

# APPLIED BIOCHEMISTRY AND CELL BIOLOGY (MS)

The Master of Science in Applied Biochemistry and Cell Biology is a professional master's degree intended to provide students with a comprehensive education in Biochemistry and Cell Biology. By combining coursework, internships and advanced laboratory training, this program prepares students for employment in the biotechnology, pharmaceutical, diagnostic, government, and academic sectors.

## Requirements

A minimum total of 33 credits, an internship and passing an exit examination. Students are required to take 18 credits of core conceptual courses, eight credits of Practical Coursework Options (including workshops, laboratory or research courses), and seven credits of professional master's cohort courses (communication skills, Frontiers seminars, business practices, internship). In special circumstances the Advisory Committee may waive some of these requirements.

| Course   | Title   | Credits |
|--|---|---------|
| <b>Conceptual Courses</b>  |   |         |
| Select 18 credits from the following:  |   | 18      |
| MCB 3211   | Cancer Cell Biology and Genetics                    |         |
| MCB 3219   | Developmental and Regenerative Biology              |         |
| MCB 4026W  | Advanced Biochemistry Laboratory                    |         |
| MCB 4211   | Basic Immunology                                    |         |
| MCB 5003   | Biophysical Chemistry I                             |         |
| MCB 5008   | Techniques of Biophysical Chemistry                 |         |
| MCB 5012   | Foundations of Structural Biochemistry              |         |
| MCB 5013   | Structure and Function of Biological Macromolecules |         |
| MCB 5014   | Structure and Dynamics of Macromolecular Machines   |         |
| MCB 5200   | Cell Biology of the Mammalian Secretory Apparatus   |         |
| MCB 5217   | Biosynthesis of Nucleic Acids and Proteins          |         |
| MCB 5240   | Virology  |         |
| MCB 5250   | Techniques in Cellular Analysis                     |         |
| MCB 5255   | Cellular and Molecular Immunology                   |         |
| MCB 5280   | Advanced Cell Biology                               |         |
| MCB 5284   | Current Topics in Cell and Developmental Biology    |         |
| MCB 5454   |   |         |
| MCB 5471   |   |         |
| PHRX 3001  | Immunology  |         |
| PHAR 5471  | Advanced Pharmacology I: Basic Principles           |         |
| PHAR 5472  | Advanced Pharmacology II: Drug Disposition          |         |
| PHAR 6455  | Advanced Toxicology                                 |         |
| PNB 3260   | Stem Cell Biology                                   |         |
| Another course with prior approval from the Applied Biochemistry and Cell Biology Program Director |   |         |

### Practical Coursework Options

Select eight credits from the following: 8

|  |   |              |
|--|---|--------------|
| MCB 5427   | Laboratory Techniques in Functional Genomics                          |              |
| MCB 5430   | Analysis of Eukaryotic Functional Genomic Data                        |              |
| MCB 5670   | Theory and Practice of Laboratory Techniques in Microbiology          |              |
| MCB 5671   | Advanced Theory and Practice of Laboratory Techniques in Microbiology |              |
| MCB 5672   | Applied Bioinformatics  |              |
| MCB 6897   | Research  |              |
| MCB 5895   | Special Topics in Molecular and Cell Biology <sup>1</sup>             |              |
| Another course with prior approval from Applied Biochemistry and Cell Biology program director |   |              |
| <b>Professional Master's Cohort Courses</b>  |   |              |
| A minimum of seven credits required <sup>2</sup>   |   |              |
| MCB 5490   | Industrial Insights   | 1-2          |
| MCB 5491   | Professional Development Seminar (two credits)                        | 2            |
| MCB 5900   | Professional Writing and Communication Skills                         | 1            |
| Internship <sup>3</sup>  |   | 3            |
| <b>Total Credits</b>   |   | <b>33-34</b> |

<sup>1</sup> When taught as: Introduction to Flow Cytometry, Introduction to Microscopy, Practical Applications of Cell Culture, Multimode Plate Reader, Protein Purification, Molecular Graphics, Ligand Binding.

<sup>2</sup> Other possible classes include MCB 5910 Responsible Conduct in Research; MCB 5080 Frontiers in Microbiology; or another course with prior approval from Applied Biochemistry and Cell Biology program director.

<sup>3</sup> e.g. GRAD 5930 Full-Time Directed Studies (Master's Level)

Note: Only six credits total of 3000 and 4000 level courses may be applied to the graduate degree.