Biology Level II Info Night
Dr. Pat Chow Fraser
Associate Chair, Undergraduate Studies

March 13, 2019
HSC 1A1
Honours Biology Programs

- Biology Honours Programs
  - Biology (39 electives)
  - Biology + Discovery Subplan (30 electives)
  - Biology & Physiology (21 electives)
  - Molecular Biology & Genetics 24 (electives)

- Combined Honours Programs
  - Biology & Environmental Science (21 electives)
  - Biology & Mathematics (30-33 electives)
  - Biology & PNB (15-18 electives)
  - Neuroscience (15-24 electives)

- With Other Programs
  - Arts & Science & Biology
  - iSci (Biology concentration)
<table>
<thead>
<tr>
<th>Biology &amp; Biology Discovery Subplan</th>
<th>Biology, Physiology</th>
<th>Molecular Biology &amp; Genetics (MBG)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bio2C03</strong> (Genetics)</td>
<td><strong>Bio2C03</strong> (Genetics)</td>
<td>6 units</td>
</tr>
<tr>
<td>Stats2B03 (Statistics)</td>
<td>Stats2B03 (Statistics)</td>
<td>CHEM 2OA3 (Organic I)</td>
</tr>
<tr>
<td><strong>9 units</strong> - Level 2 Bio</td>
<td><strong>12 units</strong></td>
<td>CHEM 2OB3 (Organic II)</td>
</tr>
<tr>
<td>2A03 (Animal Phys)</td>
<td>Bio2A03 (Animal Phys)</td>
<td>3 units - Stats2B03</td>
</tr>
<tr>
<td>2B03 (Cell)</td>
<td>Bio2B03 (Cell)</td>
<td>6 units - Level 2 Bio Courses</td>
</tr>
<tr>
<td>2D03 (Plant Biodiv &amp; Biotech</td>
<td>Bio2C02 (Genetics)</td>
<td>2A03 (Animal Phys)</td>
</tr>
<tr>
<td>2EE3 (Microbiology)</td>
<td>Bio2F03 (Ecology)</td>
<td>2D03 (Plant Biodiv &amp; Biotech)</td>
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<tr>
<td>2F03 (Ecology)</td>
<td></td>
<td>2F03 (Ecology)</td>
</tr>
<tr>
<td><strong>3 units</strong> – Level 2 Chem</td>
<td><strong>6 units</strong></td>
<td>3FF3 (Evolution)</td>
</tr>
<tr>
<td>2EO3, 2OA3, 2OC3, 2OG3</td>
<td>Chem2OA3, Chem2OB3 (Organic)</td>
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<tr>
<td></td>
<td><strong>12 units</strong></td>
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<tr>
<td>Biology Course List</td>
<td><strong>Bio3P03</strong> (Cell Physiology)</td>
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<tr>
<td><strong>15 units</strong></td>
<td><strong>Bio3U03</strong> (An Phys-Homeostasis)</td>
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<tr>
<td>Biology Course List</td>
<td><strong>Bio3UU3</strong> (An Phys-Regulatory Systems)</td>
<td></td>
</tr>
<tr>
<td>18 units</td>
<td><strong>Bio3ZZ3</strong> (Topics in Physiology)</td>
<td></td>
</tr>
<tr>
<td>Level 3- Level 4 Bio &amp; MBG Courses</td>
<td><strong>6 units</strong></td>
<td></td>
</tr>
<tr>
<td>Discovery: additional</td>
<td>Physiology Course List</td>
<td></td>
</tr>
<tr>
<td>9 units - Lab/Field Courses</td>
<td>Must include:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bio3XL3 (Comp Vert Antony/Phys)</td>
<td></td>
</tr>
<tr>
<td>30-39 units - Electives</td>
<td>Bio4T03 (Neurobiology)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bio4X03 (Environmental Physiology)</td>
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<tr>
<td></td>
<td><strong>27 units</strong> - Physiology Course List</td>
<td></td>
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<td></td>
<td><strong>21 units</strong> – Electives</td>
<td></td>
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<tr>
<td></td>
<td><strong>24 units</strong></td>
<td></td>
</tr>
<tr>
<td>Bio4C12 (thesis) or</td>
<td>Optional for Biology</td>
<td></td>
</tr>
<tr>
<td>Bio4F06 (project)</td>
<td>Required for Discovery either</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4F06 or 4C12</td>
<td>Required</td>
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<tr>
<td></td>
<td>**24 units – Electives</td>
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</tbody>
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Biology & Environmental Science (Levels 2 – 4)

