Biological Sciences

Joel C. Trexler, Professor and Chairperson
Christopher Baraloto, Professor and Director of the ICTB and the Division of Land and Biodiversity and Associate Director of the Institute of Environment
M. Alejandro Barbieri, Professor
Ana Paula Benaduce, Instructor
Bradley C. Bennett, Professor
Kevin Boswell, Associate Professor
Heather D. Bracken-Grissom, Associate Professor
Lisa Brinn, University Instructor
Richard P. Brinn, University Lecturer
Justin E. Campbell, Assistant Professor
Alessandro Catenazzi, Assistant Professor
Demian Chapman, Associate Professor
Ligia Collado-Vides, University Lecturer and Associate Chair
Laurel S. Collins, Professor
Timothy M. Collins, Professor and Graduate Program Director
Christian Cox, Assistant Professor
John Cozza, Senior Instructor
Todd Crowd, Professor and Director, Institute of Environment
Matthew DeGennaro, Assistant Professor
Maureen A. Donnelly, Professor and Associate Dean for Graduate Studies, Colleges of Arts, Sciences and Education
Sarah Eddy, Assistant Professor
Jose Maria Eirin-Lopez, Associate Professor
Sian Evans, Senior Instructor
James W. Fourquarean, Professor and Director of the Division of Coastlines and Oceans and Associate Director of the Institute of Environment
Javier Francisco-Ortega, Professor
Evelyn E. Gaiser, Professor and George M. Barley Jr. Endowed Chair of Everglades Research
Daniel Gann, Assistant Professor
Miroslav Gantar, Senior Instructor
Sat Gavassa, Senior Instructor
John Geiger, Instructor
Camila Granados-Cifuentes, Instructor
Alastair Harborne, Assistant Professor
Michael Heithaus, Professor and Dean, College of Arts, Sciences and Education
Lou Kim, Associate Professor and Director of Undergraduate Studies
Jeremy Kiszka, Assistant Professor
John S. Kominoski, Associate Professor
Suzanne Koptur, Professor
Lidia Kos, Professor and Associate Dean, University Graduate School and Associate Vice President, Research and Economic Development
Marcy Kravec, Senior Lecturer and Associate Director for Faculty Leadership and Success, Office of the Provost
Alexis Lainoff, Instructor
Jun Li, Associate Professor
Jessica Liberles, Assistant Professor
Sparkle Malone, Assistant Professor
Jaime Mayoral, Instructor Laboratory Coordinator
Melissa McCarty, Assistant Professor
DeEtta K. Mills, Associate Professor and Director, IFRI
Fernando G. Noriega, Professor
Steven F. Oberbauer, Professor
Yannis Papastamatiou, Assistant Professor
Thomas R. Pitzer, University Lecturer Laboratory Coordinator
Adam Roddy, Assistant Professor
Mauricio Rodriguez-Lanetty, Associate Professor
Maria Jose Rodriguez Mora, Senior Instructor
Karla Rivera-Caceres, Instructor
Diego Salazar, Assistant Professor
Helena Schmidt Mayerova, Senior Instructor
Laura Serbus, Assistant Professor
Paul R. Sharp, Senior Instructor
Philip K. Stoddard, Professor
Jamie Theobald, Associate Professor
Oscar Valverde-Barrantes, Assistant Professor
Maureen Walter, University Lecturer
Jeffrey D. Wells, Associate Professor
Yuying Zhang, Associate Professor

Bachelor of Arts in Biological Sciences

Degree Program Hours: 120

Courses Required for the Degree

Lower Division Program

Common Prerequisite Courses and Equivalencies

<table>
<thead>
<tr>
<th>FIU Course(s)</th>
<th>Equivalent Course(s)</th>
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<tbody>
<tr>
<td>BSC 2010, BSC 2010L</td>
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<td>STAX02 or STAX04 or STAX321 or STA 3193 or MAC X234</td>
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</table>

Courses which form part of the statewide articulation between the State University System and the Florida College System will fulfill the Lower Division Common Prerequisites.

Please visit [https://cpm.flvc.org](https://cpm.flvc.org) for a current list of state-approved common prerequisites.

Required Courses

Courses Required for the Degree:

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<tr>
<th>courses</th>
<th>Equivalent course(s)</th>
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<tbody>
<tr>
<td>BSC 1005</td>
<td>Essentials of Biology: The Big Picture</td>
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<tr>
<td>BSC 1000</td>
<td>Local and Global Perspectives in Biology – GL</td>
</tr>
<tr>
<td>BCH 2020</td>
<td>Foundations of Biochemistry</td>
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</table>
BSC 2300 Biological Organization: The Size and Scale of Life 3

OTHER DEGREE REQUIREMENTS: 60 credits

Upper Division Core Requirements – 10 credits
PCB 3043 Ecology 3
PCB 3063 Genetics 3
PCB 4674 Evolution 3
BSC 4931 Senior Seminar 1

Upper Division Biology Electives – 21 credits
Students must complete 7 lecture courses from the acceptable Upper Division Biology Electives maintained by the Biology Department. One lecture course must be chosen in each of the following areas:
A. Ecology
B. Organismal Diversity
C. Physiology/Biochemistry
D. Structure/Development

The remaining 4 lecture courses may be chosen at the student's discretion from courses in any of the distribution areas (the distribution area is designated by the letter in brackets after the course description). The following courses are not allowed as Biology Electives: Essentials of Biology: The Big Picture (BSC 1005), Foundations of Biochemistry (BCH 2020), Biological Organization: The Size and Scale of Life (BSC 2300), Student Research Labs (BSC 3915, 4914, and 6916); Workshop Biology Labs (BSC 5928, PCB 5238, BSC 6926, etc.); Cooperative Education credits (BSC 3949); Biology of Women (BSC 3027); Research Methods in Biological Sciences (BSC 3910); and courses for non-science majors (BOT 1010, PCB 2061, PCB 2099, MCB 2000, BSC 2023, EVR 3013, OCB 2000, and OCE 3014).

Biology Laboratory Requirements – 3 credits
3 Upper Division Labs

Track Specific Courses – 18 credits
Six courses in the specified track must be completed.

Allied Health Profession Track
ANT 3462 Medical Anthropology 3
ANT4480 Anthropological Approaches to Global Health 3
APK 3110 Exercise Physiology 3
CLP 4146 Abnormal Psychology 3
DEP 2000 Human Growth and Development: Introductory Developmental Psychology 3
ECO 4504 Intro to Public Finance 3
HIS 4492 History of U.S. Health Policy 3
PAD 3034 Policy Development and Implementation 3
PGB 3703 Human Physiology I 3
PGB 3703L Human Physiology I Lab 1
POS 3424 The Legislative Process 3
HSC 3537 Medical Terminology 3
HSC 3549 Clinical Physiology for Health Professionals 3
HSC 4553 Fundamentals of Pathology 3
HUN 2202 Principles of Nutrition 3
PET 3310 Kinesiology 3
PSY 2012 Introductory Psychology 3
ZOO 3731 Human Anatomy 3
ZOO 3731L Human Anatomy Demonstration 1

Health Policy, Environmental Policy and Pre-Law Track
AMH 3630 Environmental History of the United States 3
CJL 3512 The Courts 3
CJL 4064 Criminal Justice and the Constitution 3
COM 4462 Conflict Management 3
ECP 3302 Introduction to Environmental Economics 3
ENC 3311 Advanced Writing and Research 3
ENC 3354 Writing as Social Action 3
ENC 3371 Rhetorical Theory and Practice 3
ENC 4331 Writing, Rhetoric, and Community 3
ENC 4930 Special Topics in Composition 3
GEO 4354 Geography of the Global Food System 3
INR 4350 International Environmental Politics (IP) 3
PAD 3034 Policy Development and Implementation - GL 3
PHI 2100 Introduction to Logic 3
PHI 2103 Critical Thinking 3
PHI 4130 Symbolic Logic 3
POS 3283 The Judicial Process 3
POS 3603 Constitutional Law: Powers 3
POS 3604 Constitutional Law: Limitations 3
POS 4784 Analytic Writing in Political Science 3
REL 3492 Earth Ethics 3
SPC 3230 Rhetorical Communication: A Theory of Civil Discourse 3
SPC 3540 Persuasion 3

