• 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 X21, PCB X131, BSC X040, BSC 2012

BSC 1011/1011L
Introduction to Biology II-Diversity (with lab)
Acceptable substitutes: ZOO X010, BOT X011, BSC X041, BOT X013

CHM 1045/1045L General Chemistry I (with lab)
CHM 1046/1046L General Chemistry I (with lab)
Acceptable substitutes: PHY 3048/3048L, PHY 3049/3049L, or equivalent

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

BCH 3023. At least eight (8) of these credit hours must be from the following (with laboratory):

PCB 3043 Principles of Ecology (3)
PCB 3063 General Genetics (3)

One of the above:

a. CHM 2211 Organic Chemistry II (3)
b. PCB 3043 Principles of Ecology Laboratory (3)
c. PCB 3063 General Genetics Laboratory (3)

Students Transferring from a Community College

Prerequisites (State Mandated Common Prerequisites) for courses listed above.

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. Supporting Courses in the Natural Sciences-minimum 32 credit hours

a. CHM 2045 General Chemistry I (3)
CHM 2046L General Chemistry I Laboratory (1)
CHM 2046 General Chemistry I (3)
CHM 2046L General Chemistry I 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)

3. Liberal Arts Courses-minimum 45 credit hours

Please be aware of the immunization, foreign language, and continuous enrollment policies of the university. This is a nonlimited 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)
b. BSC 2010L Biology I Cellular Processes Laboratory (1)
c. BSC 2011 Biology II Diversity (3)
d. BSC 2011L Biology II Diversity Laboratory (1)
e. PCB 3023 Cell Biology (3)
f. PCB 3063 General Genetics (3)

2. Supporting Courses in the Natural Sciences-minimum 32 credit hours

a. CHM 2210L Organic Chemistry I Laboratory (2)
b. PCB 3043L Principles of Ecology Laboratory (1)
c. PCB 3063L General Genetics Laboratory (1)
d. PCB 4723 Animal Physiology (3)

e. The remaining credit hours to meet the minimum requirements must come from among structured departmental courses that are applicable to the major and BCH 3023. At least eight (8) of these credit hours must be at the 4000 level or higher.

3. Liberal Arts Courses-minimum 45 credit hours

a. MAC 2242 Life Sciences Calculus II (4)
b. MAC 2244 Microbial Physiology and Genetics (4)
c. PCB 3043 Principles of Ecology Laboratory (1)
d. PCB 3063 General Genetics Laboratory (3)
e. The remaining credit hours to meet the minimum requirements must come from among structured departmental courses that are applicable to the major and BCH 3023. At least eight (8) of these credit hours must be at the 4000 level or higher.

4. Free Elective Courses needed to complete 120 credit hours.
Requirements for the Biology B.S. Major with a Concentration in Marine Biology

1. Department of Biology Courses—minimum 42 credit hours
   a. BSC 2010L Biology I Cellular Processes (3)
   b. BSC 2011 Biology II Diversity (3)
   c. One of the following:
      i. PCB 3023 Cell Biology (3)
      ii. PCB 3043 Principles of Ecology (3)
      iii. PCB 3063 General Genetics (3)
   d. BSC 3263C Marine Biology (3)
   e. One of the following (with laboratory):
      i. BOT 4503 Plant Physiology (3)
      ii. MCB 4404 Microbial Physiology and Genetics (4)
      iii. PCB 4723 Animal Physiology (3)
   f. At least one of the following: Vascular Plants (BOT 3373C), Microbiology (MCB 3020C), Vertebrate Zoology (ZOO 3203), Comparative Vertebrate Anatomy (ZOO 3713), Advanced Vertebrate Zoology and Lab. (ZOO 3205)
   g. Seminar in Marine Biology (3)
   h. The remaining nine (9) credit hours to meet the minimum requirements must come from courses listed in (f) 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. OCG 6051 Geological Oceanography
      iv. OCP 6050 Physical Oceanography
      v. GLY 4734 Beaches and Coastal Environments
      vi. GEO 5177 Geographic Information Systems
      vii. ZOO 5456 + ZOO 5456L Ichthyology
      viii. MCB 5600 Applied and Environmental Microbiology
      ix. ZOO 5555C Marine Animal Ecology
      x. ZOO 4513 Animal Behavior
      xi. PCB 4674 Organic Evolution
      xii. BOT 5185C Marine Botany
      xiii. BSC 4933 Advanced Marine Biology and Lab

