• MICROBIOLOGY (MIC) (CIP = 26.0503)

TOTAL PROGRAM HOURS = 120 CREDIT HOURS

Prerequisites (State Mandated Common Prerequisites) for Students Transferring from a Florida College System Institution

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.

Prerequisites (State Mandated Common Prerequisites) for Students Transferring from a Florida College System Institution

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 X010/X010L Biology I with Lab or BSC X010C or BSC X040/040L or PCB X011C
BSC X011/X011L Biology II with Lab or BSC X011C or BSC X041/X041L or BSC X041/X041L
CHM X045/X045L General Chemistry I with Lab or CHM X045C or (CHM X040 and CHM X041)
CHM X046/X046L General Chemistry II with Lab or CHM X046C
CHM X210/X210L Organic Chemistry I with Lab and CHM X211/X211L or (CHM X210C and X211C) or (PHY X053/X053L and PHY X054/X054L) or (PHY X048/X048L and PHY X049/X049L)
MAC X311 Calculus I or MAC X233 or MAC X253 or MAC X281 or MAC X241
MAC X312 Calculus II or MAC X282 or MAC X234 or STA X023 or STA X024 or STA X321

REQUIREMENTS FOR THE MAJOR MICROBIOLOGY (B.S.)
Department of Cell Biology, Microbiology, and Molecular Biology

Minimum: 42 credit hours

1. Required courses (30 credit hours):
   a. BSC 2010 Biology I Cellular Processes
   BSC 2010L Biology I Cellular Processes Laboratory
   BSC 2011 Biology I Diversity
   BSC 2011L Biology I Diversity Laboratory
   b. PCB 3023 Cell Biology
   PCB 3023L Cell Biology Laboratory
   PCB 3063 General Genetics
   MCB 3410 Cell Metabolism
   MCB 3020 General Microbiology
   MCB 3020L General Microbiology Laboratory
   c. MCB 4115C Determinative Bacteriology
   MCB 4320 Molecular Microbiology

2. Elective Courses: [12 hours]
   BSC 4905 Independent Study*
   BSC 4933 Selected Topics in Biology*
   BOT 4434C Mycology
   MCB 4503 Virology
   MCB 4313 Industrial Microbiology
   MCB 4905 Microbiology Undergraduate Research (2 credit hours per term maximum)
   MCB 4933 Selected Topics in Microbiology
   MCB 4934 Seminar in Microbiology
   MCB 5206 Public Health and Pathogenic Microbiology
   MCB 5655 Applied and Environmental Biology
   MCB 5815 Medical Microbiology
   PCB 4234 Principles of Immunology
   BCH 3053 Introductory Biochemistry
   BCH 3023L Basic Biochemistry Laboratory
   MCB 4404 Microbial Physiology and Genetics
   MCB 4404L Microbial Physiology and Genetics Laboratory
   ZOO 4753 Human Histology and Molecular Pathology of Disease
   ZOO 4753L Human Histology and Molecular Pathology of Disease Laboratory

*Please see an Academic Advisor for appropriate selected topics courses.

A maximum of 4 credit hours of Undergraduate Research (MCB 4910) may be applied.
A minimum of 20 credit hours of courses must be taken in residency and be applicable to the major.
3. Supporting Courses in the Natural Sciences (minimum 34 credit hours):
   a. CHM 2045 General Chemistry I
      CHM 2045L General Chemistry I Laboratory
      CHM 2046 General Chemistry II
      CHM 2046L General Chemistry II Laboratory
   b. CHM 2210 Organic Chemistry I
      CHM 2210L Organic Chemistry I Laboratory
      CHM 2211 Organic Chemistry II
      CHM 2211L Organic Chemistry II Laboratory
   c. MAC 2241 Life Sciences Calculus I and MAC 2242 Life Sciences Calculus II
      or MAC 2281 Engineering Calculus I and MAC 2282 Engineering Calculus II
      or MAC 2311 Calculus I and MAC 2312 Calculus II
      STA 2023 Introductory Statistics I may be substituted for any Calculus II
   d. PHY 2048/2048L General Physics II and PHY 2094/2049L General Physics II
      or
      PHY 2053/2053L General Physics II and PHY 2054/2054L General Physics II
4. Meet all College and University requirements

**Accelerated Non-Thesis B.S./M.S. Program in Microbiology**

This program allows B.S. majors in Microbiology to take graduate courses for the elective part of the Microbiology degree and apply them to a non-thesis M.S. degree in Microbiology. Successful students will be able to earn the M.S. degree in two additional semesters beyond the completion of the B.S. degree.

This accelerated program shares 12 credits between already existing degrees/concentrations:
- B.S. in Microbiology
- M.S in Microbiology (NT)

**Target students and expected outcomes**

This program will appeal to the more competitive Microbiology majors who would benefit professionally from having the M.S. when they enter the job market but do not want to commit to the longer time a thesis M.S. or a Ph.D. program takes to complete. Professions that do not require bench laboratory experience but desire the broadened knowledge base are targeted. Graduates from this program would be ideally suited for health professions, technology based industry, education and government. We also expect that some students will be interested in doctoral education in the biological or biomedical areas.