Science Communication Track
COM 3110 Business and Professional Communication 3
ENC 3213 Professional and Technical Writing 3
ENC 3311 Advanced Writing and Research 3
ENC 3363 Writing About the Environment 3
ENC 3416 Writing and New Media 3
ENC 4241 Scientific Writing 3
ENC 4260 Advanced Professional Writing 3
ENC 4357 How To Go Public 3
IDS 3309 How We Know What We Know – GL 3
MMC 3121 Writing Fundamentals for Communicators 3
MMC 3650 Media and Sustainability 3
MMC 4936 Special Topics 3
JOU 3314 Environmental Journalism: Communicating Environmental Issues in South Florida 3

Bioentrepreneur Track
ACG 3024 Introduction to Accounting for Managers and Investors (AC) 3
FIN 3005 Introduction to Business Finance 3
ISM 3012 Introduction to Decision and Information Systems (IS) 3
MAN 3022 Introduction to Management 3
MAR 3024 Marketing Fundamentals (ME) 3

Choose one of the following:
COM 3110 Business and Professional Communication 3
HAS 3111 Introduction to Health Services Systems 3

General Electives – 8 credits
Eight additional credits must be completed.
Bachelor of Science in Biological Sciences

Degree Program Hours: 120

Courses Required for the Degree

Lower Division Program

Common Prerequisite Courses and Equivalencies

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<td>STAX023 or STAX024 or STAX321**</td>
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Courses which form part of the statewide articulation between the State University System and the Florida College System will fulfill the Lower Division Common Prerequisites.

Please visit https://cpm.flvc.org for a current list of state-approved common prerequisites.

Common Prerequisites

A grade of "C" or better required

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<tbody>
<tr>
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<td>General Biology I</td>
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<td>CHM 2211</td>
<td>Organic Chemistry II</td>
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MAC 2311 \(\equiv\) Calculus I

MAC 2312 \(\equiv\) Calculus II

OR

<table>
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<th>Description</th>
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<tr>
<td>STA 2122</td>
<td>Stats for Behav Sci I</td>
</tr>
<tr>
<td>STA 3123</td>
<td>Stats for Behav Sci II</td>
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</table>

1. Organic chemistry sequence or physics sequence must be taken at the Lower Division.
2. Physics without Calculus I and II and corresponding labs can be substituted (PHY 2053 and PHY 2054).
3. Calculus I and Calculus II must be taken at the Lower Division. If Statistics I is taken, it must be taken in the Lower Division.

- FIU does not accept MAC 2233 (Calculus for Business) as a substitute for MAC 2311 (Calculus I).
- **Calculus I and Statistics I alone are not sufficient to meet the requirements for the degree. STA 3111 and STA 3112 may be substituted for STA 2122 and STA 3123.

- Students admitted to the university are admitted directly to their chosen major. Students are expected to make good progress based on critical indicators, such as GPA in specific courses or credits earned. In cases where students are not making good progress, a change of major may be required. Advisors work to redirect students to more appropriate majors when critical indicators are not met.

Upper Division Program

Required Courses

1. PCB 3043 Ecology 3
2. PCB 3063 Genetics 3
3. PCB 4023 Cell Biology 3
4. PCB 4674 Evolution 3
5. BSC 4931 Senior Seminar 1
6. Distribution Requirement 12

One additional lecture course in each of the following areas:

- A. Ecology
- B. Organismal Diversity
- C. Physiology/Biochemistry
- D. Structure/Development

(If a course satisfies the distribution requirement, the letter of the area that it satisfies is in brackets after the course description).

7. Biology Electives 12 lecture courses
8. Laboratory Requirement 4 (Four Labs, regardless of credits per lab)
9. Electives outside major 9
10. A minimum of 48 credits must be earned in Upper Division courses.

**Two upper division lecture courses (3000-level and above) to be chosen in consultation with a faculty advisor. The following courses are not allowed as Biology Electives: Essentials of Biology: The Big Picture (BSC 1005), Foundations of Biochemistry (BCH 2020), Biological Organization: The Size and Scale of Life (BSC 2300), Student Research Labs (BSC 3915, 4914, and...
Bachelor of Science in Biological Sciences: Quantifying Biology in the Classroom (QBIC) Track

Degree Program Hours: 120

Courses Required for the Degree

Lower Division Program

Common Prerequisite Courses and Equivalencies

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Common Prerequisites

A grade of "C" or better required

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<tr>
<td>MAC 2312</td>
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</tbody>
</table>

1Organic chemistry sequence or physics sequence must be taken at the Lower Division.

2Statistics I and II are upper division but taken during the Sophomore Year and coordinated with Ecology and Genetics labs.

For consideration for QBIC track admission entering freshman must have >3.3 GPA (unweighted), >1750 SAT with MATH >600, have completed Precalculus Math (or Algebra and Trigonometry) and have an interest in pursuing graduate studies (MD, DVM, DDS, PhD, MD/PhD). Transfer and continuing FIU students can apply on a space available basis if they have maintained >3.3 GPA in college-level work and have completed Calculus I with a grade above ‘B’. QBIC students are required to maintain cumulative GPA above 3.0.

Upper Division Program

Required Courses

1. PCB 3043 
   Ecology 
   3
2. PCB 3063 
   Genetics 
   3
3. PCB 4023 
   Cell Biology 
   3
4. PCB 4674 
   Evolution 
   3
5. BSC 4927 
   QBIC Science Café 
   1
6. Distribution Requirement
   12

One additional lecture course in each of the following areas:

A. Ecology
B. Organismal Diversity
C. Physiology/Biochemistry
D. Structure/Development

(If a course satisfies the distribution requirement, the letter of the area that it satisfies is in brackets after the course description).

7. QBIC Required Corequisites

<table>
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<tbody>
<tr>
<td>BSC 3923</td>
<td>QBIC Ecology Journal Club</td>
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<tr>
<td>BSC 3924</td>
<td>QBIC Genetics Journal Club</td>
</tr>
<tr>
<td>BSC 4925</td>
<td>QBIC Cell Biology Journal Club</td>
</tr>
<tr>
<td>BSC 4926</td>
<td>QBIC Evolution Journal Club</td>
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</table>

8. Biology Electives: 1 lecture courses

9. Laboratory Requirement
   (QBIC sections of PCB 3043L, PCB 3063L, PCB 4023L, and another lab accompanying an upper division lecture elective of choice)
10. Electives outside major 9 (Modeling+Simulation and Higher Math courses are recommended)
11. A minimum of 48 credits must be earned in Upper Division courses.

1Lecture courses (3000-level and above) to be chosen in consultation with a faculty advisor. Journal Club courses count as one elective and are corequisites to PCB 3043, PCB 3063, PCB 4023 and PCB 4674. The following courses are not allowed as Biology Elective: Essentials of Biology: The Big Picture (BSC 1005), Foundations of Biochemistry (BCH 2020), Biological Organization: The Size and Scale of Life (BSC 2300), Student Research Labs (BSC 3915, 4914, and 6916): Workshop Biology Labs (BSC 5928, PCB 5238, BSC 6926, etc.); Cooperative Education credits (BSC 3949): Biology of Women (BSC 3027); Research Methods in Biological Sciences (BSC 3910); and courses for non-science majors (BOT 1010, PCB 2061, PCB 2099, MCB 2000, EVR 3013, OCB 2000, and OCE 3014).

2Laboratory requirement is met with any upper division Biology labs offered with the required courses, courses that meet the distribution or Biology elective requirements.

