• **BIOLOGY (BIO/MRN/MIC)**

Two specific Bachelor of Science degrees, Biology and Microbiology, are available for students interested in the biological sciences. The B.S. in Biology allows students to concentrate in such areas as Ecology, Cell & Molecular Biology, Physiology, and Marine Biology. The degree is preparatory for careers in such areas as teaching, agriculture, medicine, dentistry, conservation, and biotechnology, or for post-baccalaureate study in the various life sciences. The B.S. in Microbiology provides students with the broad range of courses necessary to qualify for certification by the National Registry of Microbiologists, American Society of Microbiology, and employment in microbiology and related fields.

In addition to a set of courses in biology, students must have a thorough preparation in other areas of natural sciences to be competitive for jobs or for further study beyond the baccalaureate. A modern biology curriculum is built on a foundation of mathematics, chemistry and physics. Students should study the requirements listed below and then make maximum use of the vigorous advising program maintained by the Department in structuring their programs.

**Requirements for Entrance into either the Biology or Microbiology Degrees**

1. Completion of two semesters of college-level basic biology (BSC 2010 / 2010L and BSC 2011 / 2011L, or equivalents); two semesters of college-level basic chemistry (CHM 2045 / 2045L and CHM 2046 / 2046L, or equivalents); and one semester of any college-level mathematics, physics, or statistics course.

2. A cumulative GPA of at least 2.75 in the five courses listed above.

These requirements will NOT BE WAIVED for students who pass major courses beyond college-level basic biology, but do not have the necessary cumulative GPA (2.75) in the five courses listed above.

**Requirements for the Biology B.S. Major (BIO)**

**Prerequisites (State Mandated Common Prerequisites) for Students Transferring from a Community College:** Students should complete the following prerequisite courses listed below at the lower level prior to entering the university. If these courses are not taken at the community college, they must be completed before the degree is granted. Unless stated otherwise, a grade of "C" is the minimum acceptable grade.

**BSC 1010/1010L** Introduction to Biology I-Cellular Processes (with lab)
Acceptable substitutes: PCB X010, PCB X011, PCB X021, PCB X131, BSC X040, BSC 2012

**BSC 1011/1011L** Introduction to Biology II-Diversity (with lab)
Acceptable substitutes: ZOO X010, BOT X010, BSC X040, BOT X013

**CHM 1045/1045L** General Chemistry I (with lab)
Acceptable substitutes: ZOO X010, BOT X010, BSC X040, BOT X013

**CHM 1046/1046L** General Chemistry II (with lab)
Acceptable substitutes: PHY 3043/3043L, PHY 3048/3048L, PHY 3049/3049L, or equivalent

**CHM 2211/2211L** Organic Chemistry I (with lab)
Acceptable substitutes: PHY 3053/3053L, PHY 3048/3048L, PHY 3049/3049L, or equivalent

**MACX312** Calculus II
Acceptable substitutes: STA 2122, 2014, 2023, 2034, 2321 or equivalent; MAC 2234, 2254, 3282

Please be aware of the immunization, foreign language, and continuous enrollment policies of the university. This is a non-limited access program with the above courses recommended.

