Comprehensive major in

BIOCHEMISTRY/MOLECULAR BIOLOGY

UNIVERSITY OF WISCONSIN-EAU CLAIRE UNDERGRADUATE FACT SHEET

Biochemistry/molecular biology (B/MB) involves the study of life processes at the molecular level. Students study how molecules such as DNA, RNA, and proteins control our heredity, development, aging and mental activity, and how abnormalities in these molecules can lead to diseases such as cancer, heart disease, AIDS, etc.

WHY STUDY MOLECULAR BIOLOGY & BIOCHEMISTRY?

- Molecular biologists and biochemists frequently play a pivotal role in dealing with various challenges that face society.
- The major leads to entry-level employment opportunities in research and development in industrial and government laboratories, medical research clinics, and the biotechnology industry.
- You will be well prepared to enter graduate studies in cell and molecular biology, genetics, microbiology, biochemistry, and related fields.
- The B/MB major is an excellent foundation for pre-professional students planning to attend medical, dental, veterinary, or optometry schools.
- In addition to knowledge of your subject and practical technical skills, you will strengthen your ability to solve problems, analyze data and communicate new information, and gain a greater understanding of statistics and computing.
- You can apply your molecular/biochemical knowledge to life-changing endeavors, such as producing vaccines and novel drugs and improving crops and livestock through genetic engineering.

THE EAU CLAIRE ADVANTAGE

- UW-Eau Claire has an excellent reputation of producing well-trained graduates.
- Internships provide students the opportunity to gain real world experience at university research laboratories, biotechnology firms and clinical laboratories.
- The UW-Eau Claire Molecular Movement Club provides students with leadership opportunities, job search assistance, and information about professional schools.
- Students participate in weekly seminars featuring presentations by top researchers.
- Through our student/faculty collaborative research program, students participate in fascinating research projects while working one-on-one with a professor in his/her field and gaining in-depth knowledge for future careers or graduate school.
- Class sizes are small, and professors are able to give students individual attention.
- Unlike many other public universities, classes are not taught by teaching assistants. Students work alongside interesting professors who inspire learning.

UW-EAU CLAIRE FACTS AT A GLANCE

- Location: Eau Claire, WI.; city pop. 65,000, pop. of metro area 151,000
- Average enrollment: 10,500
- Undergraduates: 10,000
- Graduate students: 500
- International students: 262
- Multicultural students: 847
- Men to women ratio: 7-to-10
- Students doing undergraduate research with faculty/staff: 800+
- ACT composite average: 24+
- Average high school rank: 75%
- Average class size: 28
- Faculty-student ratio: 1-to-22
- Student organizations: 250+
- In-state tuition/fees, room and board (two semesters): $14,991
- Walk across campus: About 10 minutes
- Nickname: Blugolds
- Colors: Navy and Old Gold

- Fully equipped laboratories are available for teaching and research in genetics, developmental biology, recombinant DNA techniques, plant and animal physiology, microbiology, biochemistry, organic chemistry and physical chemistry.
- Laboratories are well-equipped with up-to-date instruments not often found in undergraduate laboratories, including a DNA synthesizer and sequencer, a gas chromatograph/mass spectrometer, a 3-D molecular graphics workstation, a superconducting nuclear magnetic resonance spectrometer, a Fourier transform infrared spectrometer, and transmission and scanning electron microscopes.
- Through laboratory-based education, students receive hands-on experience in problem solving and in modern techniques, experimental design, and data analysis.
CAREER OPTIONS

- Diagnose and treat human diseases and develop new therapeutic agents in medical or pharmaceutical fields.
- Conduct research in a biotechnology firm, pharmaceutical company, university, government agency, foundation laboratory, hospital or clinic. Recent data from Mayo Clinic indicate that 10-15% of their employees in laboratory medicine are our B/MB majors.
- Work in sales and purchasing or marketing research for a biotech or scientific manufacturing company.
- Obtain a M.S. and/or Ph.D. degree to be eligible for research/teaching positions at universities, foundations and clinics.

*Students interested in a B/MB major should complete 4 years coursework in high school mathematics. Students who have not had sufficient HS math may be required to complete appropriate coursework prior to starting biology and chemistry courses at UWEC. Entry level college math course is determined by score on mathematics placement test taken prior to summer orientation.

REQUIRED COURSEWORK IN BIOCHEMISTRY/MOLECULAR BIOLOGY COMPREHENSIVE MAJOR, a minimum of 81 credits:
The Departments of Biology and Chemistry at UW-Eau Claire offer this multidisciplinary comprehensive major in partnership. Required courses are as follows:

**Core courses:**
- Chem 115 Chemical Principles (or Chem 103 & 104)
- Biol 221 Foundations of Biology I
- Biol 222 Foundations of Biology II
- Biol 223 Foundations of Biological Inquiry
- Biol 300 Genetics
- Chem 213 Quantitative Analysis
- Chem 325 & 326 Organic Chem I & II
- Math 114 Calculus I
- Physics 211 & 212 General Physics

**Advanced courses:**
- Biol 302 Cell Biology
- Biol 304 Molecular Biology
- Biol 401 Recombinant DNA Tech.
- Biol 409 Molecular Genetics
- Chem 406 Biophysical Chemistry
- Chem 452 Biochemistry I
- Chem 453 Biochemistry Lab I
- Chem 454 Biochemistry II
- Chem 455 Biochemistry Lab II
- Biol/Chem 412 B/MB Seminar

Additionally, it is strongly recommended that students participate in faculty/student research collaboration with a molecular biology or biochemistry faculty member.

HIGH SCHOOL PREPARATION

- Successful completion of high school courses in English, algebra, geometry, physics, chemistry and biology are especially important for students interested in molecular biology and biochemistry.
- All students who enroll at UW-Eau Claire are required to have a minimum of 17 college preparatory units including:
  - 4 years of English (at least 3 composition and literature)
  - 2 years of a foreign language
  - 3 years of math* (algebra, geometry, 1 advanced college preparatory math)
  - 3 years of natural science
  - 3 years of social science (1 must be world or American history)
  - 2 additional units of course work

FRESHMAN COURSE WORK

Sample First-Year Program:

**FALL SEMESTER**

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<thead>
<tr>
<th>COURSE #</th>
<th>CREDITS</th>
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<tbody>
<tr>
<td>Biol 221 – Foundations I</td>
<td>4</td>
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<tr>
<td>(Math 109 is a pre–req; Chemistry is a co-requisite)</td>
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<tr>
<td>Chem 115 - Chem. Principles</td>
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<td>Math 114* – Calculus I</td>
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<td>General education course</td>
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**SPRING SEMESTER**

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<td>Biol 222 – Foundations II</td>
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<tr>
<td>Biol 223 – Foundations of Inquiry</td>
<td>2</td>
</tr>
<tr>
<td>Chem 213 – Quant. Analysis</td>
<td>4</td>
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<tr>
<td>Writing 114 - College Writing</td>
<td>5</td>
</tr>
<tr>
<td>General education course</td>
<td>3</td>
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FOR MORE INFORMATION:

Department of Biology
Phillips Hall 330
UW-Eau Claire
Eau Claire, WI 54701
(715) 836-4166

Department of Chemistry
Phillips Hall 430
UW-Eau Claire, WI 54701
(715) 836-3417

Check out our web sites at
www.uwec.edu/biology
www.uwec.edu/chemistry

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