomedical Science and Marine Science and Oceanography concentrations to IB Ph.D. Program

Dear Dr. Hashemi:

Please find attached the Graduate Program Change Request form to add concentrations in Biomedical Science (IB-BMS) and Marine Science and Oceanography (IB-MSO) to the Integrative Biology Ph.D. Program with an attached memo from Rod Murphey, Program Director.

Under the "Consult and list departments that might be affected by the change and attach comments" box, we are including the Department of Ocean and Mechanical Engineering.

Kindly send a letter of support or an email with your comments.

Thank you very much for your time and attention.

Regards,

Michelle Cavallo

On behalf of
Rod Murphey, Professor and Chairman
Director, Integrative Biology Doctoral Program

Michelle Cavallo
Administrative Assistant & Graduate Coordinator
Department of Biological Sciences
Florida Atlantic University
777 Glades Road
Boca Raton, FL 33431

PH: 561-297-0384

**From:** Michelle Cavallo **On Behalf Of** Rodney Murphey
**Sent:** Friday, September 30, 2016 11:59 AM
**To:** Javad Hashemi <jhashemi@fau.edu>
**Cc:** Sarah Milton <smilton@fau.edu>; Michelle Cavallo <MCAVALLO@fau.edu>; Catherine Trivigno <trivigno@fau.edu>
**Subject:** Graduate Program Change Request-Proposal to add Biomedical Science and Marine Science and Oceanography concentrations to IB Ph.D. Program

Dear Dr. Hashemi:

Please find attached the Graduate Program Change Request form to add concentrations in Biomedical Science (IB-BMS) and Marine Science and Oceanography (IB-MSO) to the Integrative Biology Ph.D. Program with an attached memo from Rod Murphey, Program Director.

Under the "Consult and list departments that might be affected by the change and attach comments" box, we are including the Department of Ocean and Mechanical Engineering.

Kindly send a letter of support or an email with your comments.

Thank you very much for your time and attention.

Regards,

Michelle Cavallo

On behalf of
Rod Murphey, Professor and Chairman
Director, Integrative Biology Doctoral Program

Michelle Cavallo
Administrative Assistant & Graduate Coordinator
Department of Biological Sciences
Florida Atlantic University
777 Glades Road
Boca Raton, FL 33431
PH: 561-297-0384