MOLECULAR BIOLOGY MAJOR
(B.S.)

The main objectives of our undergraduate Molecular Biology major are: to educate students in greater depth in molecular studies than would be possible in our Biology program, and to prepare students in the methodological advances which have changed the study of biology in recent years. The field of molecular biology has an impact on almost every other area of study in the biological sciences, and its development has led to expanded graduate and professional programs. The Molecular Biology curriculum will provide undergraduate students with a fundamental knowledge of the principles and practices inherent in the rapidly advancing field of molecular biology.

Students who major in Molecular Biology can also enter the burgeoning biotechnology industry, well prepared to compete in the modern scientific marketplace, as most institutions carry on basic or applied research in biomedical areas today using techniques of molecular biology. Students completing this major will be well-prepared to enter professional schools of medicine, dentistry, veterinary medicine, and optometry, as well as graduate programs.

A minimum of 120 credits of coursework is required for the baccalaureate degree with a minimum 2.0 overall GPA, and a minimum 2.0 major GPA. However, more than 120 credits may be required depending upon the major field of study.

Program Requirements
Students must complete 42 credits of General Education requirements (http://catalog.montclair.edu/undergraduate-graduate-degree-requirements/general-ed-ba-bs) and 3-9 credits of World Languages and Cultures Requirements (http://catalog.montclair.edu/undergraduate-graduate-degree-requirements/world-languages-cultures-requirement).

Required Courses
- BIOL 112 Principles of Biology I 4
- BIOL 113 Principles of Biology II 4
- BIOL 230 Cell and Molecular Biology 4
- BIOL 350 Microbiology 4
- BIOL 380 Genetics 4
- BIOL 434 Molecular Biology 3
- BIOL 435 Experimental Molecular Biology 3

Research Requirement
- BIOL 409 Externship in Biological Research (Co-operative Education) 4
  or BIOL 418 Biology Independent Research

Elective Courses
Select 8 credits from the list (see below) 8

Chemistry Collateral
- CHEM 120 General Chemistry I 4
- CHEM 121 General Chemistry II 4
- CHEM 230 Organic Chemistry I 3
- CHEM 231 Organic Chemistry II 3
- CHEM 232 Experimental Organic Chemistry I 2
- CHEM 370 Biochemistry I 3
- CHEM 371 Biochemistry II 3

Physics Collateral
Select one of the following sequences: 8

<table>
<thead>
<tr>
<th>Course(s)</th>
<th>Description</th>
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<tbody>
<tr>
<td>PHYS 191</td>
<td>University Physics I</td>
</tr>
<tr>
<td>PHYS 192</td>
<td>University Physics II</td>
</tr>
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Math Collateral
Select one of the following sequences: 8

<table>
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<th>Description</th>
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<tbody>
<tr>
<td>MATH 110</td>
<td>Statistics for the Biological Sciences</td>
</tr>
<tr>
<td>MATH 116</td>
<td>and Calculus A</td>
</tr>
<tr>
<td>MATH 122</td>
<td>Calculus I</td>
</tr>
<tr>
<td>MATH 221</td>
<td>and Calculus II</td>
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Computer Science Collaterals
Select one of the following sequences: 3

<table>
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<tr>
<th>Course(s)</th>
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<tbody>
<tr>
<td>CSIT 100</td>
<td>Introduction to Computer Concepts</td>
</tr>
<tr>
<td>or CSIT 111</td>
<td>Fundamentals of Programming I</td>
</tr>
</tbody>
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Total Credits: 79

Elective Courses
- BIOL 360 Introduction to Bio-Imaging 3
- BIOL 405 Cell Culture 3
- BIOL 406 Scanning Electron Microscopy 4
- BIOL 410 Toxicology 3
- BIOL 411 Introduction to Transmission Electron Microscopy 4
- BIOL 415 Population Genetics 3
- BIOL 425 Elementary Plant Physiology 3
- BIOL 433 Developmental Biology 4
- BIOL 442 Human Physiology 4
- BIOL 443 Vertebrate Embryology 4
- BIOL 444 Cell Physiology 3
- BIOL 445 Immunology 3
- BIOL 446 Endocrinology 3
- BIOL 447 Fundamentals of Pharmacology 3
- BIOL 450 Medical Microbiology 3
- BIOL 451 Comparative Animal Physiology 3
- BIOL 457 Virology 3
- BIOL 458 Microbial Genetics 3
- BIOL 468 Neurobiology 3
- BIOL 471 Biomedical Ethics 2
- BIOL 475 Medical Genetics 3
- BIOL 476 Biology of Cancer 3
- BIOL 482 Research Community I: Molecular Biology 4
- BIOL 483 Research Community II: Molecular Biology 4
- BIOL 487 Statistical Genomics 3
- BIOL 488 Selected Topics in Cell and Molecular Biology 3-4
- BIOL 491 Research in Biology Literature 1
- BIOL 492 Senior Colloquium 1
- BIOL 493 Molecular Ecology 3
- BIOL 497 Genomics 3