A major in Biological Sciences is designed to offer you rigorous exposure to the modern experimental disciplines within biology. Our curriculum is designed to provide broad training from which you can pursue a career, professional school or graduate school in a range of areas. In the introductory courses you will clone genes, characterize enzymes, and use computers to simulate the effects of environmental stress on the population growth of organisms. With the help of faculty members, you will choose from these Biological Sciences specializations for your advanced program:

**Cell Biology and Genetics (CEBG)** – emphasizes cellular biology of animals, plants and microbes and examines cellular structures and functions, and mechanisms of heredity and gene expression. This specialization, along with the biochemistry major, provides an excellent foundation for work in the growing field of biotechnology.

**Ecology and Evolution (ECEV)** – focuses on the interaction of organisms with their environment and the evolutionary adaptations that allow organisms to fill specific environmental niches.

**General Biology (GENB)** – provides broad training in biology at the cellular and organismal levels; prepares students for careers, graduate school, and the health professions.

**Microbiology (MICB)** – examines the role of bacteria and viruses in disease, generation of the immune response to infections, gene replication and expression, cellular metabolism, and application of microbiological principles to genetic engineering.

**Physiology and Neurobiology (PHNB)** – investigates the structure and function of organisms from the cellular to the system level of organization. The curriculum includes courses in physiology and cellular biology.

**Individualized Studies (BIVS)** – BIVS allows students to combine the rigors of a Biological Sciences degree with interdisciplinary studies. BIVS students can integrate studies in biology with fields such as mathematics, physics, linguistics, or psychology. BIVS is reserved for students with truly interdisciplinary interests, and requires a written plan of study approved by the Assistant Dean of Undergraduate Academic Programs.

**CHEMISTRY (CHEM) & BIOCHEMISTRY (BCHM)**
Chemistry is the central science—it bridges with physics and materials science, with the biological sciences and medicine, and with the earth and planetary sciences. Chemists and biochemists work on new product development and testing, measurements for standardization, and development of new analytical techniques. Environmental chemists measure toxins in the environment, conduct research into the biochemical reaction mechanisms of possible pollutants, and provide insights into the development of new compounds that are less toxic to humankind and the environment. Many students with degrees in chemistry or biochemistry choose to pursue an advanced degree in graduate school, or to attend medical, dental, pharmacology, or veterinary schools.

**ENVIRONMENTAL SCIENCE AND POLICY (ENSP)**
ENSP provides an integrative multidisciplinary framework for understanding the environment and emerging global challenges through the intersection of science, social systems, and policy. Students who concentrate in **Biodiversity and Conservation Biology** study the biological principles that influence the diversity of life, with a focus on the disciplines of ecology and evolution, and the processes that create and reduce biological diversity. Students who concentrate in **Environmental Geosciences and Restoration** study the emerging discipline of environmental restoration with core sciences.
ASTRONOMY (ASTR)
A degree in Astronomy can launch you on a successful pursuit of the answers to mysteries humans have pondered for ages. In addition to astronomy, our students are given a strong education in math and physics. They are also strongly encouraged to do research with our faculty, who have access to world class facilities; they make discoveries with space missions, space telescopes, and ground-based telescopes around the world, or use state-of-the-art computational facilities to push theoretical simulations to their limits. Our graduates go on to fulfilling careers in research, education, government and industry, working in observatories, museums, etc.

ATMOSPHERIC AND OCEANIC SCIENCE (AOSC)
Our major explores the most complex environmental issues faced by modern society. With a strong background in the fundamentals of meteorology and oceanography, as well as physics, chemistry and math, our graduates pursue graduate studies and/or go on to such diverse jobs as government researchers at NASA and NOAA, forecasters for private companies and the government, disaster risk consultants for insurance companies, and forecasters for the evening news. The program also places a heavy emphasis on research; a senior thesis based on original research of the student’s chosen topic is the capstone graduation requirement.

COMPUTER SCIENCE (CMSC)
The Computer Science major is for the academically curious student who wants to explore all the ways they can create something new with a computer. In the first half of the program, students receive a strong education in the foundations of how the computer works in both theory and practice; then in the second half of their education, students are able to tailor their studies in the direction in which they want to go as professionals, based on their strengths and interests.