2. Supporting Courses in the Natural Sciences—minimum 32 credit hours
   a. CHM 2045 General Chemistry I (3)
   b. CHM 2046 General Chemistry II (3)
   c. CHM 2046L General Chemistry II Laboratory (1)
   d. CHM 2210 Organic Chemistry I (3)
   e. CHM 2211L Organic Chemistry II Laboratory (1)
   f. Acceptable substitutes: PHY 3043/3043L, PHY 3048/3048L, PHY 3049/3049L, or equivalent
   g. CHM 2211L Organic Chemistry II Laboratory (1)
   h. Acceptable substitutes: PHY 3053/3053L, PHY 3048/3048L,PHY 3049/3049L, or equivalent
   i. MAC 2241 Life Sciences Calculus I (4)
   j. and
   k. MAC 2242 Life Sciences Calculus II (4)
   l. OR
   m. MAC 2281 Engineering Calculus I (4)
   n. and
   o. MAC 2282 Engineering Calculus II (4)
   p. OR
   q. MAC 2311 Calculus I (4)
   r. and
   s. MAC 2312 Calculus II (4)
   t. OR
   u. MAC 2241 Life Sciences Calculus I (4)
   v. and
   w. STA 2023 Introductory Statistics I (4)
   x. OR
   y. PHY 2048 General Physics I (3)
   z. and
   aa. PHY 2048L General Physics I Laboratory (1)
   bb. PHY 2049 General Physics II (3)
   cc. and
   dd. PHY 2049L General Physics II Laboratory (1)
   ee. OR
   ff. PHY 2053 General Physics (3)
   gg. and
   hh. PHY 2053L General Physics Laboratory (1)
   ii. PHY 2054 General Physics (3)
   jj. and
   kk. PHY 2054L General Physics Laboratory (1)

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

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

1. Department of Biology Courses—minimum 42 credit hours
   a. BSC 2010L Biology I Cellular Processes (3)
   b. BSC 2011 Biology II Diversity (3)
   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. BOT 4503 Plant Physiology (3)
      ii. MCB 4404 Microbial Physiology and Genetics (4)
      iii. PCB 4723 Animal Physiology (3)
   g. At least one of the following: Vascular Plants (BOT 3373C), Microbiology (MCB 3020C), Vertebrate Zoology (ZOO 3203C), Comparative Vertebrate Anatomy (ZOO 3713C), Advanced Vertebrate Zoology and Lab. (ZOO 3205C)
   h. Seminar in Marine Biology (3)
   i. The remaining nine (9) credit hours to meet the minimum requirements must come from courses listed in (g) 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. OCG 6051 Geological Oceanography
      iv. OCP 6050 Physical Oceanography
      v. GLY 4734 Beaches and Coastal Environments
      vi. GEO 5177 Geographic Information Systems
      vii. ZOO 5456 + ZOO 5456L Ichthyology
      viii. MCB 5600 Applied and Environmental Microbiology
      ix. ZOO 5555C Marine Animal Ecology
      x. ZOO 4513 Animal Behavior
      xi. PCB 4674 Organic Evolution
      xii. BOT 5185C Marine Botany
      xiii. BSC 4933 Advanced Marine Biology and Lab