**Bachelor of Science in Biological Sciences: Forensic Biomolecular Biology (FBB) Track**

**Degree Program Hours: 120**

**Courses Required for the Degree**

**Lower Division Program**

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**Common Prerequisites**

A grade of "C" or better required

- BSC 2010 General Biology I
- BSC 2010L General Biology I Lab
- BSC 2011 General Biology II
- BSC 2011L General Biology II Lab
- CHM 1045 General Chemistry I
- CHM 1045L General Chemistry I Lab
- CHM 1046 General Chemistry II
- CHM 1046L General Chemistry II Lab
- CHM 2210 Organic Chemistry I
- CHM 2210L Organic Chemistry I Lab
- CHM 2211 Organic Chemistry II
- CHM 2211L Organic Chemistry II Lab
- PHY 2048 Physics with Calculus I
- PHY 2048L General Physics Lab I
- PHY 2049 Physics with Calculus II
- PHY 2049L General Physics Lab II
- MAC 2311 Calculus I
- MAC 2312 Calculus II

**Upper Division Program**

**Required Courses**

1. PCB 3043 Ecology 3
2. PCB 3063 Genetics 3
3. PCB 4023 Cell Biology 3
4. PCB 4674 Evolution 3
5. BSC 4931 Senior Seminar 1
6. Distribution Requirement 12

One additional lecture course in each of the following areas:

A. Ecology
B. Organismal Diversity
C. Physiology/Biochemistry
D. Structure/Development

(If a course satisfies the distribution requirement, the letter of the area that it satisfies is in brackets after the course description).

**Required FBB Courses apply to above distribution**

- BSC 3400 Wildlife Conservation, Forensic and Crime Science (B) 3
- BSC 4401 Principles of Forensic Biology (D) 3
- BCH 3303 General Biochemistry (C) 3
- BSC 3905 Internship (1 required) 0-4

(Minimum 30 hours required for course)

7. Biology Electives 1 2 lecture courses 6

**Suggested electives to fulfill above requirement**

- ENV 4060 Entomology (3) & Entomology Lab (1)
- PCB 4553 General Population Genetics (GL)(A) 3

8. Laboratory Requirement 4
Required FBB Courses and Biology electives apply to Laboratory Requirement

BSC 4401L Principles of Forensic Biology Lab 1
BCH 3303L General Biochemistry Lab 1
ENY 4060L Entomology Lab 1
PCB 3043L Genetics Lab 1

9. Electives outside major 9

10. A minimum of 45 credits must be earned in Upper Division courses.

Two upper division lecture courses (3000-level and above) to be chosen in consultation with a faculty advisor. The following courses are not allowed as Biology Electives: Essentials of Biology: The Big Picture (BSC 1005), Foundations of Biochemistry (BCH 2020), Biological Organization: The Size and Scale of Life (BSC 2300), Student Research Labs (BSC 3915, 4914, and 6916); Workshop Biology Labs (BSC 5928, PCB 5238, BCH 6926, etc.); Cooperative Education credits (BSC 3949); Biological Oceanography (BSC 3032); Research Methods in Biological Sciences (BSC 3910); and courses for nonscience majors (BOT 1010, PCB 2061, PCB 2099, MCB 2000, EVR 3013, OCB 2003, and OCE 3014).

Special Programs

Bachelor of Science in Marine Biology

Admission to the Program

Students wishing to pursue the BS in Marine Biology must meet the same entry requirements as identified for admission to the BS in Biological Sciences. Marine Biology Program activities and upper-division coursework will be concentrated at the Biscayne Bay Campus, although some course requirements may be met elsewhere at FIU.

Continuity in academic advisement is an objective in this specialized degree program. Students in the BS Marine Biology Program will be advised by a dedicated Marine Biology Advising Office. Faculty in Biological Sciences, including Marine Biology faculty, are available to provide academic and career advice for students in the Marine Biology Program.

Common Prerequisite Courses and Equivalencies

<table>
<thead>
<tr>
<th>FIU Course(s)</th>
<th>Equivalent Course(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSC 2010, BSC 2010L</td>
<td>BSCX010/X010L or BSCX010C or BSCX040/X040L or PCBX011C</td>
</tr>
<tr>
<td>BSC 2011, BSC 2011L</td>
<td>BSCX011/X011L or BSCX011C or BSCX041/X041L or CHMX045/X045L or CHMX045C or CHMX040 and CHMX041</td>
</tr>
<tr>
<td>CHM 1045, CHM 1045L</td>
<td>CHMX046/X046L or CHMX046C</td>
</tr>
<tr>
<td>CHM 1046, CHM 1046L</td>
<td>CHMX210/X210L or CHMX210C1</td>
</tr>
<tr>
<td>CHM 2210, CHM 2210L</td>
<td>CHMX211/X211L or CHMX211C1</td>
</tr>
<tr>
<td>PHY 2048, PHY 2048L</td>
<td>PHYX048/X048L or PHYX053/X053L</td>
</tr>
<tr>
<td>PHY 2049, PHY 2049L</td>
<td>PHYX049/X049L or PHYX054/X054L</td>
</tr>
<tr>
<td>MAC 2311</td>
<td>MACX311 or MACX233 or MACX253 or MACX081 or MACX241</td>
</tr>
<tr>
<td>MAC 2312 or STA 2122 and STA 3123</td>
<td>MACX312 or MACX282 or MACX234 or STAX023 or STAX024 or STAX321*</td>
</tr>
</tbody>
</table>

Courses which form part of the statewide articulation between the State University System and the Florida College System will fulfill the Lower Division Common Prerequisites.

Please visit https://cpm.flvc.org for a current list of state-approved common prerequisites.

Courses Required for the Degree

Lower Division Program

The lower division component of the Marine Biology Bachelor of Science is similar to that of the BS in Biological Sciences, in which common prerequisites in Biological Sciences, Chemistry1, Physics, Calculus, and Statistics must be met. All requirements for completion of the lower division in Biological Sciences apply to the BS in Marine Biology, including the grade of “C” or better in required courses, the lower division physics, calculus, and statistics requirements, options, and acceptable substitutions.

1 Organic chemistry sequence may be fulfilled by taking CHM 2210, CHM 2210L (lecture and lab) and CHM 2211, CHM 2211L (lecture and lab) or CHM 2220, CHM 2220L (Survey of Organic Chemistry lecture and lab) and CHM3120, CHM3120L (Introduction to Analytical Chemistry lecture and lab) and CHS 4600 Marine Chemistry

Other Degree Requirements

All freshman and first-year transfer students entering the Marine Biology major are required to complete a one-semester course introducing the degree program2

2 OCB 1930 Marine Biology at FIU

Upper Division Program

The upper-division requirements for the BS in Marine Biology include a selection of six common requirements, one required laboratory, and a choice of four marine electives, including selections from among the physical sciences. The Marine Biology Distribution Requirement provides for disciplinary breadth in Marine Biology electives.

Common Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Requirement</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCB 3043</td>
<td>Ecology</td>
<td>3</td>
</tr>
<tr>
<td>PCB 3063</td>
<td>Genetics</td>
<td>3</td>
</tr>
<tr>
<td>PCB 4674</td>
<td>Evolution</td>
<td>3</td>
</tr>
<tr>
<td>OCB 3043</td>
<td>Marine Biology and Oceanography</td>
<td>3</td>
</tr>
<tr>
<td>OCB 3043L</td>
<td>Marine Biology and Oceanography Lab</td>
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</tr>
<tr>
<td>OCP 3002</td>
<td>Physical Oceanography</td>
<td>3</td>
</tr>
<tr>
<td>BSC 4931</td>
<td>Senior Seminar</td>
<td>1</td>
</tr>
</tbody>
</table>

Upper-Division Electives
Students are required to choose at least 15 credits spread among the following four areas. At least 1 class per area (A,B,C,D) needs to be taken plus one additional class from any of the four categories for a total of 15 credits.

Requirement (A): Biology and Physiology of Marine Organisms; Requirement (B): Marine Ecology and Conservation Biology; Requirement (C): Field Marine Biology Experience; Requirement (D): Marine Molecular Biology:

(A) Biology and Physiology of Marine Organisms
1. Invertebrate Zoology ZOO 3205C (4)
2. Marine Botany BOT 4402C (4); Phycology BOT 4404 (3)
3. Biology of Marine Mammals OCB 4303 (3)
4. Marine Microbial Ecology OCB 4632 (3)
5. Fish Biology ZOO 4454 (3)
6. Animal Physiology PCB 4723 (3) or Comparative Physiology PCB 4724 (3) or Physiological and Behavioral Ecology of Marine Animals PCB 4776 (3)

(B) Marine Ecology and Conservation Biology
1. Coastal Marine Conservation OCB 4070 (3)
2. Coral Reef Biology OCB 3264
3. Marine Community Ecology OCB 4633 (3)
4. Fisheries Science OCB 4711 (3)
5. Marine Protected Areas PCB 4467C (4)

(C) Field Marine Biology Experience
1. Field Methods in Marine Ecology OCB 4104C (4)
2. Biological Oceanography at Sea I or II OCB 4004 (3) or OCB 4005C (4)
3. Scientific Diving BSC 4473C* (3) (*does not count as a lab).
4. Student Research Lab I BSC 3915 (3) Independent study with a Marine Biology faculty member, requires permission of Marine Biology Director
5. Honors Research Lab BSC 4970 (3), requires permission of Marine Biology Director

(D) Marine Molecular Biology
1. Cell Biology PCB 4023 (3)
2. Molecular Biology PCB 4524 (3)
3. Bioinformatics for Biologists BSC 4434 (3)
4. Immunology PCB 4233 (3)
5. Population Genetics PCB 4553 (3)

Laboratory Requirement
The student is required to take OCB 3043L Marine Biology and Oceanography Lab, plus 3 laboratories of upper division required or elective courses.

