

Advising the Pre-Medical Biology Major at The Citadel

SC Medical School pre-requisite coursework is detailed in Appendix A below; pre-requisites for other medical schools may be found on each school's admissions web page or compiled in the two manuals below.

1. For all MD Medical Schools: [MSAR](#) – published by the Association of American Medical Colleges
2. For all DO Medical Schools: [Student Guide to Osteopathic Medical Colleges](#) – Published by the American Association of Colleges of Osteopathic Medicine

The Citadel's curriculum for Biology Majors has most medical school pre-requisite courses included. Students should try to incorporate electives from the list below when possible, depending on the pre-requisites of the medical schools they hope to attend and on The Citadel course offerings as [published by the Registrar](#) and on the Biology Department's [course rotation schedule](#).

In Appendix B, please find a sample pre-medical student's 4-year schedule; it is just a template; it is ***not*** required that pre-med students follow this sample schedule.

***Suggested General Electives:**

- Psychology (PSYC 201)
- Sociology (SOCI 201)
- Medical Terminology (EXSC 317)
- Anatomy and Physiology (BIOL 217, 218)

***Suggested Biology Electives:**

- Microbiology (BIOL 290)
- Biochemistry I and II (CHEM 409/410)
- Comparative Anatomy (BIOL 302)
- Intern Research (BIOL 320)
- Undergraduate Research (BIOL321-324)
- Histology (BIOL 402)
- Mammalian Physiology (BIOL 403)
- Developmental Biology (BIOL 401)
- Immunology (BIOL 427) – occasionally may be offered as an online summer course
- Molecular Genetics (BIOL 424)

Appendix A

Science and Math Pre-Requisites to Take Before Applying to Medical School

Most medical schools require or recommend the following undergraduate science and math courses: Biology, Chemistry, Physics, Organic Chemistry, Calculus, and Biochemistry. **Some additional coursework may be required for some medical schools**; check with each school to get its exact list of prerequisites.

For the Four SC Medical Schools:

1. **MUSC** – Although no prerequisite courses are required, in order to perform successfully in our curriculum, MUSC strongly recommends that the following courses be completed at the time of matriculation:
 - 2 semesters General Biology with lab
 - 2 semesters General Inorganic Chemistry with lab
 - 1 to 2 semesters Organic Chemistry with lab
 - 1 to 2 semesters Physics with lab

MUSC also suggests that coursework exposing students to the following disciplines may be useful:

- Biochemistry
- Anatomy
- Cell Biology
- Embryology
- Genetics
- Physiology
- Immunology
- Statistics
- College level Mathematics
- Courses involving intensive writing experiences

Online courses from an accredited college or university may be acceptable. However, applicants who have successfully completed science coursework in a formal classroom setting will be deemed more competitive in the selection process than students who completed these courses in online programs.

2. **USC SOM (Columbia)** - While the School of Medicine does not have any prerequisite requirements, for most applicants a strong preparation in the natural sciences is highly recommended including general biology, general chemistry, organic chemistry, and biochemistry. Further advanced studies in the biological, physical and/or chemical sciences is encouraged.
3. **USC SOM-Greenville**
Required:
 - Two semesters of biology with lab. If using AP or IB credit, an additional semester in advanced biology such as cell biology, genetics, physiology, or molecular biology is required
 - Two semesters of general inorganic chemistry with lab
 - One semester of organic chemistry with lab (a second semester of organic chemistry with lab is only required if a prerequisite for biochemistry)
 - One semester of biochemistry, lab is not required
 - One semester of physics with lab
 - Three semesters of humanities, social and behavioral sciences (including at least one semester of English composition/literature). AP or IB credit acceptable to the applicant's undergraduate college is allowed for a maximum of two semesters

Recommended:

- Cell biology
 - Genetics
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- For [USC SOM-Greenville](#), Advanced Placement (AP) and International Baccalaureate (IB) credits acceptable to your undergraduate college may be used to satisfy prerequisites as long as the courses appear on your official transcript. However, it is advisable to take upper level courses which evidence your ability to successfully complete more rigorous academic material.
 - Courses taken at the community/technical college level will satisfy prerequisites. In order to be competitive in the selection process, we encourage applicants with community college prerequisites to supplement these courses by taking advanced courses in related subjects at a four year college. Applicants who have taken the required courses at a four-year college and have done well are generally deemed more competitive in the selection process.
 - Online courses from an accredited college or university may be acceptable. However, the admissions committee values much more highly those courses taken in the classroom setting. Applicants who have successfully completed required courses in the classroom will be deemed more competitive in the selection process. For the 2020-2021 admissions cycle, students who do not receive grades during this semester, we will accept pre-requisites as pass/fail courses and online labs to meet the requirements if they were taken during a semester when your University offered online-only schedules for health and safety reasons.
 - Extension or evening courses taken in fulfillment of premedical course requirements are not acceptable unless they are identical to courses offered in the undergraduate college's regular academic program.
 - Prerequisites do not need to be completed to apply but must be successfully completed prior to matriculation. Until documentation of successful completion of the requirements is received, acceptance is considered conditional.
 - All coursework submitted in fulfillment of admission requirements must be evaluated on the basis of a traditional grading system which employs a range of numbers or letters to indicate the comparative level of performance.
4. [VCOM-Carolinas](#) (This is a DO school in Spartanburg)
Applicants must have completed 90 hours or three-fourths of the required credits for a baccalaureate degree and have completed the required courses listed below from a college or university accredited by a regional accrediting body:
- Biological Sciences: 4 credit hours
 - Physics: 6 credit hours
 - General and Inorganic Chemistry: 6 credit hours
 - Organic Chemistry: 6 credit hours
 - English and Composition: 6 credit hours
 - A minimum of 6 additional biomedical science credit hours at the 200 level or above, which prepare the applicant for medical school. These include anatomy, physiology, biochemistry, immunology, microbiology, virology, or genetics.

A "C" is the minimum grade needed for all required courses. However, a "B" or better is generally needed for acceptance. Courses with equivalent content will be considered. VCOM follows the AACOMAS definition of science courses to determine science GPA and science hours. See the AACOMAS website for more information.

Appendix B

Biology Major Sample Four-Year Schedule for Pre-Medical Students who Matriculated 2019 or Later

FRESHMAN YEAR (Fall)

First Year Experience - LDRS 101
Freshman Seminar - FSEM 101
Freshman Linked Writing Intensive - FSWI 101
Physical Fitness, Resiliency, and Wellness - RPED 260
Introduction to Biology II - BIOL 140
Introduction to Biology II Laboratory - BIOL 141
General Chemistry I - CHEM 151
General Chemistry I Laboratory - CHEM 161
1st Year Basic ROTC - 101 (MLTY/NAVL/AERO)

FRESHMAN YEAR (Spring)

Introduction to Biology I - BIOL 130
Introduction to Biology I Laboratory - BIOL 131
General Chemistry II - CHEM 152
General Chemistry II Laboratory - CHEM 162
Statistical Methods - STAT 160
Modern Language - determined by placement exam
1st Social Science Elective - PSCY 201 or SOCI 201
1st Year Basic ROTC - 102 (MLTY/NAVL/AERO)

SOPHOMORE YEAR (Fall)

Sophomore Seminar in Principled Leadership - LDRS 201
(211 may be taken either sophomore semester) - LDRS 211 0 (0,1)
Evolution - BIOL 208
Organic Chemistry I - CHEM 207
Organic Chemistry I Laboratory - CHEM 217
Applied Calculus I - MATH 106
2nd Social Science Elective - PSCY 201 or SOCI 201
Modern Language - determined by placement exam
2nd Year Basic ROTC - 201 (MLTY/NAVL/AERO)

SOPHOMORE YEAR (Spring)

Cell Biology - BIOL 210
Cell Biology Laboratory - BIOL 211
Organic Chemistry II - CHEM 208
Organic Chemistry II Laboratory - CHEM 218
Applied Calculus II - MATH 107
Strand History - HISS 30x
Technical Writing and Communication - COMM 260
2nd Year Basic ROTC - (MLTY/NAVL/AERO)

REQUIRED FOR GRADUATION: 131-137 credit hours plus successful completion of all RPED, ROTC, and LDRS graduation requirements. ROTC hours (credits, lectures, and labs) vary each semester by military department.

