### Business and Other Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT 160</td>
<td>College Algebra</td>
<td>4</td>
</tr>
<tr>
<td>ACC 202</td>
<td>Financial Accounting Information</td>
<td>3</td>
</tr>
<tr>
<td>ACC 203</td>
<td>Managerial Accounting...</td>
<td>3</td>
</tr>
<tr>
<td>ECO 204</td>
<td>Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECO 205</td>
<td>Principles of Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>FIN 310</td>
<td>Financial Management</td>
<td>3</td>
</tr>
<tr>
<td>ITM 200</td>
<td>Introduction to Computers</td>
<td>1</td>
</tr>
<tr>
<td>ITM 210</td>
<td>Managerial Statistics I</td>
<td>3</td>
</tr>
<tr>
<td>ITM 361</td>
<td>Operations Management</td>
<td>3</td>
</tr>
<tr>
<td>MGT 330</td>
<td>Principles of Management</td>
<td>3</td>
</tr>
<tr>
<td>MGT 335</td>
<td>Essentials of Corporate Responsibility</td>
<td>3</td>
</tr>
<tr>
<td>MKT 300</td>
<td>Principles of Marketing...</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total hours required = 87**

The eight-hour internship (ARM 498) will be taken throughout the sophomore, junior and senior years. Two hours must be reserved to be combined with the Senior Seminar (ARM 480).

A concentration in arts administration fulfills all foundation courses required for admission to the Master of Business Administration program.

### Marine Science Center

UT's waterfront Marine Science Center is located at Bayside Marina, about twenty minutes from campus. This 3,000-square-foot facility is well equipped to serve both students and faculty in marine science, environmental science and biology programs. The facility includes a wet laboratory and dry lab/classroom, SCUBA storage area, lockers, and a boat slip. The wet lab has a recirculating/flow-through seawater system with reservoirs at ground level. Three boats also are housed at the marina. On the eastern edge of the marina property is a mosaic of supratidal and shallow water habitats that UT faculty maintain. This mangrove/salt marsh/oyster reef/mud flat habitat makes an ideal location for environmental projects.

### Departmental Degree Requirements

All majors offered through the Department of Biology share as their foundation the Biology Lower-Core Curriculum. All students must complete these core courses with a 2.0 (C level work) combined minimum grade point average before they will be eligible to register for any of the upper-division BIO (numbered above 204) or MAR (numbered above 150) courses. Additionally, some individual courses within the Biology Lower-Core have a grade of C minimum requirement as noted in the Course-Description section of this Catalog. The Biology Lower-Core Curriculum consists of the following five courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 203</td>
<td>Biological Diversity</td>
<td>4</td>
</tr>
<tr>
<td>BIO 204</td>
<td>Biological Unity</td>
<td>4</td>
</tr>
<tr>
<td>CHE 152-153</td>
<td>General Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>CHE 154-155</td>
<td>General Chemistry II</td>
<td>4</td>
</tr>
<tr>
<td>MAT 170</td>
<td>Precalculus</td>
<td>4</td>
</tr>
</tbody>
</table>

Sem. Hrs. 16-20

*May be waived if student is placed directly into MAT 260–Calculus I.*
The faculty of the Biology Department strongly encourages all majors to complete the remaining science and math collateral and prerequisite courses associated with their particular degrees, as described below, prior to the end of their sophomore year.

**Biology**

**Requirements for BS or BA majors in biology:**

**Biology Lower-Core Curriculum 16-20**
- BIO 228 Biology of Plants ............ 4

**Genetics Requirement (Choose one) 4**
- BIO 300 General Genetics............. 4
- BIO 320 Molecular Genetics ............ 4

**Cellular and Physiology Requirement (Choose one) 4**
- BIO 227 Ecosystems and Ecophysiology ................ 4
- BIO 307 Microbiology .................... 4
- BIO 310 Developmental Biology ............ 4
- BIO 330 General Physiology ............. 4
- BIO 350 Cell Biology .................... 4
- BIO 360 Immunology .................... 4
- BIO 370 Molecular Biology ............ 4
- BIO 390 Essentials of Electron Microscopy .......... 4