Bachelor of Science with Honors in Biology or Marine Biology

Admission to the Program
1. Permission of the department. Application should be made by letter to the Honors Committee from the applicant after completion of two semesters at the University and prior to two semesters before graduation. The letter should state the intended research problem and be countersigned by the Thesis Committee (advisor and mentor).
2. A minimum GPA of 3.5 in biology, chemistry, physics, geology, and mathematics courses.

Graduation Requirements
1. A minimum GPA of 3.5 in biology, chemistry, physics, geology, and mathematics courses.
2. Completion of the BS requirements in Biology or Marine Biology, and Honors Research Lab (BSC 4915L, 1 to 3 credits, and Honors Thesis (BSC 4970, 3 credits).
3. Completion of Honors research in collaboration with a two-person Honors Committee, consisting of the honors advisor and one other member. The honors advisor must be a tenured or tenure-earning member of the department. The research results must be written in the form of an honors thesis and approved by the Honors Committee.
4. Deposit two completed approved copies of the Honors Thesis with the Department's Office: one copy to be kept in the department and the other to be deposited in the Library.
5. Presentation of the results of the Honors Research in a departmental seminar.

Bachelor of Science in Biological Sciences: Biology Education Major (FIUteach)

This program prepares students interested in biology careers and certification to teach biology. Additional science and/or mathematic certifications at the secondary level may be added (below). Students are encouraged to contact the FIUteach program (FIUteach.fiu.edu) for opportunities to try out teaching at no cost. Interested students are encouraged to contact the department, the FIUteach program, or the secondary science advisor for additional details and certification requirements.

Additional coursework in science and/or mathematics is required to prepare for certification in additional subject areas. Students must contact the FIUteach program or the secondary science advisor for details and requirements.

Admission to the Program
To qualify for admission to the program, undergraduate candidates must have met all of the lower division requirements including: 60 credit hours of lower-division courses, all general education requirements, lower division GPA of 2.5 higher, and achieve the competencies of the FTCE General Knowledge Exam (GK). All students must pass the GK Exam by the time they reach 72 credit hours in their program of study. All stated admission requirements are to be considered minimum. A student who meets these minimum requirements is not automatically assured admission. Program admission requirements are subject to change. It is the responsibility of the student to assure that he/she has met the requirements.

Lower Division Requirements
Common Prerequisites
A grade of "C" or better required

BSC 2010  General Biology I
BSC 2010L General Biology I Lab
BSC 2011  General Biology II
BSC 2011L General Biology II Lab
CHM 1045  General Chemistry I
CHM 1045L General Chemistry I Lab
CHM 1046  General Chemistry II
CHM 1046L General Chemistry II Lab
CHM 2210  Organic Chemistry I
CHM 2210L Organic Chemistry I Lab
CHM 2211  Organic Chemistry II
CHM 2211L Organic Chemistry II Lab

PHY 2048  Physics with Calculus I\(^1,2\)
PHY 2048L General Physics Lab I\(^1,2\)
PHY 2049  Physics with Calculus II\(^1,2\)
PHY 2049L General Physics Lab II\(^1,2\)

MAC 2311  Calculus I\(^3\)
MAC 2312  Calculus II\(^3\)

OR

STA 2122  Stats for Behav Scien I\(^3\)
STA 3123  Stats for Behav Scien II\(^3\)

\(^1\)Organic Chemistry sequence or Physics sequence must be taken at the Lower Division.

\(^2\)Physics without Calculus I and II (PHY 2053 and PHY 2054) can be substituted Physics with Calculus I and II.

\(^3\)Calculus I and II must be taken at the Lower Division. If Statistics I is taken it must be taken at the lower division. Both Statistics I and II are required to replace Calculus II only. STA 3111 and STA 3112 may be substituted for STA 2122 and STA 3123.

Additional Lower Division Courses: (2 credits)

SMT 2661  Step 1: Inquiry Approaches to Teaching Mathematics and Science 1
SMT 2662  Step 2: Inquiry-Based Lesson Design in Mathematics and Science 1
SMT 2044  Combined STEP 1 & 2: Inquiry-Based Approaches and Lesson Design for Teaching Mathematics and Science 2

Upper Division Biology Education Program

Required Courses
PCB 3043 Ecology 3
PCB 3063 Genetics 3
PCB 4023 Cell Biology 3
PCB 4674 Evolution 3
BSC 4931 Senior Seminar 1

Biology Education Upper Division Electives
Select one course each of the following areas:

A. Ecology 3
B. Organismal Diversity 3
C. Physiology/Biochemistry 3
D. Structure/Development 3

(If a course satisfies the distribution requirement, the letter of the area it satisfies is in brackets after the course description)

Biology Laboratory Requirement
One Upper Division Lab 1

Education Requirements

BSC 3910 Research Methods in Biological Sciences 3
SMT 3100 Knowing and Learning in Mathematics and Science 3
SMT 4301 Classroom Interactions in Mathematics and Science Teaching 3
SMT 4664 Problem-Based Instruction (PBI) in Mathematics and Science 3
SCE 4194 Perspectives in Science and Math Education – GL 3
SCE 4944 Student Teaching 6
RED 4325 Subject Area Reading 3
TSL 4324 ESOL Issues and Strategies for Content Area Teachers – GL 3

Minor in Biology

Required Courses

BSC 2010 and BSC 2011 with labs, and one upper division course (3000-level or above) in three of the following areas: A. Ecology, B. Organismal Diversity, C. Physiology/Biochemistry, or D. Structure/Development.

One of these elective courses must be at the 4000-level or higher and one must include a lab. Total upper division biology credits must number 10 or more. Grades of ‘C’ or better are required for all courses and labs. The following courses do not count as electives: Student Research Labs (BSC 3915, 4914, and 6916), Biological Sciences Research Internship (BSC 3941), Workshop Biology Labs (BSC 5928, PCB 5238, BSC 6926, etc.); Cooperative Education credits (BSC 3949), and any course for non-science majors (e.g., EVR 3013 and OCE 3014). Students obtaining a BS in Marine Biology wishing to obtain a minor in Biology must take three electives and one upper division lab different from those used to satisfy the BS in Marine Biology. Students obtaining a Bachelor degree in a major other than Biology or Marine Biology wishing to obtain both Biology and Marine Biology minors must use different upper division courses for each of the two minors.

Minor in Marine Biology

Required Courses

Students must complete, with a grade of “C” or better, BSC 2010 and BSC 2011 with labs, OCB 3043 Marine Biology and Oceanography and OCB 3043L, and at least two courses from among the selection of upper-division Marine Electives that meet the BS in Marine Biology requirement. One of these elective courses must be at the 4000-level or higher. Total upper division biology credits must number 10 or more. The following courses do not count as electives: Student Research Labs (BSC 3915, 4914, and 6916), Biological Sciences Research Internship (BSC 3941), Workshop Biology Labs (BSC 5928, PCB 5238, BSC 6926, etc.); Cooperative Education credits (BSC 3949), and any course for non-science majors (e.g., EVR 3013 and OCE 3014). Students obtaining a BS or BA in Biology wishing to obtain a Minor in Marine Biology must take three electives and one upper division lab different from those used to satisfy the BS or BA in Biology. Students obtaining a Bachelor degree in a major...
other than Biology or Marine Biology wishing to obtain both Biology and Marine Biology minors must use different upper division courses for each of the two minors.