**Required Courses for the Biology Major**

1. Department of Biology Courses-minimum 40 credit hours
   a. BSC 2010 Biology I Cellular Processes (3)
   BSC 2010L Biology I Cellular Processes Laboratory (1)
   BSC 2011 Biology II Diversity (3)
   BSC 2011L Biology II Diversity Laboratory (1)
   b. PCB 3023 Cell Biology (3)
   PCB 3043 Principles of Ecology (3)
   PCB 3063 General Genetics (3)
   c. **ONE** of the following:
   PCB 3023L Cell Biology Laboratory (1)
   PCB 3043L Principles of Ecology Laboratory (1)
   PCB 3063L General Genetics Laboratory (1)
   d. **ONE** of the following (with laboratory):
   BOT 3373C Vascular Plants: Form and Function (4)
   MCB 3020C General Microbiology (4)
   ZOO 3205C Advanced Invertebrate Zoology (4)
   ZOO 3713C Comparative Vertebrate Anatomy (4)
   ZOO 4603C Animal Embryology (4)
   ZOO 4753C Histology (4)
   e. **ONE** of the following (with laboratory):
   MCB 4404 Microbial Physiology and Genetics (4)
   PCB 4723 Animal Physiology (3)
   f. The remaining credit hours to meet the minimum requirements must come from among structured departmental courses that are applicable to the major and BSC 3023. At least eight (8) of these credit hours must be at the 4000 level or higher.
   g. A maximum of four (4) credit hours of Undergraduate Research (BSC 4910) or Biology Honors Thesis (BSC 4970) may be applied.
   h. A minimum of 20 hours of Biology courses must be taken in residency and be applicable to the major.

2. Supporting Courses in the Natural Sciences-minimum 32 credit hours
   a. CHM 2045 General Chemistry I (3)
   CHM 2045L General Chemistry I Laboratory (1)
   CHM 2046 General Chemistry II (3)
   CHM 2046L General Chemistry II Laboratory (1)
   b. CHM 2210 Organic Chemistry I (3)
   CHM 2210L Organic Chemistry I Laboratory (2)
   CHM 2211 Organic Chemistry II (3)
   CHM 2211L Organic Chemistry II Laboratory (2)
   c. MAC 2241 Life Sciences Calculus I (4)
   and MAC 2242 Life Sciences Calculus II (4)
   OR MAC 2281 Engineering Calculus I (4)
   and MAC 2282 Engineering Calculus II (4)
   OR MAC 2311 Calculus I (4)
   and MAC 2312 Calculus II (4)
   OR MAC 2241 Life Sciences Calculus I (4)
   and STA 2023 Introductory Statistics I (4)
   d. PHY 2048 General Physics I (3)
   OR PHY 2048L General Physics I Laboratory (1)
   OR PHY 2049 General Physics II (3)
   OR PHY 2049L General Physics II Laboratory (1)
   OR PHY 2053 General Physics (3)
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PHY 2053L General Physics Laboratory (1)
PHY 2054 General Physics (3)
PHY 2054L General Physics Laboratory (1)

3. Liberal Arts Courses-minimum 45 credit hours
4. Free Elective Courses needed to complete 120 credit hours.

Requirements for the Biology B.S. Major with a Concentration in Marine Biology (MRN)

Prerequisites (State Mandated Common Prerequisites) for Students Transferring from a Community College: Students should complete the following prerequisite courses listed below at the lower level prior to entering the university. If these courses are not taken at the community college, they must be completed before the degree is granted. Unless stated otherwise, a grade of "C" is the minimum acceptable grade.

i. PHY 2048L General Physics I Laboratory (3)
ii. PHY 2049 General Physics II (3)
iii. PHY 2049L General Physics II Laboratory (1)
iv. OR
v. PHY 2048L General Physics I Laboratory (3)
vi. PHY 2049 General Physics II (3)

3. Liberal Arts Courses-minimum 45 credit hours
4. Free Elective Courses needed to complete 120 credit hours.

Requirements for the Microbiology B.S. Major (MIC)

Prerequisites (State Mandated Common Prerequisites)

Students should complete the following prerequisite courses listed below at the lower level prior to entering the university. If these courses are not taken at the community college, they must be completed before the degree is granted. Unless stated otherwise, a grade of "C" is the minimum acceptable grade.

i. MAC X311 Calculus I
ii. MAC X312 Calculus II

Please be aware of the immunization, foreign language, and continuous enrollment policies of the university. This is a non-limited access program with the above courses recommended.