**BIO 410** Senior Seminar ............... 1

**Concentration (described below) ...16-20**

Sem. Hrs. 45-53

**Collateral and prerequisite courses required for the BS-biology major:**
- CHE 232-235 Organic Chemistry I, II .......... 8
- PHY 200-201 General Physics I, II ............. 8
- MAT 260 Calculus ......................... 4

Sem. Hrs. 20

**Collateral and prerequisite courses required for the BA-biology major:**

**Physical Science Requirement (Choose one) 4**
- CHE 232-233 Organic Chemistry I ............ 4
- PHY 200 General Physics I ............. 4
- MAT 260 Calculus ......................... 4

Sem. Hrs. 8

**BIO 440 or 450 may be substituted if an oral presentation is made.**

Students who major in biology may use any of the collateral science courses required in the major to satisfy the natural science component of the general curriculum distribution requirements. Students may not count credits for both BIO 300 and 320 toward the degree requirements in any major or minor in biology, marine science-biology or environmental science. However, credits for both may count toward the 124-credit-hour graduation requirement. Students also may use the course required in mathematics to satisfy the mathematics requirement of the academic skills component of the general curriculum distribution requirements.

WRI 281 and MAT 201 are strongly recommended for those students planning to attend graduate or professional school.

**Requirements for a minor in biology:**

Twenty total semester hours of credit, including BIO 203, BIO 204 and 12 additional credit hours of BIO courses numbered above 204, or MAR courses above 150 excluding BIO 440, 450, 495 and 499.

**BS-Biology Concentrations**

The Bachelor of Science in Biology provides the student with a selection of courses needed to prepare for a career in the biological sciences, including many graduate and professional schools. This highly specialized curriculum includes more extensive requirements in chemistry and physics in order to maximize the future scientific opportunities available to students.

**General Biology Concentration**

This concentration meets the requirements of a variety of career paths, including industrial positions, secondary education, and graduate programs in biology. Students must complete a minimum of four additional biology courses (not including BIO 440, 450, 495 or 499) to be determined in consultation with advisors. In addition to the core requirements for a degree in biology, students may select any BIO courses above 204 or MAR courses above 150 to fulfill the elective requirements.

Sem. Hrs. 16

**Biology Education Majors**

Students pursuing education degrees must consult the Education section of this catalog for a complete listing of course requirements, as well as the sequence in which to take these
courses. For up-to-date information, contact the Department of Education office in Plant Hall 439.

**Pre-Professional Concentration (including Pre-Medicine, Pre-Dentistry, Pre-Veterinary Science)**

Students interested in these professional careers usually major in biology, selecting courses from the pre-professional concentration. Students also may choose to major in chemistry or biochemistry. Other majors are possible, provided the entrance requirements for professional schools are completed. Students should design their academic programs in consultation with their advisors.

Students requesting letters of recommendation to professional schools must do so through the Pre-Professional Committee by submitting their requests to the Departmental Office (SC-207).

The pre-professional concentration is designed to prepare students for application to professional schools such as medical, dental, veterinary, etc. The Army ROTC Department can assist pre-professional students with their graduate program finances through the Health Sciences Professional Scholarship Program. For more information, contact the Army ROTC Department at (813) 258-7200 or UT ext. 3044. After consultation with their advisors, students should complete at least four of the following courses as their biology major electives:

**Biology–Pre-Professional Concentration**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 220</td>
<td>Behavioral Biology</td>
<td>4</td>
</tr>
<tr>
<td>BIO 250</td>
<td>Comparative Vertebrate Anatomy</td>
<td>4</td>
</tr>
<tr>
<td>BIO 307</td>
<td>Microbiology</td>
<td>4</td>
</tr>
<tr>
<td>BIO 310</td>
<td>Developmental Biology</td>
<td>4</td>
</tr>
<tr>
<td>BIO 317</td>
<td>Parasitology</td>
<td>4</td>
</tr>
<tr>
<td>BIO 330</td>
<td>General Physiology</td>
<td>4</td>
</tr>
<tr>
<td>BIO 350</td>
<td>Cell Biology</td>
<td>4</td>
</tr>
<tr>
<td>BIO 360</td>
<td>Immunology</td>
<td>4</td>
</tr>
<tr>
<td>BIO 370</td>
<td>Molecular Biology</td>
<td>4</td>
</tr>
<tr>
<td>BIO 390</td>
<td>Essentials of Electron Microscopy</td>
<td>4</td>
</tr>
<tr>
<td>CHE 320</td>
<td>Biochemistry</td>
<td>4</td>
</tr>
<tr>
<td>CHE 420</td>
<td>Advanced Biochemistry</td>
<td>4</td>
</tr>
<tr>
<td>Elective</td>
<td>from any course above</td>
<td>4</td>
</tr>
</tbody>
</table>

**Concentration in Molecular Biology**

Molecular biology, along with the laboratory tools it employs, is a sub-discipline within biology that has become an important component of our economy. Students interested in pursuing advanced degrees in this field or careers in laboratory or research environments involving molecular biology are encouraged to pursue this concentration. Students who pursue this concentration enroll in BIO 320 as part of their degree plans.

**Molecular Biology Concentration**

Select four courses from the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 307</td>
<td>Microbiology</td>
<td>4</td>
</tr>
<tr>
<td>BIO 310</td>
<td>Developmental Biology</td>
<td>4</td>
</tr>
<tr>
<td>BIO 330</td>
<td>General Physiology</td>
<td>4</td>
</tr>
<tr>
<td>BIO 350</td>
<td>Cell Biology</td>
<td>4</td>
</tr>
<tr>
<td>BIO 360</td>
<td>Immunology</td>
<td>4</td>
</tr>
<tr>
<td>BIO 370</td>
<td>Molecular Biology</td>
<td>4</td>
</tr>
<tr>
<td>BIO 390</td>
<td>Essentials of Electron Microscopy</td>
<td>4</td>
</tr>
<tr>
<td>CHE 320</td>
<td>Biochemistry</td>
<td>4</td>
</tr>
<tr>
<td>CHE 420</td>
<td>Advanced Biochemistry</td>
<td>4</td>
</tr>
<tr>
<td>Elective</td>
<td>from any course above</td>
<td>4</td>
</tr>
</tbody>
</table>

Sem. Hrs. 16

*BIO 300, 320, 395, 440, 450 and 499 cannot be used as electives to satisfy this requirement.

**Biology-Business Concentration**

Consisting of the biology major courses plus four electives in the Biology Department above 204 (excluding BIO 440, 450, 495 and 499) with the following business courses, the biology-business concentration is designed for students who are interested in biology but wish to pursue business careers. These individuals may find opportunities in technical sales or managerial positions in biomedical, agricultural and chemical industries. The biology major (plus electives) with these business courses fulfills all foundation courses (except ITM 200 and 361) required for admission to the Master of Business Administration program at The University of Tampa.

**Requirements for the biology-business concentration:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 202</td>
<td>Financial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ACC 203</td>
<td>Managerial Accounting</td>
<td>3</td>
</tr>
</tbody>
</table>

Sem. Hrs. 16
Bachelor of Arts Concentrations
The Bachelor of Arts in Biology provides the student with a more liberal (less prescribed) educational pathway. As a result, it is most appropriate for students with interests that range outside of biology, or those wishing to specialize in a field of biology that is less reliant on the collateral sciences of physics and chemistry (see below).