Pre-Medical, Dental, Optometry, and Veterinary Curricula

Students who have fulfilled the requirements for the BS in Biology will also have satisfied the course requirements for admission to the above mentioned professional schools. Some professional schools may have additional course requirements. Interested students should consult the Pre-Medical Advisor for arranging a curriculum to enhance their potential to gain admission.

Course Descriptions

Note: Laboratories should be taken concurrently with or subsequent to lectures. Students should register for each separately.

Definition of Prefixes

BCH - Biochemistry; BOT - Botany; BSC - Biological Science; ENY - Entomology; IDS-Interdisciplinary Studies; MCB - Microbiology; OCB - Oceanography (Biological); PCB - Process Biology; SCE - Science Education; ZOO – Zoology

Courses that meet the University’s Global Learning requirement are identified as GL.

BCH 2020 Foundations of Biochemistry (3). An introduction to the fundamentals of biochemistry which explores the interactions of macromolecules in cells and their environment, and the metabolic pathways that govern life. Prerequisites: BSC 2010, CHM 1045

BCH 3033 General Biochemistry (3). BCH 3033L Biochemistry Lab (1). Chemistry of proteins, lipids, carbohydrates, and nucleic acids; principles of enzymology, metabolism, and bioenergetics. Prerequisites (Lecture): CHM 2211 and BSC 2010. Prerequisite or Corequisite: BCH 3033 [C]

BOT 1010 Introductory Botany (3). BOT 1010L Introductory Botany Lab (1). A history of mankind’s study and use of plants, and a survey of plants of economic importance. Includes lab. No science prerequisite. (Lab fees assessed)

BOT 3014 Plant Life Histories (3). BOT 3014L Plant Life Histories Laboratory (1). Plant form, function, and reproduction: the lives of algae, fungi, bryophytes, ferns, gymnosperms, and flowering plants. This course is designed for majors and certificate students. Prerequisite (Lecture): BSC 2011. Prerequisite or Corequisite: (lab) BOT 3014 [B]


BOT 3353 Morphology of Vascular Plants (3). BOT 3353L Morphology of Vascular Plants Lab (1). Origin and evolution of plants, especially vascular plants of tropical origin. Analysis of vascular plant anatomy and morphology, emphasizing the underlying principles of plant construction. Prerequisites (Lecture): A course in General Biology or permission of the instructor. Prerequisite or Corequisite (Lab): BOT 3353. [D]

BOT 3434 Mycology (3). BOT 3434L Mycology Lab (1). An introduction to the taxonomy, genetics, and physiology of fungi with special emphasis on commercially important fungi and plant and animal pathogenic fungi. Prerequisites (Lecture): BSC 2010, BSC 2101. Prerequisites or Corequisites: BOT 3434 [B]

BOT 3663 Tropical Botany (3). BOT 3663L Tropical Botany Lab (1). How environmental factors affect the distribution of vegetation, and the morphology and physiology of plants in the tropics. Emphasis on tropical plants of economic importance. Prerequisites (Lecture): BSC 2011 or equivalent. Prerequisites or Corequisites: BOT 3663. [B]

BOT 3810 Economic Botany (3). The origins, domestication and uses of economically important plants. Prerequisites: BSC 2011 or BOT 1010. [B]

BOT 4401 Plant Conservation Biology (3). Overview of the causes and consequences of local and global-scale human disturbances on plant diversity, including evaluation of strategies to mitigate these impacts. Prerequisite: PCB 3043. [A]

BOT 4402C Marine Botany (3-4). Introduction to the taxonomy, biology of seaweeds, seagrass and mangroves, including species identification in the field and lab. Prerequisites: BSC 2011 or equivalent. [B]

BOT 4404 Phycology (3). BOT 4404L Phycology Lab (1). The biology of marine and freshwater algae, with an emphasis on structure, function, reproduction, classification, and ecology. Prerequisites (Lecture): BSC 2010, BSC 2101. Prerequisites or Corequisites: BOT 4404. [B]

BOT 4503 Plant Physiology (3). Plant growth and metabolism in relationship to environment. Photobiology, nutrient relations, transport, and hormones in relation to plant development and function. Prerequisites: BSC 2010, BSC 2101L, BSC 2110, CHM 2210. [C]

BOT 4503L Plant Physiology Lab (1). Plant growth and metabolism in relationship to environment. Photobiology, nutrient relations, transport, and hormones in relation to plant development and function. Prerequisite or Corequisite: BOT 4503. [C]

BOT 4601 General Plant Ecology – GL (3). BOT 4601L General Plant Ecology Lab (1). An examination of the ecology of plants at the individual, population, and community levels. Prerequisites (Lecture): PCB 3043 or permission of the instructor. Prerequisite or Corequisite: BOT 4601. [A]
BOT 4684 Taxonomy of Tropical Plants (3). BOT 4684L Taxonomy of Tropical Plants Lab (1). Introduction to higher plant taxonomy, including nomenclature, modern systems of angiosperm classification, and angiosperm evolution. Emphasis on identification of tropical plant families and plants of economic importance. Prerequisites (Lecture): BOT 3154 or BOT 3663 or permission of the instructor. Prerequisites or Corequisites (Lab): BOT 4684.

BSC 1000 Local and global perspectives in biology – GL (3). Current biological topics will be explored through reading primary scientific literature, ensuring that students recognize real life applications and global repercussions of biological research.

BSC 1005 Essentials of Biology: The Big Picture (3). The class will explore the connections between the core concepts of biology and how they intertwine with economics, culture, history, human health and conservation.

BSC 2010 General Biology I (3). BSC 2010L General Biology I Lab (1). Biomolecules, cells, energy flow, genetics, and physiology. Science background or Biology major recommended. Concurrent registration in both lecture and laboratory is required. Prerequisite or Corequisite (Lab): BSC 2010. (Lab fees assessed)

BSC 2011 General Biology II (3). BSC 2011L General Biology Lab II (1). A survey of organismal biology with emphasis on botany and zoology. Science background or Biology major recommended. Concurrent registration in both lecture and laboratory is required. Prerequisite or Corequisite: BSC 2011L. (Lab fees assessed)

BSC 2023 Human Biology (3). BSC 2023L Human Biology Lab (1). Biological and general scientific principles governing human structure, function, health, and relationship to the planetary environment. For non-science majors. (Lab fees assessed)

BSC 2300 Biological Organization: The Size and Scale of Life (3). An introduction to the extraordinary range of size of cells and organisms, and the interactions of biomolecules that govern and constrain all life. Prerequisites: BSC2010 and CHM1045

BSC 2917 (1). CACHe Discovery 1: Research in Aquatic Ecosystems. Exploration of South Florida's aquatic ecosystems through hands-on research experiences and introduction to career opportunities in science.

BSC 2921 QBIC Journal Club I (1). Topics complement General Biology I Lecture (BSC 2010) and reinforce concepts QBIC students learn in that class through discussion of relevant scientific literature. Corequisite: BSC 2010.

BSC 2922 QBIC Journal Club II (1). Topics complement General Biology II Lecture (BSC 2011) and reinforces concepts QBIC students learn in that class through discussion of relevant scientific literature. Corequisite: BSC 2011.

BSC 3027 Biology of Women (3). Consideration of women's bodies: how they work, how they have been regarded over time, and how biology affects abilities, health, and self-esteem. Course does not count as a biology or marine biology major elective.

BSC 3392 Science Concept Mapping: Biological Sciences (1). An introduction to the process of concept mapping and its application to the Biological Sciences. Topics include those included in standardized exams such as the MCAT and DAT. Prerequisites: BSC 2010 and BSC 2011.


BSC 3466L Make Your Mutant (1). Mutating existing proteins to study their structure/function relationship in their relation to health and disease. Good preparation for going into biotech, biomedical and biopharma fields. Corequisite: PCB 3063 or BCH 3033

BSC 3812 Biology Teacher Examination Preparation (0). A review of the main principles in Biology and the scientific process. Prerequisites: BSC 2010, BSC 2011.

BSC 3905 Biological Sciences Research Internship (0-12). Supervised, practical experience in a professional, laboratory or field setting in which biologists may work. Department permission is required. May be repeated. Prerequisites: Permission from FIU faculty advisor is required.

