BSc Honours Molecular Biology and Biotechnology

Minimum Requirements for Graduation: GPA Cumulative Average 60% and Major Average 70%

RECOMMENDED COURSE SEQUENCE

Fall Semester:	Winter Semester:
Year 1: Ten Courses Including: ❑ **BIOL 1101** – Cell Biology ❑ **CHEM 1100** – General Chemistry I ❑ **COMP 1047 –** Comp. Concepts End-Users or **COMP-2067** Programming for Beginners ❑ **MATH 1720** or **MATH 1760** – Differential Calculus ❑ **PHYS 1300 –** Intro Physics Life Sciences **I** or **PHYS 1400** – Intro Physics I	❑ **BIOL 1111** – Biological Diversity ❑ **CHEM 1110** – General Chemistry II ❑ **PHYS 1310 –** Intro Physics Life Sciences II or **PHYS 1410** – Intro Physics II ❑ **STAT 2910 –** Statistics for the Sciences ❑ _____ Any Area of Study Course
Year 2: Ten Courses Including: ❑ **BIOL 2071 –** Intro Microbiology & Techniques ❑ **BIOL 2101 –** Ecology ❑ **BIOL 2111** – Genetics ❑ **CHEM 2300 –** Intro Organic Chemistry I ❑ _____ Any Area of Study Course	❑ **BIOC 2010** – Organic Chem. of Biomolecules ❑ **BIOM 2131 –** Introductory Molecular Biology ❑ _____ Mol Bio&Biotech* or Biochem/Chem/Bio Option** ❑ _____ Mol Bio&Biotech* or Biochem/Chem/Bio Option** ❑ _____ Any Area of Study Course
Year 3: Ten Courses Including: ❑ **BIOC 3100 –** Metabolism I ❑ **BIOM 3500 –** Molecular Cell Biology ❑ **BIOM 3581† –** Biotech Lab (A - Semester 1) ❑ _____ Mol Bio&Biotech* or Biochem/Chem/Bio Option** ❑ _____ Any Area of Study Course	❑ **BIOC 3110** – Metabolism II ❑ **BIOC 3130 –** Protein and Nucleic Acid Chemistry ❑ **BIOL 3142** – Evolution ❑ **BIOM 3530 –** Advanced Cell Biology ❑ **BIOM 3581† –** Biotech Lab (B - Semester 2)
Year 4: Ten Courses Including: ❑ **BIOL 4570** – Plant Molecular Biology & Physiology ❑ **BIOL 4904**† (Semester 1) – Undergrad Research Biology ❑ _____ Mol Bio&Biotech* or Biochem/Chem/Bio Option** ❑ _____ Mol Bio&Biotech* or Biochem/Chem/Bio Option** ❑ _____ Mol Bio&Biotech* or Biochem/Chem/Bio Option**	❑ **BIOC 4010** – Bioinformatics/Genomics/Proteomics ❑ **BIOM 4560** – Molecular Biotechnology ❑ **BIOL 4904**† **(**Semester 2) – Undergrad Research Biology ❑ _____ Mol Bio&Biotech* or Biochem/Chem/Bio Option** ❑ _____ Mol Bio&Biotech* or Biochem/Chem/Bio Option**

*Must choose **5** courses from the following **Mol Bio & Biotech Options**:

❑ **BIOL 3022**	❑ **BIOM 3070**	❑ **BIOM 3550**	❑ **BIOM 4540**
❑ **BIOL 3571**	❑ **BIOM 3071**	❑ **BIOM 4530**	❑ **BIOM 4590**

Must Choose **3 courses from the following **Biochem/Chem/Bio Options**:

❑ **BIOC 4030**	❑ **BIOL 2480**	❑ **BIOL 4481**	❑ **CHEM 2500**
❑ **BIOC 4050**	❑ **BIOL 4232**	❑ **BIOM 4440**	❑ **CHEM 3210**
❑ **BIOL 4008**	❑ **BIOL 4450**	❑ **CHEM 2200**	

†Delivered over two semesters and counts for two courses (6 credits). BIOL 4904 also requires a 70% major GPA, and 60% cumulative GPA.

Please note: Maximum of 14 courses at 1000 level can be used towards the degree requirement. Students considering application to some Pharmacy schools are advised to take CHEM-2400. Students planning to write the MCAT or DAT may wish to take PSYC-1150 and PSYC-1160 (Social Science) and GART-1500 or ENGL-1001 (Art/Language).