General Biology Concentration
This concentration is the most flexible way of completing the degree requirements for a major in biology. Students must complete a minimum of six additional biology courses (not including BIO 440, 450, 495 or 499) that includes at least one from each of the broad areas of Ecosystem/Landscape Biology, Organismal Biology, and Cellular/Molecular Biology, to be determined in consultation with advisors. In addition to the core requirements for a degree in biology, students may select any BIO courses above 204 or MAR courses above 150 to fulfill the elective requirements.
Sem. Hrs. 24

Course Distribution Categories
Ecosystem/Environmental Biology:
BIO 212 Ecology
MAR 222 Marine Ecology
BIO 227 Ecosystems and Ecophysiology
BIO 242 Introduction to Environmental Science and Policy
BIO 346 Conservation Biology

Organismal/Evolutionary Biology:
BIO 220 Behavioral Biology
BIO 224 Invertebrate Zoology
BIO 225 Vertebrate Zoology
BIO 228 Biology of Plants
BIO 250 Comparative Vertebrate Anatomy
BIO 307 Microbiology
BIO 317 Parasitology
BIO 340 Ichthyology
BIO 400 Evolution
MAR 226 Marine Zoology
MAR 327 Marine Botany

Cellular/Molecular Biology:
BIO 300 General Genetics
BIO 310 Developmental Biology
BIO 320 Molecular Genetics
BIO 330 General Physiology
BIO 350 Cell Biology
BIO 360 Immunology
BIO 370 Molecular Biology

Organismal and Evolutionary Biology Concentration
This concentration meets the requirements for a variety of career paths in organismal and evolutionary biology, secondary education, and graduate programs in these fields. Students are required to complete BIO 400 Evolution as well as five additional biology courses (not including BIO 440, 450, 495 or 499) to be determined in consultation with advisors from among the list below.
BIO 400 Evolution (required) ....... 4
Ecology Elective (if chosen, may only take one of the following) ............... 4
BIO 212 Ecology
MAR 222 Marine Ecology

Remaining Electives
BIO 220 Behavioral Biology........ 4
BIO 224 Invertebrate Zoology...... 4
BIO 225 Vertebrate Zoology....... 4
MAR 226 Marine Zoology.......... 4
BIO 227 Ecosystems and Ecophysiology .............. 4
BIO 250 Comparative Vertebrate Anatomy .............. 4
BIO 317 Parasitology .............. 4
MAR 327 Marine Botany ............ 4
BIO 307 Microbiology ............... 4
BIO 310 Developmental Biology... 4
BIO 330 General Physiology ...... 4
BIO 340 Ichthyology ............... 4
Sem. Hrs. 24
Marine Science-Biology Major

Requirements for a BS double major in marine science* and biology:
Biology Lower-Core Curriculum .................................16-20

Ecology Requirement (Choose one) 4
BIO 212 Ecology
MAR 222 Marine Ecology
BIO 410 Senior Seminar ** ............ 1
MAR 327 Marine Botany ............. 4
Electives above BIO 204 or MAR 150 8

Genetics Requirement (choose one) 4
BIO 300 General Genetics
BIO 320 Molecular Genetics

Cellular/Physiological Requirement (choose one) 4
BIO 227 Ecosystems and Ecophysiology
BIO 307 Microbiology
BIO 310 Developmental Biology
BIO 330 General Physiology
BIO 350 Cell Biology
BIO 360 Immunology
BIO 370 Molecular Biology
BIO 390 Electron Microscopy
CHE 320 Biochemistry

Organismal Invertebrate Requirement (choose one) 4
BIO 224 Invertebrate Zoology
MAR 226 Marine Zoology

Organismal Vertebrate Requirement (choose one) 4
BIO 225 Vertebrate Zoology
BIO 250 Comparative Vertebrate Anatomy

Physical/Chemical Requirement (select two) 8
MAR 150 Physical Geology
MAR 301 Physical Oceanography
CHE 180 Environmental Chemistry
Sem. Hrs. 57-61

Collateral and/or prerequisite courses required for the double major in Marine Science-Biology:
CHE 232-235 Organic Chemistry I, II ............. 8
PHY 200-201 General Physics I .......... 4
MAT 260 Calculus I .................... 4
Sem. Hrs. 20

Marine science may not be taken as a single major because of its highly specialized nature.