For complete program information see undergrad calendar

Level II: 30 Units

9 units
BIOLOGY 2F03 - Fundamental and Applied Ecology
ENVIRSC 2W03 - Physical Hydrology
GEOG 2GI3 – Geographic Information Systems

3 units
BIOLOGY 2C03 - Genetics
LIFESCI 2G03 – Genes, Genomes and Society

3 units
GEOG 3MB3 – Data Analysis
STATS 2B03 - Statistical Methods for Science

3 units
BIOLOGY 2B03 - Cell Biology
BIOLOGY 2D03 - Plant Biodiversity & Biotechnology
BIOLOGY 2EE3 - Intro to Microbiology & Biotech
LIFESCI 2X03 – Environmental Change and Human Health

3 units
ENVIRSC 2B03 - Soils and the Environment
ENVIRSC 2C03 - Surface Climate Processes and Environmental Interactions
ENVIRSC 2E03 - Earth History
ENVIRSC 2Q03 - Intro to Environmental Geochem

6 units
BIOLOGY 3DD3 - Communities and Ecosystems
BIOLOGY 3E13 - Ecological Indicators
BIOLOGY 3ET3 - Ecotoxicology
BIOLOGY 3JJ3 - Field Methods In Ecology
BIOLOGY 3R03 - Field Biology I
BIOLOGY 3SS3 - Population Ecology
ENVIRSC 3B03 - Ecosystems and Global Change

6 units
EARTHSC 3RD3 - Research Design and Dissemination in Earth and Environmental Sciences
EARTHSC 3W03 - Physical Hydrogeology
ENVIRSC 3O03 - Contaminant Fate and Transport
ENVIRSC 3U03 - Environmental Systems Modelling
GEOG 3GI3 - Advanced Raster GIS
GEOG 3SR3 - Remote Sensing

6 units
Course List 1 or 2

6 units
Levels III, IV courses from Course List 2

6 units
Levels III, IV Biology, Mol Bio courses

3 units
ENVIRSC 4EA3 - Environmental Assessment
Biology & Math (Levels 2 – 4)

For complete program information see undergrad calendar

3 units - Bio2C03 (Genetics)

6 units from L2 Bio Courses
Bio2A03 (Animal Phys)
Bio2B03 (Cell)
Bio2D03 (Plant Biodiv & Biotech)
Bio2EE3 (Microbiology)
Bio2F03 (Ecology)

3 units
Bio3FF3 (Evolution)
Bio3S03 (Bioinformatics)
Bio3SS3 (Population Ecology)

9 units
MATH 2X03 (Ad Calculus I)
STATS 2D03 (Intro to Probability)
STATS 2MB3 (Methods & Apps)

6 units
MATH 2C03 (Intro to Diff Equations)
MATH 2R03 (Linear Algebra II)
MATH 2T03 (Intro Numerical Anal)
MATH 2XX3 (Advanced Calculus II)

3 units
MATH 3MB3 (Intro to Modelling)

3 units
MATH 3A03 (Intro to Real Analysis)
MATH 3DC3 (Discrete Dynamical Systems & Chaos)
MATH 3F03 (Ordinary Diff Equations)
MATH 3FF3 (Partial Differential Equations)
MATH 3NA3 (Numerical Linear Algebra)
MATH 3U03 (Combinatorics)
MATH 3V03 (Graph Theory)
MATH 3X03 (Complex Analysis I)
STATS 3A03 (Applied Regression Analysis with SAS)
STATS 3D03 (Mathematical Statistics)
STATS 3U03 (Stochastic Processes)

3 units
COMPSCI 1MD3 (Introduction to Programming)
MATH 1MP3 (Intro to Math Scientific Computation)
PHYSICS 2G03 (Scientific Computing)

9 units - Course List

12 units - Levels 3-4 Math, Stats, Bio, MolBio courses
Required: 1 of BIO 4C09; BIO 4C12; BIO 4F06; MATH 4MB3

30-33 units - Electives
Biology & PNB (Psychology, Neuroscience & Behaviour) [Levels 2 – 4]

For complete program information see undergrad calendar

9 units
BIOLOGY 2C03 - Genetics
CHEM 2OA3 - Organic Chemistry I
CHEM 2OB3 - Organic Chemistry II

18 units
PNB 2XA3 - Human Perception & Cognition
PNB 2XB3 - Neuroanatomy & Neurophys
PNB 2XC3 - Animal Behaviour & Evolution
PNB 2XE3 - Descriptive Statistics
PNB 2XT0 - PNB Tutorial
PNB 3RM3 - Research Methods Lab
PNB 3XE3 - Inferential Statistics