Biology Major Sample Four-Year Schedule for Pre-Medical Students who Matriculated 2019 or Later

JUNIOR YEAR (Fall)

Junior Ethics Enrichment Experience - LDRS 311
Leadership in Organizations - LDRS 371
Strand English - ENGS 30x
Strand Natural Science - NTSS 30x
Genetics - BIOL 308
College Physics I - PHYS 203
College Physics I Laboratory - PHYS 253
1st Year Advanced ROTC - [ROTC Fulfillment](#) course or MLTY/NAVL/AERO

JUNIOR YEAR (Spring) Take the MCAT at the end of this semester

General Elective - any elective or BIOL 217 and 227 (this is the only way to fit in A&P)
Ecology - BIOL 406
Biology Elective** - BIOL xxx take one of the recommended BIOL courses for pre-meds* (p. 1)
College Physics II - PHYS 204
College Physics II Laboratory - PHYS 254
Biochemistry I - CHEM 409 - this is the best time to take Biochemistry
Required Physical Education - RPED
1st Year Advanced ROTC - BIOL 321 [ROTC Fulfillment](#) course or MLTY/NAVL/AERO

SENIOR YEAR (Fall)

Senior Leadership Integration Seminar - LDRS 411
Biology Senior Seminar - BIOL 411
Biology Elective** - BIOL xxx take one of the recommended BIOL courses for pre-meds* (p. 1)
Biology Elective** - BIOL xxx be sure you have one biology elective from each group for graduation**
Strand Elective - ELES 30x
Elective - any elective or BIOL 218 and 228
Elective - any elective or EXSC 317
2nd Year Advanced ROTC - BIOL 322 [ROTC Fulfillment](#) course or MLTY/NAVL/AERO

SENIOR YEAR (Spring)

General Education Capstone - GEND 422
Biology Elective** - BIOL xxx take one of the recommended BIOL courses for pre-meds* (p. 1)
- be sure you have one biology elective from each group for graduation **
Strand Social Science - SCSS 30x
General Elective - any elective or take one of the recommended courses for pre-meds* (p. 1)
Required Physical Education - RPED
2nd Year Advanced ROTC - BIOL 323 [ROTC Fulfillment](#) course or MLTY/NAVL/AERO

**For Biology Electives, be sure to take at least one course from each of the 4 groups below

1. **Cell and Molecular Biology Courses:** BIOL 290 Microbiology, BIOL 340 Pathophysiology, BIOL 341 Pharmacology, BIOL 401 Developmental Biology, BIOL 402 Descriptive Histology, BIOL 424 Molecular Genetics, or BIOL 427 Immunology
2. **Ecology and Field Biology Courses:** BIOL 314 Vascular Flora of South Carolina, BIOL 408 Ornithology, BIOL 409 Marine Biology, BIOL 410 Vertebrate Natural History, or BIOL 426 Freshwater Biology
3. **Organismal Biology Courses:** BIOL 203 Survey of the Plant Kingdom, BIOL 208 Evolution, BIOL 301 Invertebrate Zoology, BIOL 302 Comparative Vertebrate Anatomy, BIOL 309 Animal Behavior, BIOL 410 Vertebrate Natural History, BIOL 419 Economic Botany, or BIOL 421 Toxicology
4. **Physiological Biology Courses:** BIOL 403 Mammalian Physiology or BIOL 414 Environmental Physiology

Biology Major Sample Four-Year Schedule for Pre-Medical Students who Matriculated Prior to 2019**FRESHMAN YEAR (Fall)**

Introduction to Biology I.....	BIOL 130
Introduction to Biology I Laboratory.....	BIOL 131
General Chemistry I.....	CHEM 151
General Chemistry I Laboratory.....	CHEM 161
Composition and Literature.....	ENGL 101
1 st Social Science Elective.....	PSCY 201 or SOCI 201
First Year Seminar.....	LDRS 101
Required Physical Education.....	RPED 250
+1st Year Basic ROTC.....	101 (MLTY/NAVL/AERO)

FRESHMAN YEAR (Spring)

Introduction to Biology II.....	BIOL 140
Introduction to Biology II Laboratory.....	BIOL 141
General Chemistry II.....	CHEM 152
General Chemistry II Laboratory.....	CHEM 162
Composition and Literature.....	ENGL 102
Statistical Methods.....	STAT 160
Required Physical Education.....	RPED 251
+1st Year Basic ROTC.....	102 (MLTY/NAVL/AERO)

SOPHOMORE YEAR (Fall)