GEOLOGY (GEOL)
Geological studies encompass all the physical, chemical and biological aspects of the Earth. Geologists study the Earth’s internal and surficial structure and materials, the chemical and physical processes acting within and on the Earth, and utilize the principles of all of the natural sciences to understand our planet and its environments. Geologists take a holistic approach in the collection and interpretation of data about the Earth through study of the Earth as a system. They are concerned with geology and geophysics, hydrology, oceanography and marine science, meteorology and atmospheric science, planetary science, and soil science. Our graduates are employed by a myriad of governmental, industrial and academic organizations.

MATHEMATICS (MATH)
Mathematics is one of the oldest and most fundamental sciences. Mathematicians use mathematical theory, computational techniques, algorithms, and the latest computer technology to solve economic, scientific, engineering, and business problems. The Department of Mathematics educates its majors in a broad range of modern mathematics while instilling in them a strong ability to solve problems, apply mathematics to other areas, and create rigorous mathematical arguments. The program prepares the majors to further their mathematical education in graduate school, or to teach at the secondary school level, or to work in government or business.

PHYSICS (PHYS)
Physics students enjoy both the benefits of a large research university and the supportive environment of a close-knit department. With small class sizes, our internationally recognized faculty get to know each of our majors individually. In addition to being excellent teachers, these faculty believe that the most important physics education occurs outside the classroom, and all of our majors are encouraged to participate in cutting-edge research. Many of our graduates continue to study physics in graduate school; others go to work in fields such as engineering, software development, law, business or education.
CMNS
Contact Information
cmns.umd.edu

CMNS Undergraduate Student Services Office
(Home office for all student concerns)
1300 Symons Hall
301.405.2080

DEPARTMENT OFFICES

Astronomy
Dr. Melissa Hayes-Gehrke
301.405.1562
mhayesge@umd.edu
1208C Physical Sciences Complex

Atmospheric & Oceanic Science
Dr. Tim Canty
301.405.5360
tcanty@atmos.umd.edu
3427 Atlantic Building

Biochemistry and Chemistry
Dr. Michael Montague-Smith
301.405.1791
mpms@umd.edu
1206 Chemistry Building

Biology
Dr. Reid Compton
301.405.6916
compton@umd.edu
1204F Biology-Psychology Building

Cell Biology and Molecular Genetics
Dr. David Straney
301.405.1622
straney@umd.edu
2222 H.J. Patterson Hall

Computer Science
CS Undergraduate Advising
301.405.2672
ugrad@cs.umd.edu
Check-In Desk:
First Floor of Iribe Center

Entomology
Dr. Bretton Kent
301.405.3125
bkent@umd.edu
3142 Plant Sciences Building

Geology
Dr. John Merck
301.405.4379
jmerck@umd.edu
1119 Geology Building

Mathematics
Ms. Ida Chan
301.405.7582
ichan@umd.edu
1115 Kirwan Hall

Physics and Physical Sciences
Mr. Tom Woycheck-Gleason
301.405.5979
tgleason@umd.edu
1120 Toll Physics Building

CMNS Undergraduate Student Services Office
(Home office for all student concerns)
Limited Enrollment Program (LEP) Benchmarks

You are expected to complete the following courses with a C- or better. For **freshman direct admits**, these courses must be completed by the **end of your third and fifth semesters** in the major. For **internal and external transfers**, these courses must be completed by the **end of your second semester** in the major.

**Failure to meet benchmark requirements will lead to dismissal from the major.**

<table>
<thead>
<tr>
<th>Major</th>
<th>First Benchmark (Gateway Courses)</th>
<th>Second Benchmark</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOLOGICAL SCIENCES</td>
<td>MATH 135 OR MATH 140&lt;br&gt;BSCI 160, 161, 170, 171&lt;br&gt;TWO SEMESTERS OF CHEMISTRY WITH LAB*</td>
<td>MATH 135 &amp; 136 OR MATH 140 &amp; 141 OR MATH 140 &amp; 135; AND&lt;br&gt;BSCI 207, 222&lt;br&gt;TWO ADDITIONAL SEMESTERS OF CHEMISTRY WITH LAB*</td>
</tr>
<tr>
<td>BIOCHEMISTRY AND CHEMISTRY</td>
<td>MATH 140, 141&lt;br&gt;TWO SEMESTERS OF CHEMISTRY WITH LAB*</td>
<td>PHYS 161 OR PHYS 141&lt;br&gt;BSCI 170, 171&lt;br&gt;TWO ADDITIONAL SEMESTERS OF CHEMISTRY WITH LAB*</td>
</tr>
<tr>
<td>COMPUTER SCIENCE</td>
<td>CMSC 131, 132&lt;br&gt;MATH 140</td>
<td>CMSC 216, 250, 330, 351&lt;br&gt;STAT4XX OR MATH/STAT/AMSC WITH MATH 141 AS PRE-REQ</td>
</tr>
<tr>
<td>ENVIRONMENTAL SCIENCES AND POLICY</td>
<td>MATH 120 OR 140&lt;br&gt;BSCI 160, 161 OR BSCI 170, 171&lt;br&gt;CHEM 131, 132&lt;br&gt;ENSP 101, 102</td>
<td>BSCI 160, 161, 170, 171&lt;br&gt;CHEM 231, 232&lt;br&gt;MATH 141 OR 221</td>
</tr>
</tbody>
</table>