CORE COURSES SUMMARY

CORE COURSES (A) – BIOLOGY & BIOMEDICAL: Total 11 Courses

Complete **ALL** of the following:

- ❑ **BIOL 1101** – Cell Biology
- ❑ **BIOL 1111** – Biological Diversity
- ❑ **BIOL 2071** – Intro Microbiology & Tech.
- ❑ **BIOL 2101 –** Ecology
- ❑ **BIOL 2111** – Genetics
- ❑ **BIOM 2131** – Intro Molecular Biology
- ❑ **BIOL 3142** – Evolution
- ❑ **BIOM 3500 –** Molecular Cell Biology
- ❑ **BIOM 3530 –** Advanced Cell Biology
- ❑ **BIOM 4560** – Molecular Biotechnology
- ❑ **BIOL 4570** – Plant Molecular Biology & Physiology

CORE COURSES (B) – BIOLOGY & BIOMEDICAL: Total 4 Courses

Complete **ALL** of the following pair:

- ❑ **BIOL 4904**† **-** Undergrad Research Biology
- ❑ **BIOM 3581**† **(A & B)** – Biotechnology Laboratory

†Delivered over two semesters and counts for two courses (6 credits). BIOL 4904 also requires a 70% major GPA, and 60% cumulative GPA

CORE COURSES – CHEMISTRY: Total 8 Courses

Complete **8** of the following:

- ❑ **BIOC 2010** – Organic Chem. of Biomolecules
- ❑ **BIOC 3100 –** Metabolism I
- ❑ **BIOC 3110** – Metabolism II
- ❑ **BIOC 3130 –** Protein and Nucleic Acid Chemistry
- ❑ **BIOC 4010** – Bioinformatics/Genomics/Proteomics
- ❑ **CHEM 1100** – General Chemistry I
- ❑ **CHEM 1110** – General Chemistry II
- ❑ **CHEM 2300 –** Intro Organic Chemistry I

PHYSICS PAIR: Total 2 Courses

Complete **1 PAIR** of the following:

- ❑ **PHYS 1300 & 1310** – Intro Physics Life Sciences I & II
- ❑ **PHYS 1400 & 1410** – Intro Physics I & II

COMPUTER SCIENCE COURSE: Total 1 Courses

Complete **1** of the following:

- ❑ **COMP 1047 –** Comp. Concepts End-Users
- ❑ **COMP-2067 –** Programming for Beginners

MATH COURSES: Total 2 Courses

- ❑ **MATH 1720** or **MATH 1760** – Differential Calculus
- ❑ **STAT 2910 –** Statistics for the Sciences

MOLECULAR BIO & BIOTECHNOLOGY COURSES: – Total 5 courses

Complete **5** of the following

- ❑ **BIOL 3022** – Res. Principles/Study Design Biology
- ❑ **BIOL 3571** – Animal Cells and Tissues
- ❑ **BIOM 3070** – Medical Microbiology OR **BIOM 3071** – Medical Micro. And Techniques (cannot take both)
- ❑ **BIOM 3550** – Embryology
- ❑ **BIOM 4530** – Biology of Cell Transformation
- ❑ **BIOM 4540** – Regenerative Biology and Disease
- ❑ **BIOM 4590** – Epigenetics

ADDITIONAL CHEM, BIOCHEM, BIO COURSES: – Total 3 courses

Complete **3** of the following:

- ❑ **BIOC 4030** – Enzymology and Biotechnology
- ❑ **BIOC 4050** – Drug Design
- ❑ **BIOL 4008** – Special Topics
- ❑ **BIOL 2480** – Principles of Neuroscience
- ❑ **BIOL 4232** – Pollution Ecology
- ❑ **BIOL 4450** – Behavioural Neurobiology
- ❑ **BIOL 4481** – Excitable Cells
- ❑ **BIOM 4440** – Neurophysiology
- ❑ **CHEM 2200** – Analytical Chemistry
- ❑ **CHEM 2500** – Intro. Inorganic Chemistry
- ❑ **CHEM 3210** – Princ. of Instrumental Analysis

ADDITIONAL COURSES – Total 4 courses

- ❑ **Any Area of Study –** Choose **4** Courses (Recommend a minimum of one Arts/Language and one Social Science)

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