** BIO 440 or 450 may be substituted if an oral presentation is made.

Students who double-major in marine science-biology may use any of the science or marine science courses required in the major to satisfy the natural science component of the general curriculum distribution requirements listed in the catalog.

Requirements for a minor in marine biology:
BIO 203 and 204; BIO 212 or MAR 222; MAR 226 or BIO 224; and MAR 327.

Marine Science-Chemistry

Requirements for a double major in marine science* and chemistry:
Biology Lower-Core Curriculum .................................16-20

Ecology Requirement (Choose one) 4
BIO 212 Ecology
MAR 222 Marine Ecology
MAR 150 Physical Geology ............ 4
MAR 226 Marine Zoology ............. 4
MAR 327 Marine Botany ............. 4
MAR 301 Physical Oceanography ... 4
CHE 180 Environmental Chemistry
Sem. Hrs. 40-44

Courses required for the chemistry major:
CHE 152-155 General Chemistry I, II ............. 8
CHE 310 Analytical Chemistry ........ 4
CHE 232-235 Organic Chemistry I, II ............. 8
CHE 352-355 Physical Chemistry I, II ............. 8
CHE 425 Advanced Inorganic Chemistry ............. 4
CHE 451, 452 or 453 ............. 2
Sem. Hrs. 34

Collateral and prerequisite courses required for the double major:
PHY 200 General Physics I ............. 4
PHY 201 General Physics, II .......... 4
MAT 260 Calculus I .................... 4
MAT 261 Calculus II ............. 4
Sem. Hrs. 16
*Marine science may not be taken as a single major because of its highly specialized nature. Students who double-major in marine science-chemistry may use any of the science or marine science courses required in the major to satisfy the natural science component of the general curriculum distribution requirements listed in the catalog.

**Gulf Coast Research Laboratory**

The University maintains a formal affiliation with the Gulf Coast Research Laboratory (GCRL), an educational and research institute located in Ocean Springs, Mississippi. Through this arrangement, students may take field courses in marine science at GCRL during the summer. Course credit is awarded through the University of Southern Mississippi and will be accepted as transfer credit at UT. Below is a list of courses taught at GCRL and their semester hours of credit. These courses may be applied toward majors in biology, marine-science/biology, and environmental science.

**Marine Science I: Oceanography** .... 5
**Marine Science II: Marine Biology** .... 5
**Coastal Marine Geology** ............... 3
**Coastal Vegetation** ...................... 4
**Marine Invertebrate Zoology** ........ 6
**Marine Ichthyology** ..................... 6
**Marine Mammals** ......................... 5
**Fauna and Faunistic Ecology of**
Salt Marshes, Seagrasses and Sand Beaches ........................................ 5
**Sand Beach Ecology** ..................... 5
**Marine Ecology** ......................... 5
**Elasmobranch Biology** ................... 5
**Special Problems in Marine**
Science .................................................................. 1-6
**Special Topics in Marine Science** .... 1-6

*Complete information about the GCRL program is available in the Department of Biology.*

**Environmental Science**

Requirements for a major in environmental science:

**Biology Lower-Core Curriculum  16-20**

BIO 212  Ecology ......................... 4
BIO 228  Biology of Plants .............. 4

BIO 242  Introduction to
Environmental Science
and Policy ......................... 4
BIO 346  Conservation Biology ....... 4
BIO 410* Senior Seminar ............... 1
CHE 310  Analytical Chemistry ....... 4
CHE 180  Environmental
Chemistry ............................... 4
MAT 260  Calculus I ....................... 4
MAT 201  Statistics ....................... 4
WRI 281  Technical Writing ............. 4

*Elections (see below) ................. 12
Sem. Hrs. 65-69

*BIO 440 or 450 may be substituted if an oral presentation is made.