* FOR SPECIFIC CHEMISTRY COURSES VISIT THE DEPARTMENTAL WEBSITES:
  BIOLOGICAL SCIENCES ([bsci.umd.edu/benchmarks](bsci.umd.edu/benchmarks))
  CHEMISTRY AND BIOCHEMISTRY ([chem.umd.edu/undergraduateprogram/current-students](chem.umd.edu/undergraduateprogram/current-students))

**PLEASE NOTE (see lep.umd.edu)**

- Only one gateway or performance review course may be repeated to earn the required grade and that course may only be repeated once.
- When more than one course can satisfy a gateway requirement, taking a second course from the list will count as a repeat.
- Students may apply only once to an LEP. Students who are directly admitted and fail to meet the performance review criteria will be dismissed from the major and may not reapply.
- Students must maintain a minimum cumulative GPA of 2.0. Failure to do so will result in dismissal from the major.
- Any student denied admission or dismissed from the major may appeal in writing directly to the Associate Dean for Undergraduate Education – 2300 Symons Hall.
# Benchmarks

You are expected to complete the following Benchmark courses with a C- or better. These courses must be completed by the end of your second and fourth semesters in the major.*

Failure to meet benchmark requirements will lead to dismissal from the major.

<table>
<thead>
<tr>
<th>Major</th>
<th>Second Semester Benchmarks</th>
<th>Fourth Semester Benchmarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTRONOMY</td>
<td>ASTR 120, 121 MATH 140</td>
<td>MATH 141 PHYS 171, 174, 272 MATH 241</td>
</tr>
<tr>
<td>ATMOSPHERIC &amp; OCEANIC SCIENCE</td>
<td>PHYS 161 OR 171 CHEM 135 AND CHEM 132 OR 136 MATH 140, 141 AOSC 200, 201</td>
<td>MATH 241, 246 PHYS 272, 273, 275 COMPUTER PROGRAMMING COURSE TWO 400-LEVEL AOSC COURSES</td>
</tr>
<tr>
<td>GEOLOGY - ALL TRACKS</td>
<td>TWO ADDITIONAL GEN ED COURSES FOUR 3-4 CREDIT MAJOR COURSES</td>
<td>MATH 140, 141 PHYS 141 OR PHYS 161/174 TWO 3-4 CREDIT MAJOR COURSES</td>
</tr>
<tr>
<td>MATH - APPLIED TRACK</td>
<td>MATH 140, 141</td>
<td>MATH 240, 241, 246, 310 COMPUTER SCIENCE REQUIREMENT</td>
</tr>
<tr>
<td>MATH - TRADITIONAL TRACK</td>
<td>MATH 140, 141</td>
<td>MATH 240, 241, 310 COMPUTER SCIENCE REQUIREMENT</td>
</tr>
<tr>
<td>MATH - STATISTICS TRACK</td>
<td>MATH 140, 141 MECHANICAL ENGINEERING COURSES</td>
<td>MATH 240, 241, 310 COMPUTER SCIENCE REQUIREMENT</td>
</tr>
<tr>
<td>MATH - SECONDARY</td>
<td>MATH 140, 141 THREE GEN ED COURSES</td>
<td>MATH 240, 241, 310 COMPUTER SCIENCE REQUIREMENT</td>
</tr>
<tr>
<td>EDUCATION TRACK</td>
<td>MATH 140, 141 THREE GEN ED COURSES</td>
<td>MATH 240, 241, 310 COMPUTER SCIENCE REQUIREMENT</td>
</tr>
<tr>
<td>PHYSICS</td>
<td>PHYS 171, 174 MATH 140, 141</td>
<td>PHYS 272, 273, 274**, 275, 276 MATH 241, 246</td>
</tr>
<tr>
<td>PHYSICS - EDUCATION TRACK</td>
<td>ENGL 101 PHYS 171, 174 MATH 140, 141</td>
<td>PHYS 272, 273, 275, 276 MATH 241, 246</td>
</tr>
<tr>
<td>PHYSICS - METEOROLOGY TRACK</td>
<td>PHYS 171, 174 MATH 140, 141</td>
<td>PHYS 272, 273, 275, 276 MATH 241, 246</td>
</tr>
</tbody>
</table>