2. Supporting Courses in the Natural Sciences—minimum 32 credit hours
   a. CHM 2045 General Chemistry I (3)
   b. CHM 2045L General Chemistry I Laboratory (1)
   c. CHM 2046L General Chemistry II Laboratory (1)
   d. CHM 2046L General Chemistry II Laboratory (1)
   e. CHM 2210 Organic Chemistry I (3)
   f. CHM 2210L Organic Chemistry I Laboratory (2)
   g. CHM 2211 Organic Chemistry II (3)
   h. CHM 2211L Organic Chemistry II Laboratory (2)
   i. MAC 2241 Life Sciences Calculus I (4)
   j. and
   k. MAC 2242 Life Sciences Calculus II (4)
   l. OR
   m. MAC 2281 Engineering Calculus I (4)
   n. and
   o. MAC 2282 Engineering Calculus II (4)
   p. OR
   q. MAC 2311 Calculus I (4)
   r. and
   s. MAC 2312 Calculus II (4)
   t. OR
   u. MAC 2241 Life Sciences Calculus I (4)
   v. and
   w. STA 2023 Introductory Statistics I (4)
   x. OR
   y. PHY 2048 General Physics I (3)
   z. and
   aa. PHY 2048L General Physics I Laboratory (1)
   bb. PHY 2049 General Physics II (3)
   cc. and
   dd. PHY 2049L General Physics II Laboratory (1)
   ee. OR
   ff. PHY 2053 General Physics (3)
   gg. and
   hh. PHY 2053L General Physics Laboratory (1)
   ii. PHY 2054 General Physics (3)
   jj. and
   kk. PHY 2054L General Physics Laboratory (1)

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
Required Courses for the Microbiology Major

1. Department of Biology Courses—minimum 42 credit hours
   a. BSC 2010 Biology I Cellular Processes (3)
   b. BSC 2011 Biology II Diversity (3)
   c. PCB 3023 Cell Biology (3)
   d. MCB 3020C General Microbiology (4)
   e. Ten (10) hours from the following list:
      - BOT 4434C Mycology (3)
      - MCB 4502 Virology (3)
      - MCB 4910 Microbiology Undergraduate Research (1-4)
      - MCB 4934 Seminar in Microbiology (1)
      - MCB 5206 Public Health and Pathogenic Microbiology (3)
      - MCB 5655 Applied and Environmental Biology (3)
      - MCB 4115 Determinative Bacteriology (5)
      - MCB 4404 Microbial Physiology and Genetics (4)
      - MCB 4404L Microbial Physiology and Genetics Laboratory (1)
   f. A maximum of four (4) credit hours of Undergraduate Research (MCB 4910) or Biology Honors Thesis (BSC 4970) may be applied.
   g. 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 35 credit hours
   a. CHM 2045 General Chemistry I (3)
   b. CHM 2046L General Chemistry I Laboratory (1)
   c. CHM 2210L Organic Chemistry I (3)
   d. CHM 2211L Organic Chemistry II Laboratory (2)
   e. MAC 2241 Life Sciences Calculus I (4)
   f. A maximum of four (4) credit hours from Undergraduate Research (MCB 4910) or Biology Honors Thesis (BSC 4970) may be applied.

3. Liberal Arts Courses—minimum 45 credit hours

4. Free Elective Courses needed to complete 120 credit hours.

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 courses. 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.

Year 1
   BSC 2010 Biology I with lab- Honors section 4
   (CHM 2045 Pre- or Co-requisite)
   BSC 2011 Biology II with lab- Honors section 4
   BSC 4931 Selected Topics - Honors Seminar I - Introduction to Biology Research 1

Year 2
   BSC 4932 Selected Topics - Honors Seminar II - Philosophy/Ethics 3
   BSC 4933 Selected Topics - Honors Seminar III - Scientific Approaches 3

Year 3
   BSC 4910 Undergraduate Research - Biology Faculty Member’s Laboratory 2
   BSC 4933 Selected Topics - Honors Seminar IV - Biology Department Seminar 1

Credits: 8 beyond normal Biology degree (4 research credits can count towards total of 40 Biology credits)
2 beyond University Honors (HS II and HS III & Research counts toward University Honors)