**Category One Electives**
(at least two of the following): 8

BIO 220  Behavioral Biology .......... 4
BIO 224  Invertebrate Zoology ...... 4
BIO 225  Vertebrate Zoology .......... 4
BIO 340  Ichthyology .................... 4
BIO 307  Microbiology .................. 4
BIO 317  Parasitology ................... 4
MAR 150  Physical Geology .......... 4
MAR 226  Marine Zoology .............. 4
MAR 301  Physical Oceanography ..... 4
(see prerequisites)
MAR 327  Marine Botany ............... 4

**Category Two Electives**
(at least two of the following): 4

COM 224  Mass Media and Society
Geography Elective
(If chosen, may only take one of the
following two)
GEO 202  Physical Geography ...... 4
GEO 205  Principles of Resource
Utilization .............................. 4
PHL 208  Business Ethics .......... 4
PHL 210  Environmental Ethics .... 4

Students who major in environmental science may use any of the category one electives to satisfy the natural science component of the general curriculum distribution requirements. They also may use the courses required in mathematics to satisfy the mathematics requirement of the academic skills component of the general curriculum distribution.
Requirements for a minor in environmental science consist of the following five courses:
BIO 203, 204, 212, 242 and 346; and one of the following courses, PHL 210, MAR 126, MAR 226 or BIO 224. It is further recommended that students who are not science majors take MAR 150 or CHE 126 for the physical science requirement.

Department of Chemistry and Physics

Faculty: Professor Burroughs, Chair; Professors Ford, Laurino; Associate Professor Hendrix; Assistant Professors Allen, Ballard, Carastro, Deneault, Jackman, Perry, Struss; Visiting Professor Cannon; Instructor Bender.

Degrees Offered: BS, chemistry; BS, chemistry-professional; BS, biochemistry; BS, forensic science; BA, chemistry; BS, chemistry (biochemistry)/MBA.

The Chemistry Department offers its students a solid foundation in the five major areas of chemistry: analytical chemistry, biochemistry, inorganic chemistry, organic chemistry and physical chemistry. Research projects, publishing opportunities, internships, and classes with both lecture and laboratory experience give chemistry majors the necessary theoretical knowledge and practical laboratory experience to either enter the job market with a BS degree or go on to graduate or professional school with either a BS, BS-professional or BA degree.

Each program is a continuum of prerequisites designed to best develop the student’s knowledge of chemistry in each of the five major areas. In upper-level classes, the average course size drops from about 30 students to approximately 5 to 10 students per class. This small class size not only gives students the opportunity to work with equipment not often available to undergraduates at large institutions, but also allows for frequent direct interaction with the faculty.

Given the small class size at the University and the varied research interest of the chemistry faculty, experiential learning opportunities are available and encouraged. Students working with faculty members have completed projects in environmental analysis, atmospheric chemistry, marine nutrient analysis, protein chemistry, organic reaction mechanisms, electroanalysis and biosensor development.

Each member of the faculty is an expert in at least one of the aforementioned areas of chemistry. Each chemistry major is assigned a faculty member who serves as an advisor and whose specialty coincides with the student’s area of interest. Advisors and students work together to select courses, review academic and professional progress, and discuss career and graduate opportunities.

Pre-Professional Concentration

Students interested in medicine, dentistry or veterinary science may wish to consider the BA in chemistry. This degree program has been specifically designed for pre-professional students whose interests lie in the chemical sciences. While any of the degree programs offered by the Department of Chemistry provides the opportunity for professional school admission, the BA degree, with fewer credit hours than the BS degrees, allows the student to explore other academic disciplines through electives, providing the well-rounded educational experience professional schools actively seek in their applicants. In addition to the chemistry majors, students also may choose biology or other majors, provided the entrance requirements for professional schools are completed. Students should design their academic programs in consultation with their advisors.

Students requesting letters of recommendation to professional schools must do so through the pre-professional advisor, Dr. David Ford, who chairs the Pre-Professional Committee.

The Army ROTC Department can assist pre-professional students with their professional program finances through the Health Science Professional Scholarship Program. For more information, contact the Army ROTC Department at (813) 258-7200 or UT ext. 3044.