BSC 3910 Research Methods in Biological Sciences (3). Experimental development and design for future biology teachers. Independent biological sciences experiments are designed, conducted and analyzed. Includes statistical analysis techniques. Prerequisite: SMT 2662.

BSC 3915, 4914 Student Research Lab I and II (1-12). Independent laboratory study in a project or projects of the student’s choice. Registration by consultation with instructor. May be repeated for additional credit.


BSC 3924 QBIC Genetics Journal Club (1). A seminar styled course teaching QBIC students how to dissect and analyze complex analytically written scientific articles in Genetics (PCB 3063). Corequisite: PCB 3063.

BSC 3930 CACHe Discovery 2: Professional Pathways in Aquatic and Environmental Science (1). Explores the options for students to pursue careers and graduate work in STEM fields, through professional development training in resume building and improved written and oral communication skills.
BSC 3941 Biological Sciences Research Internship (0-12). Supervised, practical experience in a professional, laboratory or field setting in which biologists may work. Department permission is required. May be repeated. Prerequisites: Permission from FIU faculty advisor is required.

BSC 3949 Cooperative Education in Biology (1-3). A student majoring in biological sciences may spend several terms employed in industry or government in a capacity relating to the major. Prerequisites: Permission of Co-op Education and major department.

BSC 4205 Topics in Organismal Diversity (3). An intensive study of a topic or topics in organismal diversity not otherwise offered in the curriculum. Prerequisites: BSC 2010, BSC 2010L and BSC 2011, BSC 2011L. [B]

BSC 4303 Biogeography (3). Current issues concerning geographic distribution of plants and animals. Prerequisites: PCB 3043 and PCB 4674. [A]

BSC 4304 Environments of the Past (3). The biogeography, diversity and ecology of ancient life is combined with the study of sediments and stable isotopes to interpret environmental changes of the past at the local to global scale. [A]

BSC 4363 Biodiversity in the Caribbean Basin (3). Current issues on evolution, conservation, and diversification of biota of the Caribbean Basin. Prerequisites: BSC 2010, BSC 2011. [A]

BSC 4401 Principles of Forensic Biology (3). Molecular techniques used in forensic biology and how they, along with genetics, are used to generate a DNA profile in order to aid the administration of justice. Prerequisite: BSC 2010. [D]

BSC 4401L Principles of Forensic Biology Lab (1). Forensic Biology Lab will introduce students to lab techniques and processes that are commonly encountered in Molecular or Forensic labs such as Chain of Custody, Serology and DNA Analysis Prerequisites: PCB 3063 Corequisite: BSC 4401 or permission of instructor [D].

BSC 4422 Biotechnology: Applications in Industry, Agriculture and Medicine (3). Biological, biochemical, ecological, engineering, entrepreneurial, and ethical aspects of biotechnology in industry, agriculture, and medicine. [D]

BSC 4422L Biotechnology Laboratory (1). A laboratory course that is experiment-based in which students use biotechnology to explore such topics as recombinant DNA techniques, DNA sequencing, and tissue culture. Prerequisite or Corequisite: BSC 4422.

BSC 4434 Bioinformatics for Biologists (3). Introduction to bioinformatic resources/methods for biologists. Accessing, searching, retrieving and analyzing data, including sequence alignment, phylogenetic analysis, and structure prediction. Prerequisites: BSC 2010, BSC 2011, PCB 3063. [B]

BSC 4443 Functional Genomics and Proteomics (3). Introduction to the importance of functional genomics and proteomics in biological research. Prerequisite: PCB 3063. [C]

BSC 4473C Introduction to Scientific Diving (3). Covers all aspects of conducting safe underwater research, including theoretical and practical aspects of diving, diving equipment, and scientific techniques. Prerequisites: OCB 3043 lab or PCB 3043 lab or CHS 4600 or OCE 3014, open water diving certification, permission of the instructor, FIU Diving Medical clearance, pass standardized swim test, at least 18 years old.

BSC 4915L Honors Research (1-3). Laboratory and/or field study in consultation with an Honors Thesis advisor. Prerequisite: Admission into Honors in Biological Sciences Program.

BSC 4925 QBIC Cell Biology Journal Club (1). A seminar styled course teaching QBIC students how to dissect and analyze complex analytically written scientific articles in Cell Biology (PCB 4023).

BSC 4926 QBIC Evolution Journal Club (1). A seminar styled course teaching QBIC students how to dissect and analyze complex analytically written scientific articles in Evolution (PCB 4674).

BSC 4927 QBIC Science Café (1). QBIC students will develop and host their own Science Café to transmit scientific subjects to and engage in a dialog with the general public. Prerequisites: BSC 3923, BSC 3924, BSC 4925, BSC 4926.

BSC 4931 Senior Seminar (1). An exploration of various research works in biological sciences. Oral presentation by the students required. Prerequisite: Senior standing. Prerequisites or Corequisites: PCB 3043, PCB 3063, and PCB 4674, and PCB 4023 or BCH 2010, or OCP 3002.

BSC 4934 Topics in Biology (1-3). An intensive study of a particular topic or limited number of topics not otherwise offered in the curriculum.

BSC 4970 Honors Thesis (3). Writing an Honors Thesis. Prerequisite: BSC 4915L.

ENY 4060 Entomology (3). ENY 4060L Entomology Laboratory (1). Explorations of the morphology, physiology, behavior and metabolism of insects in the context of their evolutionary, environmental and economic significance. Prerequisites (Lecture): BSC 2010 and BSC 2011, or permission of the instructor. Prerequisite or Corequisite (Lab): ENY 4060. [B]

IDS 3214 Our Coastal Environment from the Bay to the World – GL (3). Natural science principles applied to the world's coastal and marine environments, with emphasis on human use of and interaction with those environments, using cases from Florida and around the globe.

MCB 2000 Introductory Microbiology – GL (3). MCB 2000L Introductory Micro Lab (1). Basic concepts of microbes as pathogens, food spoilage and fermentative organisms. Microbial relationships to immunology, sanitation, pollution and geochemical cycling. Not applicable for majors in Biological Sciences. (Lab fees assessed)

MCB 3007 Living with Microbes – GL (3). Explore the intricate relationship between human and planetary well-being and the microbes that inhabit us, both inside and outside our bodies.
MCB 3020 General Microbiology (3). MCB 3020L General Microbiology Lab (1). Introduction to the principles and techniques of microbiology, genetics, taxonomy, biochemistry and ecology of microorganisms. Prerequisites: Lecture: CHM 2210; and BSC 2010 and BSC 2011; or permission of the instructor. Prerequisite or Corequisite (Lab): MCB 3020. [B]

MCB 4022 Diversity of Microbes (3). An introduction to the diversity of microbes to include the structural and functions dynamics and interactions as assessed by traditional or genetic methods. Prerequisites: MCB 3020 or instructor’s permission. [B]

MCB 4203 Microbial Pathogenicity (3). MCB 4203L Microbial Path Lab (1). Host-parasite relationships: physiology of bacterial, fungal and viral pathogens emphasizing mechanisms of pathogenicity and the host response. Prerequisite (Lecture): MCB 3020. Prerequisite or Corequisite (Lab): MCB 4203 [C]

MCB 4404 Microbial Physiology (3). Introduction to the study of physiological and metabolic activities of microorganisms and processes that affect them. Prerequisites: MCB 3020, MCB 3020L. [C]

MCB 4404L Microbial Physiology Lab (1). Introduction to the study of physiological and metabolic activities of microorganisms and processes that affect them. Prerequisites: MCB 3020, MCB 3020L. Prerequisite or Corequisite: MCB 4404. [C]

MCB 4503 Virology (3). MCB 4503L Virology Lab (1). Principles and methods of study of bacterial, plant, and animal viruses. Molecular aspects of viral development, virus pathogens, and carcinogens. Prerequisites: CHM 2210. [C]

MCB 4603 Microbial Ecology (3). MCB 4603L Microbial Ecology Lab (1). Principles and applications of microbial interactions with the environment: physical, chemical, and biological. Prerequisites: MCB 3020 and MCB 3020L. [A]

MCB 5412 Advanced Microbial Physiology (3). Overview of microbial metabolic diversity, including prokaryotic metabolic pathways, stress responses, cell signaling, and metabolic regulation. Prerequisite: Permission of the instructor.