* THE SIXTH SEMESTER (90 CREDITS) BENCHMARK COURSES FOR MATH MAJORS ARE MATH 410 AND TWO 400-LEVEL AMSC/MATH/STAT COURSES.

**STUDENTS PLANNING TO COMPLETE SECOND MAJORS THAT REQUIRE MATH 246 AND MATH 240/461 CAN SUBSTITUTE THESE COURSES FOR PHYS 274. HOWEVER, PHYSICS MAJORS ARE ENCOURAGED TO COMPLETE PHYS 274.
Student Organizations

PEER MENTORS

We’re available to:
• Assist you in developing four year plans
• Direct you to internship and career information in the Peer Mentor Office
• Discuss course content and selection
• Help you with course scheduling and registration
• Teach UNIV100

To learn more about us, visit our website at: cmns.umd.edu/peermentors or e-mail: peermentorsumd@gmail.com.

Facebook: facebook.com/peer.mentors.5
Twitter: @cmnspeermentors

We’re located in the Peer Mentor Office, 1317 Symons Hall.

HEALTH PROFESSIONS ADVISING OFFICE (HPAO)
STUDENT ADVISORY BOARD

The HPAO Student Advisory Board is a group of pre-health students at the University of Maryland who are pursuing careers in medicine, dentistry, and a variety of other health professions. These students are here to help other pre-health students based on their experience regarding classes, applications, interviews, and more.

Want to contact an advisory board member? Visit the HPAO (1210 H. J. Patterson) during their office hours. SAB members are only available in the Fall/Spring semesters. Their office hours will be posted in late August.

For more information, visit: prehealth.umd.edu/aboutus/sab
CMNS UNDERGRAD NEWS

- An email-based newsletter that provides information on important dates and deadlines, updated advising information, specific internship opportunities, student organizations, and much more.
- To subscribe, send an email to: listserv@listserv.umd.edu. In the text area write: subscribe CMNS UNDERGRAD NEWS your name.
- Students new to the university and CMNS should automatically receive CMNS undergrad news.

PREHEALTH ADVISING

- The Health Professions Advising Office (prehealth.umd.edu) shares important information on their listserv such as event announcements, internship and volunteer opportunities, healthcare news, health school testing information, academic advising, and student organization updates. To subscribe, send an email to: listserv@listserv.umd.edu. In text area write: subscribe premedadvising your name. Leave the subject line blank.
- Follow their social media pages: Facebook (Umd Hpao & The Reed Yorke Health Professions Advising Office page), Twitter (@UMDHPAO) and linkedin (Reed York Health Professions Advising)

RESEARCH OPPORTUNITIES

Each department in the College offers opportunities for students to gain research experience and earn academic credit under the mentorship of a faculty member. There are many off-campus research opportunities as well. Students who wish to pursue longer-term independent projects may apply to departmental honors programs.

INTERNSHIPS

An internship is an extracurricular experience that offers a strong educational component in addition to offering practical training in a particular field.

Experiences common for CMNS students include research internships, clinical internships, industry positions, science education, and community service. Internships can be either on- or off-campus.

- For more information on finding an internship, contact your academic advisor, talk with one of the Peer Mentors in 1317 Symons Hall, email excels@umd.edu, or visit cmns.umd.edu/undergraduate/research-internships.

