# PROFESSIONAL SCIENCE MASTER'S IN NATURAL SCIENCES, BIOLOGICAL DATA ANALYTICS SPECIALIZATION

## Requirements
## Effective Fall 2021

Because this program is intended to serve students with a wide range of backgrounds, each student must work with an advisor to determine an appropriate selection of courses.

| First Year | | Credits |
|---|---|---|
| BUS 500 | Foundations for Business Impact | 2 |
| DSCI 510 | Linux as a Computational Platform | 1 |
| DSCI 511 | Genomics Data Analysis in Python | 2 |
| NSCI 693C | Graduate Seminar: Biological Data Analytics | 1 |
| Select one course from the following: | | 1-3 |
| BC 601 | Responsible Conduct in Biochemistry | |
| BUS 505 | Legal and Ethical Environment of Business | |
| CM 666/PHIL 666 | Science and Ethics | |
| GRAD 544 | Ethical Conduct of Research | |
| NSCI 575/GRAD 575 | Ethical Issues in Big Data Research | |
| Select one course from the following: | | 3-4 |
| ERHS 535 | R Programming for Research | |
| STAR 511 | Design and Data Analysis for Researchers I | |
| Select a minimum of 3 credits from the following: | | 3-4 |
| BC 563[1] | Molecular Genetics | |
| CM 505 | Nucleic Acids for Non-Life Scientists | |
| CM 506 | Protein Basics for NonBiologists | |
| MIP 543 | RNA Biology | |
| | **Total Credits** | **13-17** |
| **Second Year** | | |
| DSCI 512 | RNA-Sequencing Data Analysis | 1 |
| MGT 340 | Fundamentals of Entrepreneurship | 3 |
| NSCI 693C | Graduate Seminar: Biological Data Analytics | 1 |
| NSCI 696F | Group Study: Biological Data Analytics Project Proposal | 6 |
| Select one course from the following: | | 3-4 |
| BC 563[1] | Molecular Genetics | |
| MIP 543 | RNA Biology | |
| Select one course from the following: | | 3-4 |
| ERHS 544/STAT 544 | Biostatistical Methods for Quantitative Data | |
| STAR 512 | Design and Data Analysis for Researchers II | |
| Electives (select from the list below with approval of advisor)[2] | | 4-10 |
| | **Total Credits** | **21-29** |
| | **Program Total Credits:** | **40** |

A minimum of 40 credits are required to complete this program.

## Electives

| Code | Title | Credits |
|---|---|---|
| **Math/Computational Electives:** | | |
| BC 571 | Quantitative Biochemistry | |
| CS 548/STAT 548 | | |
| DSCI 475 | Topological Data Analysis | |
| MATH 532 | Mathematical Modeling of Large Data Sets | |
| **Statistics Electives:** | | |
| ERHS 534 | SAS and Epidemiologic Data Management | |
| HORT 579 | Mass Spectrometry Omics-Methods and Analysis | |
| STAR 511 | Design and Data Analysis for Researchers I | |
| **Science Electives:** | | |
| BC 512 | Principles of Macromolecular Structure | |
| BC 565 | Molecular Regulation of Cell Function | |
| BC 663 | Gene Expression | |
| MIP 543 | RNA Biology | |
| MIP 565/BZ 565 | Next Generation Sequencing Platform/ Libraries | |
| MIP 570 | Functional Genomics | |
| MIP 576/ BSPM 576 | Bioinformatics | |
| **Business Electives:** | | |
| MGT 430 | Leadership and Social Responsibility | |
| MGT 450 | | |
| **Communications Electives:** | | |
| GRAD 550 | STEM Communication | |

[1] BC 563 is generally required in either the first or second year, but may be waived if the student has sufficient prior coursework.

[2] Select enough elective credits to bring the program total to a minimum of 40 credits. Students are required to take elective courses from at least 2 of the 5 categories. Electives may be taken in the first or second year with the approval of advisor.