MCB 5453L Workshop: Prokaryotic Cell Signaling (1). Covers chemical signals used by prokaryotes for cell-to-cell communications. Prerequisites: MCB 3020 or permission of the instructor.

MCB 5605 Microbial Ecology (3). Principles and applications of microbial interactions with the environment. Current research areas are emphasized. Prerequisite: Graduate Level Standing.

OCB 1930 Marine Biology at FIU (1). Seminar course for freshmen or 1st year transfer students majoring in Marine biology. Topics will include an outline of the major, marine research being done at FIU, and careers in marine biology.

OCB 2000 Introductory Marine Biology – GL (3). OCB 2000L Introductory Marine Biology Lab (1). A survey of marine biological environments and zones, including the relationship of the physical and chemical environment to the distribution of marine plants and animals. (Lab fees assessed)

OCB 3043 Marine Biology and Oceanography (3). OCB 3043L Marine Biology and Oceanography Laboratory (1). An ecological approach to the biology of organisms in the marine environment with an emphasis on zonation and adaptation to the physical environment. Intended for biology majors or other science majors. Prerequisites (Lecture): BSC 2010 and BSC 2011. Prerequisites or Corequisites (Lab): OCB 3043 [A]

OCB 3264 Biology of Coral Reefs (3). Biology and ecological relationships of reef plants and animals with emphasis on their role in reef construction or bioerosion; reef constructional environments symbiotic relationships and biogeography. Prerequisites: BSC 2011 or Zoology. Ecology recommended. [A]

OCB 4004 Biological Oceanography at Sea I (3). An overview of current methods applied in biological oceanography including design of and working on research vessels and planning of research cruises. Prerequisite: OCB 3043. [A]

OCB 4005C Biological Oceanography at Sea II (4). Experience in research at sea involving cruise planning, participation in a research cruise, and sample data analysis. Methods oriented lectures/seminars and participation in lab and shipboard work. Prerequisites: OCB 4004 or permission of the instructor. [A]

OCB 4070 Coastal Marine Conservation (3). An overview of the basic subdisciplines - including science, governance, and policy - required for a detailed understanding of the most pressing problems threatening our coastal ecosystems. Prerequisites: OCB 3043 or PCB 3043. [A]

OCB 4104C Field Methods in Marine Ecology (4). Introduction to field and analytical methods applied in marine ecology research focusing on integrating principles of the scientific method, experimental design, data collection and analysis. Prerequisites: OCB 3043 or PCB 3043. [A]

OCB 4303 Biology of Marine Mammals (3). A survey of marine mammals including evolution, systematics, morphology, physiology, behavior, population dynamics, ecology, conservation and theory relevant to these areas of biology. Prerequisites: PCB 3043 or OCB 3043. [B]

OCB 4632 Marine Microbial Ecology (3). Diversity, ecology and physiology of marine viruses, bacteria and protozoa, their role in marine food webs and the biogeochemical cycling of carbon and nutrients, and the significance of microbial food webs for marine productivity. Prerequisites: OCB 3043. [A]

OCB 4633 Marine Community Ecology (3). A survey of the ecological patterns, processes, and interactions in marine environments with an emphasis on the ecology of different ecosystems and interactions among organisms. Prerequisite: PCB 3043. [A]
OCB 4711 Fisheries Science (3). Fundamental theory and techniques of fisheries science, including population dynamics, recruitment, migration, growth, measurement techniques and modeling. Prerequisites: BSC 2010 and BSC 2011. [A]

PCB 2061 Introductory Genetics (3). PCB 2061L Introductory Genetics Lab (1). Principles of Mendelian and molecular genetics with selected examples of applications such as genetic engineering and twin studies.

PCB 2099 Foundations of Human Physiology (3). PCB 2099L Foundations of Human Physiology Lab (1). Functional survey of the organ systems of the human body. Intended primarily for non-science majors. (Lab fees assessed)

PCB 3043 Ecology (3). PCB 3043L Ecology Lab (1). The basic principles governing the interaction of organism and environment. Trophic structure and energetics, species diversity, evolution of populations, biogeochemical cycles. Prerequisites (Lecture): BSC 2010 and BSC 2011. Prerequisites or Corequisites: PCB 3043 [A]

PCB 3063 Genetics (3). PCB 3063L Genetics Lab (1). Mendelian inheritance and introduction to molecular genetics. Prerequisites (Lecture): BSC 2010. Prerequisite or Corequisite: PCB 3063. [D]

PCB 3241 Biology of Aging (3). Biologic changes that occur in aging with emphasis on underlying regulatory mechanisms, including the aging genome and structural and functional changes in organ systems. Prerequisites: BSC 2010 and BSC 2011. [C]

PCB 3374 Tropical Ecology (3). In-depth survey of tropical climatology, ecological processes characteristic of tropical habitats, and biodiversity and conservation of tropical regions. Prerequisite: PCB 3043. [A]

PCB 3702 Intermediate Human Physiology (3). Functions of the human body and the physio-chemical mechanisms responsible for each organ’s function. Prerequisites: BSC 2010 or BSC 2011. [C]

PCB 3702L Intermediate Human Physiology Lab (1). Functions of the human body and the physio-chemical mechanisms responsible for each organ’s function. Prerequisite or Corequisite: PCB 3702. [C]

PCB 3703 Human Physiology I (3). PCB 3703L Human Physiology I Lab (1). Basic facts and concepts relating to the physiology of cells and nervous, muscular, and cardiovascular systems, with emphasis on regulatory mechanisms and abnormal physiology. Prerequisite (Lecture): BSC 2010. Prerequisite or Corequisite (Lab): PCB 3703. [C]

PCB 3704 Human Physiology II (3). PCB 3704L Human Physiology II Lab (1). Physiology of respiratory, gastrointestinal, excretory, endocrine and reproductive systems. Continuation of PCB 3703. Prerequisite (Lecture): BSC 2010. Prerequisite or Corequisite (Lab): PCB 3704. [C]

PCB 4023 Cell Biology (3). A structural and molecular analysis of cell function. Prerequisites: PCB 3063 and CHM 1046. [C]
PCB 4462C Introduction to Landscape Ecology with GIS (4). This course is a combined lecture and lab course that introduces students to concepts and practices of landscape ecology and uses of a geographic information system (GIS) in landscape ecology. Prerequisite: BSC 2010 and BSC 2011 Corequisite: have taken or are enrolled in PCB 3043. [A]

PCB 4467C Marine Protected Areas – GL (4). Introduction to the theory and methods for the design and management of Marine Protected Areas. Prerequisites: BSC 2010 and BSC 2011. [A]

PCB 4514 Advanced Genetics (3). Advanced level treatment of topics such as meiotic disjunction-uniparental disomy, transcription & splicing -differential splicing, polymorphisms, chromatin organization, horizontal gene transfer, etc. Prerequisite: PCB 3063. [C]

PCB 4524 Molecular Biology (3). PCB 4524L Molecular Biology Lab (1). Advanced nucleic acid and protein biochemistry: biosynthesis of macro-molecules and molecular genetics. Prerequisites (Lecture): PCB 3063, BCH 3033 or CHM 4304. Prerequisite or Corequisite: PCB 4524. [C]

PCB 4553 General Population Genetics – GL (3). Analysis of gene and genotype frequencies in theoretical and real populations. Topics include genetic drift, mutation, and selection. Prerequisite: PCB 3063. [A]

PCB 4561 Epigenetics (3). An overview of the mechanisms involved in epigenetic inheritance and their role in reproduction, development, environmental responses and health. Prerequisites: BSC1011, PCB3063 [D]

PCB 4663 General Human Genetics (3). Examination of genetics as it applies to the normal and abnormal human condition. Includes topics such as genetic engineering, cloning, and human evolution. Prerequisite: PCB 3063. [D]

PCB 4673 Evolutionary Ecology (3). PCB 4673L Evolutionary Ecology Lab (1). Adaptation and interaction of plants and animals in natural and disturbed habitats. Prerequisites (Lecture): PCB 3043 and PCB 3063. Prerequisite or Corequisite (Lab): PCB 4673. [A]