TERRAPIN TEACHERS SEMINARS

- Explore STEM teaching as a career—a new and innovative approach to teacher preparation
- 1-credit seminars
- Seminar 1 TLPL101 Inquiry Teaching of STEM in Elementary School
- Seminar 2 TLPL102 Inquiry Teaching of STEM in Middle School
- For more information, visit terrapinteachers.umd.edu

UNIVERSITY CAREER CENTER @ CMNS

Whether you are a student who knows exactly what you want to do after college or you are still exploring many different career options, career exploration during college provides an opportunity to think about what applications of your college learning will be most satisfying to you after college. In addition to the campus-wide University Career Center & The President’s Promise, there’s also someone just for you in CMNS!

Rachel Wobrak ’05
Program Director, CMNS
1320 Symons Hall
rwobrak@umd.edu | 301-314-7242
Campus Resources

Tutoring and Academic Support Resources

- [cmns.umd.edu/undergraduate](http://cmns.umd.edu/undergraduate) academic-support-tutoring
- Online list of tutoring and academic support resources. A few resources are listed below:

  **Math Success Program**
  [reslife.umd.edu/mathsuccess](http://reslife.umd.edu/mathsuccess)
  Provides free math tutoring.

  **Math Test Bank**
  [www-math.umd.edu/testbank.html](http://www-math.umd.edu/testbank.html)
  Database of old math exams.

  **The Writing Center**
  [english.umd.edu/academics/writingcenter](http://english.umd.edu/academics/writingcenter)
  Consultants help students improve written assignments for any class.

  **Disability Support Services**
  [counseling.umd.edu](http://counseling.umd.edu)
  (Click on the “Accessibility & Disability Service” tab)
  301.314.7682
  Coordinates accommodations for students with disabilities. Students must contact DSS to determine eligibility for services.

  **Education Abroad**
  [globalmaryland.umd.edu/offices/education-abroad](http://globalmaryland.umd.edu/offices/education-abroad)
  Coordinates studying abroad.

  **Office of Multi-Ethnic Student Education**
  [omse.umd.edu](http://omse.umd.edu)
  Provides academic, personal, and professional support to multi-ethnic students.

  **University Career Center**
  [careers.umd.edu](http://careers.umd.edu)
  Helps students plan career goals. Assists with job/internship searches, creating resumes, interview skills, finding a part-time job on campus, and more.

  **The Reed-Yorke Health Professions Advising Office**
  [prehealth.umd.edu](http://prehealth.umd.edu)
  Provides advising and other resources to pre-health profession students (pre-med, pre-dental, and all allied health). Be sure to sign up for their listserv and follow their social media accounts for the most up-to-date information and opportunities.

  **University Health Center**
  [health.umd.edu](http://health.umd.edu)
  301.314.8180
  Offers clinical and mental health services. A pharmacy is located in their building.

  **Counseling Center**
  [counseling.umd.edu](http://counseling.umd.edu)
  301.314.7651
  The Counseling Center and the University Health Center provide free confidential services by professional counselors.

  **LGBT Equity Center**
  [umd.edu/lgbt](http://umd.edu/lgbt)
  Provides information and support services regarding sexual orientation and gender identity.

  **Office of Student Financial Aid**
  [financialaid.umd.edu](http://financialaid.umd.edu)
  Provides information on loans, payment plans, grants, scholarships, and the Federal Work-Study program. Financial aid counselors are available.

  **Scholarships**
  [cmns.umd.edu/undergraduate/scholarships](http://cmns.umd.edu/undergraduate/scholarships)
  Information about campus, college, CMNS departmental, and off-campus scholarships.

  **Office of Information Technology**
  [it.umd.edu](http://it.umd.edu)
  301.405.1500
  Provides assistance when you have problems with IT resources. Free software downloads at terpware.umd.edu

  **Office of the Registrar**
  [rr.umd.edu](http://rr.umd.edu)
  301.314.8240
  Oversees student records. Has information on class schedules, academic deadlines, and the Undergraduate Catalog. Testudo and Venus are accessible through the website.

  **Department of Resident Life**
  [reslife.umd.edu](http://reslife.umd.edu)
  Has information about on- and off-campus housing.

  **Student Organizations**
  [orgsync.umd.edu](http://orgsync.umd.edu)
  Information on student organizations.

  **Leadership and Community Service Learning**
  [thestamp.umd.edu/leadership_community_service-learning](http://thestamp.umd.edu/leadership_community_service-learning)
  Provides academic programs and resources for leadership and service-learning. Has a database of community service opportunities.