Required Courses for the Biology Major with a Marine Biology Concentration

1. Department of Biology Courses-minimum 42 credit hours
   a. BSC 2010 Biology I Cellular Processes (3)
   b. BSC 2010L Biology I Cellular Processes Laboratory (1)
   c. PCB 3023 Cell Biology (3)
   d. PCB 3043 Principles of Ecology (3)
   e. PCB 3063 General Genetics (3)
   f. ONE of the following:
      i. BSC 2011 Biology II Diversity (3)
      ii. BSC 2011L Biology II Diversity Laboratory (1)
      iii. PCB 3023L Cell Biology Laboratory (1)
   g. Seminar in Marine Biology
   h. The remaining nine (9) credit hours to meet the minimum requirements must come from courses listed in (i) above and/or from the following list. A maximum of six (6) credits may be taken in courses from other departments/colleges. At least eight (8) of these credit hours must be at the 4000 level or higher:
   i. OCB 6050 Biological Oceanography
   ii. OCC 6050 Chemical Oceanography
   iii. OCC 6051 Geological Oceanography
   iv. OCP 4674 Organic Evolution
   v. OCB 5185 Marine Botany
   vi. BSC 4933 Advanced Marine Biology and lab

2. Supporting Courses in the Natural Sciences-minimum 32 credit hours
   a. CHM 2210 Organic Chemistry I (3)
   b. CHM 2210L Organic Chemistry I Laboratory (1)
   c. CHM 2211 Organic Chemistry II (3)
   d. CHM 2211L Organic Chemistry II Laboratory (1)
   e. CHM 2212 Organic Chemistry III (3)
   f. CHM 2212L Organic Chemistry III Laboratory (1)
   g. MAC 2241 Life Sciences Calculus I (4)
   h. MAC 2422 Life Sciences Calculus II (4)
   i. MAC 2423 Calculus III (3)
   j. MAC 2423L Calculus III Laboratory (1)
   k. MAC 2424 Life Sciences Calculus IV (4)
   l. MAC 2424L Calculus IV Laboratory (1)
   m. PCB 3023 Cell Biology (3)
   n. PCB 3023L Cell Biology Laboratory (1)
   o. PCB 3043 Principles of Ecology (3)
   p. PCB 3043L Principles of Ecology Laboratory (1)
   q. PCB 3063 General Genetics (3)
   r. PCB 3063L General Genetics Laboratory (1)
   s. PCS 3063 General Genetics Laboratory (1)
   t. BSC 4933 Advanced Marine Biology and lab

3. Liberal Arts Courses-minimum 45 credit hours
4. Free Elective Courses needed to complete 120 credit hours.

5. Student applies to Marine Biology Program after meeting all entrance requirements of BIO major. In addition, a student must have a major GPA of at least 3.0 at the time of application and maintain a major GPA of at least 3.0 throughout the Program.
college, they must be completed before the degree is granted. Unless stated otherwise, a grade of "C" is the minimum acceptable grade.

### Required Courses for the Microbiology Major

A student must receive a "C" grade or better in all Department of Biology courses and Supporting Courses in the Natural Sciences, except if they are used as Free Elective courses. This specification applies to both USF and transfer coursework. D and F grades earned in attempting to satisfy major requirements will be used in calculating the GPA, except if they are removed by grade forgiveness.

#### Minimum Grade for Majors

A student must receive a "C" grade or better in all Department of Biology courses and Supporting Courses in the Natural Sciences, except if they are used as Free Elective courses. This specification applies to both USF and transfer coursework. D and F grades earned in attempting to satisfy major requirements will be used in calculating the GPA, except if they are removed by grade forgiveness.

### BIOLOGY HONORS PROGRAM

The Biology Honors Program is a program that provides a challenging and enriching program for highly motivated students. Students must major in Biology, and they begin taking courses together upon entry to USF. They are admitted to the program at the end of their second semester. Criteria include a minimum 3.5 GPA. The program provides a research experience in a Biology Faculty laboratory. (http://www.cas.usf.edu/biology/index.html), and requires a written thesis. A Research Seminar is presented by the student.

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