PCB 4674 Evolution (3). A study of the synthetic theory of evolution, its historic and experimental justification and the mechanisms of natural selection. Prerequisites: PCB 3063, PCB 3043. [B]

PCB 4676 Human Evolution (3). The evolutionary processes and relationships that have led to the unique biocultural development of the human species. Hominin origins and taxonomy are examined through fossil evidence. Prerequisites: BSC 2011 and PCB 3063. [B]

PCB 4717 Topics in Physiology/Biochemistry (3). An intensive study of a particular topic or topics in Physiology/Biochemistry not otherwise offered in the curriculum. Prerequisites: BSC 2010, BSC 2010L and BSC 2011L. [C]

PCB 4723 Animal Physiology (3). PCB 4723L Animal Physiology Lab (1). Advanced study of physiological mechanisms employed by animals to maintain function of the organ systems and to interact with the environment. Prerequisites (Lecture): BSC 2010, BSC 2011, and CHM 2211. Prerequisite or Corequisite: PCB 4723. [C]

PCB 4724 Comparative Physiology (3). PCB 4724L Comparative Physiology Lab I (1). Regulation of the internal environment: osmotic gastrointestinal, metabolic, circulatory and respiratory physiology. Prerequisites (Lecture): BSC 2010 and BSC 2011 and CHM 2210. Prerequisite or Corequisite (Lab): PCB 4724. [C]

PCB 4733 Human Systemic Physiology I (3). PCB 4733L Human Systemic Physiology Lab I (1). Selected topics in human physiology with emphasis on topics of clinical significance. Prerequisite (Lecture): BSC 2010. Prerequisite or Corequisite (Lab): PCB 4733. [C]

PCB 4734 Human Systemic Physiology II (3). Selected topics in human physiology with emphasis on topics of clinical significance. Prerequisites: BSC 2010. [C]

PCB 4776 Physiological and Behavioral Ecology of Marine Animals (3). An overview of the physiological and behavioral adaptations of marine animals to their environments. Prerequisites: BSC2010, BSC2011, and PCB3043. [C]

PCB 4805 Endocrinology (3). Biochemistry, physiology and anatomy of the endocrine systems of vertebrates and invertebrates. Steroid, peptide, and terpenoid hormones which control reproduction, growth, and other parameters. Prerequisites: BSC 2011, CHM 2211, and one physiology course. [C]

PCB 4805L Endocrinology Laboratory (1). A series of lab exercises and experiments designed to supplement lecture material in PCB 4805, and coordinated with that content. Corequisite: PCB 4805.

PCB 4932 Topics in Ecology (3). An intensive study of a particular topic or topic in Ecology not otherwise offered in the curriculum. Prerequisites: BSC 2010, BSC 2010L and BSC 2011, BSC 2011L. [A]

SCE 3813 Biology Education Seminar (1). Theoretical and practical introduction to pedagogical elements such as Cooperative, Inquiry and Problem-Based Learning. Students will learn how to teach biology effectively in the modern classroom. Prerequisite: Permission of the instructor.

ZOO 3205C Invertebrate Zoology (4). Taxonomy, anatomy, development, physiology and ecology of major invertebrate groups, including terrestrial and aquatic phyla. Prerequisite: BSC 2011. [B]

ZOO 3303 Vertebrate Zoology (3). ZOO 3303L Vertebrate Zoology Lab (1). Systematics, anatomy, physiology, development and ecology of vertebrate animals. Prerequisites (Lecture): BSC 2010 and BSC 2011 with BSC 2010L and BSC 2011L. Prerequisite or Corequisite: ZOO 3303. [B]
ZOO 3378C Forensic Osteology (4). A detailed examination of the human skeleton revealing such individual traits as sex, age, height, and race in order to assist law enforcement investigation in forensic identifications. Prerequisite: Permission of the instructor. [D]

ZOO 3603 Embryology (3). ZOO 3603L Embryology Lab (1). Animal morphogenesis. Laboratory must be taken with lecture. Prerequisites (Lecture): BSC 2010 and BSC 2011 with BSC 2010L and BSC 2011L. Prerequisite or Corequisite (Lab): ZOO 3603. [D]

ZOO 3713C Comparative Vertebrate Anatomy (4). Study of the structural diversity and classification of vertebrates and the evolution of various organ systems. Dissection of a variety of vertebrate specimens to reveal relationships of the various organ systems. Prerequisites: BSC 2010 and BSC 2011. [D]

ZOO 3731 Human Anatomy (3). ZOO 3731L Human Anatomy Demonstration (1). Survey of organ systems of the human body with major emphasis on the skeletal, muscular, and peripheral nervous system. Guided examination of prosected human cadavers. Prerequisites (Lecture): BSC 2010 or PCB 2099 or BSC 2023 or MCB 2000 or HSC 3549. Prerequisite or Corequisite (Lab): ZOO 3731. Concurrent enrollment in both lecture and laboratory required. [D]

ZOO 3753 Histology (3). ZOO 3753L Histology Lab (1). Microscopic anatomy of cells, tissues and organs. Prerequisites (Lecture): BSC 2010 and CHM 2210 and CHM 2211. Prerequisite or Corequisite (Lab): ZOO 3753. [D]

ZOO 4114 Principles of Paleobiology (3). Concepts and methods of paleobiology. Covers the nature of fossils, adaptation, systematics, evolutionary trends through time, global origination and extinction, paleoecology and paleobiogeography. Prerequisite: BSC 2011. [B]

ZOO 4234 General Parasitology (3). ZOO 4234L General Parasitology Lab (1). Modern concepts of biology, development, immunology and pathology of animal parasites. Prerequisite: BSC 2010. Corequisite: Concurrent registration of lecture and lab course. [B]

ZOO 4454 Fish Biology (3). Covers the systematics, anatomy, physiology, reproductive biology, and ecology of fish. Prerequisites: BSC 2010, BSC 2011, PCB 3043. [B]

ZOO 4462C Herpetology (4). Study of the biology of reptiles and amphibians with emphasis on the natural history and ecology of local species. Prerequisites: BSC 2010 and BSC 2011 and PCB 3043 or permission of the instructor. [B]

ZOO 4472 Ornithology (3). ZOO 4472L Ornithology Lab (2). Avian systematics, anatomy, physiology, behavior, ecology, evolution, and conservation. Labs teach visual and auditory identification, census techniques, banding, and taping. Field trips alternate Saturdays and at least one overnight weekend field trip. Prerequisites (Lecture): BSC 2010 and BSC 2011. Prerequisite or Corequisite (Lab): ZOO 4472. Concurrent registration of lecture with lab course. [B]

ZOO 4484 Primate Biology (3). ZOO 4484L Primate Biology Field Lab (1). Survey of the natural history of the prosimians, monkeys, and apes with special emphasis on primate anatomy, evolution, ecology, and behavior. Prerequisites (Lecture): BSC 2010 and BSC 2011 or permission of the instructor. Prerequisite or Corequisite (Lab): ZOO 4484. [B]

ZOO 4513 Animal Behavior (3). ZOO 4513L Animal Behavior Laboratory (2). Evolutionary approach to understanding the diversity of behavioral strategies. Ecological and physiological mechanisms of behavior will be emphasized. Prerequisites (Lecture): BSC 2010, BSC 2011. Prerequisite or Corequisite (Lab): ZOO 4513. [A]

ZOO 4733 Survey of Regional Anatomy (3). ZOO 4733L Survey of Regional Anatomy Lab (2). The regional anatomy of the human body as revealed by dissections, radiographs, models and videos. Prerequisites (Lecture): BSC 2011, BSC 2011L, CHM 1046, CHM 1046L, and PHY 2054 or PHY 2049. Prerequisite or Corequisite: ZOO 4733. (Lab fees assessed) [D]


ZOO 4744 Neurobiology (3). A comparative overview of the function of the nervous system covering neurons, sensory and motor systems, and the neural basis of behavior. Prerequisites: BSC 2010 and BSC 2011. [C]

ZOO 4781 Sensory Systems in Neurobiology (3). A comparative overview of sensory systems covering environmental stimuli, physical transduction, neural processing, and behavioral responses. Prerequisites: BSC 2010 and BSC 2011. [C]