Evolution.....	BIOL 208
Organic Chemistry I.....	CHEM 207
Organic Chemistry I Laboratory.....	CHEM 217
Major British Writers.....	ENGL 201
Applied Calculus I.....	MATH 106
Required Physical Education.....	RPED
+2nd Year Basic ROTC.....	(MLTY/NAVL/AERO)
Sophomore Seminar.....	LDRS 201
(211 may be taken either semester).....	LDRS 211
2 nd Social Science Elective.....	PSCY 201 or SOCI 201

SOPHOMORE YEAR (Spring)

Cell Biology.....	BIOL 205
Organic Chemistry II.....	CHEM 208
Organic Chemistry II Laboratory.....	CHEM 218
English, American, or World Literature.....	ENGL 202 or 215 or 218 or 219
Applied Calculus II.....	MATH 107
Biology Ecology/Field Elective	BIOL 209 or 314 or 407 or 408 or 409 or 426
Required Physical Education.....	RPED
+2nd Year Basic ROTC.....	(MLTY/NAVL/AERO)

REQUIRED FOR GRADUATION: 131-137 credit hours plus successful completion of all RPED, ROTC, and LDRS graduation requirements. ROTC hours (credits, lectures, and labs) vary each semester by military department.

Biology Major Sample Four-Year Schedule for Pre-Medical Students who Matriculated Prior to 2019**JUNIOR YEAR (Fall)**

Genetics.....	BIOL 308
Biology Elective**	BIOL 302 or 401 or 402 or 403 or 427
College Physics I.....	PHYS 203
College Physics I Laboratory.....	PHYS 253
History of Western or World Civilization.....	HIST 104 or 105
A Modern Language.....	
Biochemistry I.....	CHEM 409
+1st Year Advanced ROTC.....	LDRS 371 ROTC Fulfillment course or MLTY/NAVL/AERO
Junior Ethics Enrichment Experience.....	LDRS 311

JUNIOR YEAR (Spring)

Ecology.....	BIOL 406
Elective.....	any elective; BIOL 217 and 227; or BIOL 290, 340, or 341
College Physics II.....	PHYS 204
College Physics II Laboratory.....	PHYS 254
History of Western or World Civilization.....	HIST 104 or 105
A Modern Language.....	
Biochemistry II.....	CHEM 410
+1st Year Advanced ROTC	BIOL 321 ROTC Fulfillment course or MLTY/NAVL/AERO

SENIOR YEAR (Fall)

Biology Senior Seminar.....	BIOL 411
Biology Elective**	BIOL 302 or 401 or 402 or 403 or 427
Biology Elective**	BIOL 302 or 401 or 402 or 403 or 427
A Modern Language.....	
Elective.....	any elective or BIOL 218 and 228
Elective.....	any elective or EXSC 317
Senior Leadership Integration Seminar.....	LDRS 411
+2nd Year Advanced ROTC.....	BIOL 322 ROTC Fulfillment course or MLTY/NAVL/AERO

SENIOR YEAR (Spring)

Biology Elective**	BIOL 290 or 340 or 341
A Modern Language.....	
Elective.....	any elective or BIOL 290, 340, or 341
Elective.....	any elective or BIOL 290, 340, or 341
+2nd Year Advanced ROTC.....	BIOL 323 ROTC Fulfillment course or MLTY/NAVL/AERO

**For Biology Electives, be sure to take at least one course from each of the 4 groups below

1. **Cell and Molecular Biology Courses:** BIOL 290 Microbiology, BIOL 340 Pathophysiology, BIOL 341 Pharmacology, BIOL 401 Developmental Biology, BIOL 402 Descriptive Histology, BIOL 424 Molecular Genetics, or BIOL 427 Immunology
2. **Ecology and Field Biology Courses:** BIOL 314 Vascular Flora of South Carolina, BIOL 408 Ornithology, BIOL 409 Marine Biology, BIOL 410 Vertebrate Natural History, or BIOL 426 Freshwater Biology
3. **Organismal Biology Courses:** BIOL 203 Survey of the Plant Kingdom, BIOL 208 Evolution, BIOL 301 Invertebrate Zoology, BIOL 302 Comparative Vertebrate Anatomy, BIOL 309 Animal Behavior, BIOL 410 Vertebrate Natural History, BIOL 419 Economic Botany, or BIOL 421 Toxicology
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