**Description and Requirements**

Biology majors who have completed the following courses may apply to this program:
- PCB 3023 Cell Biology
- PCB 3063 Genetics
- MCB 3410 Cell Metabolism
- MCB 3032 Microbiology
- MCB 4115C Determinative Bacteriology

**Graduate Degree Requirements**

Students admitted into the M.S. portion of the program must complete all the requirements for the M.S. degree (non-thesis) within three semesters of admission. The requirement is 30 hours of graduate work with at least 16 of these hours completed at the 6000 level; 26 hours must be formally structured courses; and at least 15 hours must be in Cell, Molecular and Microbiology courses. Students will be required to take 3 core courses from the list below as part of these 26 hours. Of the required 26 hours, 9 hours will be derived from the core- Cell, Molecular and Microbiology graduate courses listed below (see associated curriculum). These requirements can be partially met by up to 12 hours of graduate courses taken as undergraduates. Any graduate class taken outside of Cell, Molecular and Microbiology must be approved by the Cell, Molecular and Microbiology Graduate Director. Students should be aware that a B grade or better is required for every graduate class applied to the M.S portion of their degree. In addition, students will be required to pass an oral qualifying exam based on a review paper submitted in their final semester. Students must form a committee as part of their action plan to complete their graduate work. This committee will be comprised of at least 3 Cell, Molecular and Microbiology faculty, and will serve as the examination committee for the review paper required as part of the MS portion of their degree. Upon approval of that paper, students must successfully complete a comprehensive oral exam by their committee.

**Timeline and benchmarks:**
1. Completion of prerequisite upper division courses and application to the accelerated program. Typically students will be in their junior year.
2. Acceptance into the program and an action plan within a semester of application.

3. Students will take up to 12 credits of graduate credit in Cell, Molecular and Microbiology courses following acceptance into the program. Typically, these courses will be taken in the latter half of the junior year and in the senior year. BioAdvise will monitor the progress of the students and ensure they follow their action plan. Students who do not complete at least 9 hours of graduate work by graduation will be dropped from the accelerated M.S. program.

4. GRE exams will be taken in a timely manner so scores will be available for admission to the M.S. portion of the program. Students who do not complete the GRE in time will not be admitted to the accelerated M.S. program.

5. Students admitted to the accelerated program must form a committee prior to the beginning of their first semester in the M.S. portion of the program and must continue to follow the action plan which will be monitored by BioAdvise.

6. Students admitted to the accelerated M.S. program must complete the requirements within three semesters or will be dismissed from the program.

**Year 1**
- BSC 2010 Cellular Processes
- BSC 2010L Cellular Processes Laboratory
- BSC 2011 Diversity
- BSC 2011L Diversity Laboratory

**Year 2**
- MCB 3410 Cell Metabolism
- PCB 3063 General Genetics
- PCB 3063L General Genetics Laboratory
- PCB 3023 Cell Biology
- PCB 3023L Cell Biology Laboratory
- MCB 3032C General Microbiology

**Year 3**
- MCB 4115C Determinative Bacteriology

  Three (3) credit hours of 5000-level elective structured course

**Year 4**
- MCB 4320 Molecular Microbiology

  Nine (9) credit hours of 5000- or 6000-level elective courses

**Year 5**
- Eighteen (18) hours of graduate coursework - 9 hours of which must be derived from the list below:
  - BSC 6932 Selected Topics in Biology
  - PCB 6236 Advanced Immunology
  - PCB 6525 Molecular Genetics
  - MCB 5206 Public Health and Pathogenic Microbiology
  - MCB 5655 Applied and Environmental Microbiology
  - MCB 5815 Medical Mycology

  Four (4) credit hours of non-structured courses (seminar, independent study, laboratory research)

  Oral exam and review paper done at the end of Year 5

**Comprehensive Oral Qualifying Examination.**
A final comprehensive oral examination is required for all master’s students. This examination is open to all departmental faculty. Students must take their comprehensive exam within two years of matriculation and the exam is normally taken after the completion of all formal course work. Thesis students must take the examination at least one semester before the thesis is presented. Any graduate work counted toward the requirement for the M.S. degree must be completed within five (5) years after matriculation.

**Requirements for the Minor in Microbiology (MIC)**

The minor in Microbiology consists of 26 credit hours, which include:

**Required Courses:**
- BSC 2010 Biology I Cellular Processes
- BSC 2010L Biology I Cellular Processes Laboratory
- PCB 3023 Cell Biology
- PCB 3023L Cell Biology Laboratory
- PCB 3063 General Genetics
- MCB 3410 Cell Metabolism or BCH 3023 Biochemistry
- MCB 3020C General Microbiology
- MCB 4115C Determinative Bacteriology
MCB 4320 Molecular Microbiology
A grade of C- is the minimum acceptable grade for courses in the minor. A minimum 2.0 average in the 26 credits is required for obtaining this degree.

Cell Biology, Microbiology and Molecular Biology Faculty

Integrative Biology Faculty
Chairperson: P. Stiling; Professors: S. Bell, T. Crisman, E. McCoy, P. Motta, H. Mushinsky, S. Pierce, P. Stiling; Associate Professors: S. Deban, G. Fox, V. Harwood, J. Rohr, K. Scott; Assistant Professors: M. Lajeunesse, D. Lewis, L. Martin, C. Richards; Instructors: C. Osovitz, B. Predmore