**CELLULAR AND MOLECULAR BIOLOGY, M.S.**

**REQUIREMENTS**

**MINIMUM GRADUATE SCHOOL REQUIREMENTS**

Review the Graduate School minimum academic progress and degree requirements (http://guide.wisc.edu/graduate/#policiesandrequirementstext), in addition to the program requirements listed below.

**MAJOR REQUIREMENTS**

**MODE OF INSTRUCTION**

<table>
<thead>
<tr>
<th>Face to Face</th>
<th>Evening/Weekend</th>
<th>Online</th>
<th>Hybrid</th>
<th>Accelerated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

**Mode of Instruction Definitions**

**Accelerated:** Accelerated programs are offered at a fast pace that condenses the time to completion. Students typically take enough credits aimed at completing the program in a year or two.

**Evening/Weekend:** Courses meet on the UW–Madison campus only in evenings and/or on weekends to accommodate typical business schedules. Students have the advantages of face-to-face courses with the flexibility to keep work and other life commitments.

**Face-to-Face:** Courses typically meet during weekdays on the UW-Madison Campus.

**Hybrid:** These programs combine face-to-face and online learning formats. Contact the program for more specific information.

**Online:** These programs are offered 100% online. Some programs may require an on-campus orientation or residency experience, but the courses will be facilitated in an online format.

**CURRICULAR REQUIREMENTS**

**Requirement Detail**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Credit</td>
<td>30 credits</td>
</tr>
<tr>
<td>Minimum Residence Credit</td>
<td>16 credits</td>
</tr>
<tr>
<td>Minimum Graduate Coursework</td>
<td>15 credits must be graduate-level coursework. Details can be found in the Graduate School’s Minimum Graduate Coursework (50%) policy (<a href="https://policy.wisc.edu/library/UW-1244">https://policy.wisc.edu/library/UW-1244</a>).</td>
</tr>
<tr>
<td>Overall Graduate</td>
<td>3.00 GPA required.</td>
</tr>
</tbody>
</table>

This program follows the Graduate School’s GPA Requirement policy.

**GPA Requirements**

GPA (https://policy.wisc.edu/library/UW-1203 (https://policy.wisc.edu/library/UW-1203/)).

**Other Grade Requirements**

n/a

**Assessments and Examinations**

See PhD requirements.

**Language Requirements**

No language requirements.

**REQUIRED COURSES**

Eleven credits of coursework, not including 990 research credits, are required to complete the CMB course requirements. One course must be taken from the “core” list of molecular biology courses and one course must be taken from the "core" list of cell biology courses. The remaining credits can come from either the "core" or "elective" list of classes to bring the total number of credits to ten. In addition, one credit must be fulfilled through the required ethics course. All CMB course requirements must be completed by the end of the student’s second year, before completing the preliminary exam and obtaining dissertator status.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Molecular Biology Core</strong></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Choose one of the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOCHEM/GENETICS/MD GENET 620</td>
<td>Eukaryotic Molecular Biology</td>
<td></td>
</tr>
<tr>
<td>BIOCHEM/GENETICS/MICROBIO 612</td>
<td>Prokaryotic Molecular Biology</td>
<td></td>
</tr>
<tr>
<td>ONCOLOGY/PL PATH 640</td>
<td>General Virology-Multiplication of Viruses</td>
<td></td>
</tr>
<tr>
<td><strong>Cell Biology Core</strong></td>
<td></td>
<td>2-3</td>
</tr>
<tr>
<td>Choose one of the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BOTANY 860</td>
<td>Plant Cell Biology</td>
<td></td>
</tr>
<tr>
<td>ZOOLOGY/NEURODPT/NTP 765</td>
<td>Developmental Neuroscience</td>
<td></td>
</tr>
<tr>
<td>PATH 750</td>
<td>Cellular and Molecular Biology/Pathology</td>
<td></td>
</tr>
<tr>
<td>ONCOLOGY 703</td>
<td>Carcinogenesis and Tumor Cell Biology</td>
<td></td>
</tr>
<tr>
<td>GENETICS/CRB 710</td>
<td>Developmental Genetics</td>
<td></td>
</tr>
<tr>
<td>GENETICS/BOTANY/M M &amp; I/PL PATH 655</td>
<td>Biology and Genetics of Fungi</td>
<td></td>
</tr>
<tr>
<td><strong>Ethics Core</strong></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>BIOCHEM 729</td>
<td>Advanced Topics</td>
<td></td>
</tr>
<tr>
<td>ONCOLOGY 715</td>
<td>Ethics in Science</td>
<td></td>
</tr>
<tr>
<td>SURG SCI 812</td>
<td>Research Ethics and Career Development</td>
<td></td>
</tr>
</tbody>
</table>

Remaining credits can come from either the core or elective list of classes to bring the total number of credits to eleven.

**Elective Courses** | 4-5 |
B M E 510  Introduction to Tissue Engineering
B M E 520  Stem Cell Bioengineering
B M E/CBE 783  Design of Biological Molecules
B M E/CRB  670  Biology of Heart Disease and Regeneration
B M E 545  Engineering Extracellular Matrices
B M E 556  Systems Biology: Mammalian Signaling Networks
B M I/ COMP SCI 576  Introduction to Bioinformatics
B M I/STAT 541  Introduction to Biostatistics
B M I/STAT 877  Statistical Methods for Molecular Biology
B M I 826  Special Topics in Biostatistics and Biomedical Informatics
BIOCHEM/B M I/ BMOLCHEM/ MATH 609  Mathematical Methods for Systems Biology
BOTANY/ BIOCHEM/ GENETICS 840  Regulatory Mechanisms in Plant Development
BIOCHEM/ BOTANY 621  Plant Biochemistry
BIOCHEM/ CHEM 665  Biophysical Chemistry
BIOCHEM/ NUTR SCI 619  Advanced Nutrition: Intermediary Metabolism of Macronutrients
BIOCHEM/ PHMCOL-M/ ZOOLOGY 630  Cellular Signal Transduction Mechanisms
BIOCHEM 570  Computational Modeling of Biological Systems
BIOCHEM 601  Protein and Enzyme Structure and Function
BMOLCHEM 675  Advanced or Special Topics in Biomolecular Chemistry
BOTANY/ ENTOM/ PL PATH  505  Plant-Microbe Interactions: Molecular and Ecological Aspects
BOTANY/ PL PATH 563  Phylogenetic Analysis of Molecular Data
CRB/ MEDICINE  701  Cell Signaling and Human Disease
CRB 640  Fundamentals of Stem Cell and Regenerative Biology
CRB 650  Molecular and Cellular Organogenesis
F&W ECOL/ HORT/ STAT 571  Statistical Methods for Bioscience I
GENETICS/ HORT  550  Molecular Approaches for Potential Crop Improvement
GENETICS/ MD GENET  677  Advanced Topics in Genetics
GENETICS/ BIOCHEM 631  Plant Genetics and Development
GENETICS 633  Population Genetics

GENETICS 885  Advanced Genomic and Proteomic Analysis
M M & I/PATH-BIO 528  Immunology
M M & I 740  Mechanisms of Microbial Pathogenesis
MICROBIO 657  Bioinformatics for Microbiologists
NEURODPT/NTP/ PSYCH  611  Systems Neuroscience
NTP 670  Stem Cells and the Central Nervous System
M M & I/PATH-BIO 750  Host-Parasite Relationships in Vertebrate Viral Disease
MED PHYS 671  Selected Topics in Medical Physics
MICROBIO/ BMOLCHEM 668  Microbiology at Atomic Resolution
MICROBIO 607  Advanced Microbial Genetics
ONCOLOGY 675  Advanced or Special Topics in Cancer Research
ONCOLOGY 778  Bioinformatics for Biologists
OPHTHALM 750  Ocular Diseases of the Mammalian Vision System
PATH 751  Biology of Aging
PATH 803  Pathogenesis of Major Human Diseases
PATH 807  Immunopathology: The Immune System in Health and Disease
PATH-BIO 675  Special Topics
ZOOLOGY 604  Computer-based Gene and Disease/Disorder Research Lab

Research Credits
A minimum of 51 credits taken in graduate level courses are required: the 11 above, and the remaining credits can be 990 research credits.

Total Credits 51-53

1

EXCEPTION: M.D./Ph.D. students are only required to take 3 credits from the Core Curriculum or the Elective Courses list.

2

EXCEPTION: M.D./Ph.D. students are not required to take an ethics course because they received this training in their M.D. courses.