3 units - Level 2 Biology Courses
BIOLOGY 2A03 - Physiology of Animals
BIOLOGY 2B03 - Cell Biology
BIOLOGY 2F03 - Ecology

12 units
Levels III, IV of Biology or Molecular Biology Course List

3 units
Psychology Course List

27 units
Level III or IV courses from the Biology Course List or the Psychology Course List and must include one of:
BIOLOGY 4C09 A/B S
BIOLOGY 4C12 A/B S - Senior Thesis
BIOLOGY 4F06 A/B S - Senior Project
PNB 4D09 A/B - Senior Honours Thesis
PNB 4DD6 A/B - Senior Thesis

15-18 units - Electives
# Neuroscience (Offered by PNB & Biology) [Levels 2 – 4]

For complete program information see undergrad calendar

<table>
<thead>
<tr>
<th>Units</th>
<th>Course Details</th>
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<tbody>
<tr>
<td>0</td>
<td>NEUROSCI 2XN0 - Neuroscience Tutorial</td>
</tr>
<tr>
<td>3</td>
<td>BIOCHEM 2EE3 – Metabol &amp; Phys Chem</td>
</tr>
</tbody>
</table>
| 12    | BIOLOGY 2AO3 – Animal Physiology  
      | BIOLOGY 2B03 – Cell Biology  
      | BIOLOGY 2C03 – Genetics  
      | BIOLOGY 3P03 – Cell Physiology |
| 6     | CHEM 2OA3 - Organic Chemistry I  
      | CHEM 2OB3 - Organic Chemistry II |
| 3     | PHYSICS 2B03 - Electricity  
      | MEDPHYS 2C03 - Electronics for Med & Bio |
| 6     | NEUROSCI 3E03 - Neuroscience Lab  
      | NEUROSCI 4S03 - Neuroscience Seminar |
| 6     | PNB 2XB3 - Neuroanatomy & Neurophysiology  
      | PNB 3XE3 - Inferential Statistics |
| 3     | NEUROSCI 3SN3 - Neural Circuits |
| 6     | Course Lists 1, 2, 3, 4 |
| 3     | Course List 2 |
| 3     | Course List 3 |
| 3     | Course List 4 |
| 15-24 | Electives |

Required: 1 of Bio4F06, PNB 4SC6, NEUROSCI 4L12, NEUROSCI 4L09
Molecular Biology & Genetics Co-op
(18 electives at Level 3 and above)

- Apply in February of Level II for entry into program in Level III
- Criteria for entry
  - Required courses
  - Marks
  - Interview
Making a choice

- Carefully review online calendar & MAP
- Review courses required in 2nd, 3rd and 4th years
- Do you want to take all the required courses?
- Look at the Course List. Do you like all the courses?
- Make a chart comparing your Top 4 choices – The time investment is worth it!
- Program transfers are possible, but…
  - You may need to take additional required courses
  - Space may not be available
You will receive an email from the Registrar’s Office with instructors on how to apply

**Rank 4** programs in order of preference

- If you qualify for your 1st choice, *you will get it*
- If not, but qualify for your 2nd choice, *you will get it*
- If not your 2nd choice, but qualify for your 3rd, *you will get it*
- If not your 3rd choice, but qualify for your 4th, *you will get it*

**Therefore:** Rank your choices in order of preference!
Course Capacities

- All McMaster courses have capacities because of resource limitations
- Register as soon as possible when you receive your summer registration information. You must meet FULL course prerequisites
- Students who have required courses for their programs will be accommodated, but you must register early
- If you don’t get in – keep trying until the drop/add date
Skills Development in Biology Courses
Level 3 & 4 courses: small, better interaction with prof & classmates, course averages > LI & II

- **Critical Thinking Skills**
  - Problem-based learning
  - Inquiry-based learning
  - Writing assignments & tests with written answers

- **Group Work Skills**
  - During labs and field work
  - During PBL and Inquiry Projects

- **Communication Skills**
  - Presentation for PBL & Inquiry projects
  - Writing skills during assignments, tests
Biology Lab, Field and Research-based Courses

- **Lab Courses**
  - Bio 2A03 (Animal Phys)
  - 2D03 (Plant)
  - 2EE3 (Microbio)
  - 2F03 (Ecology)
  - 2L03 (Expt Design in Bio)
  - Bio 3B03 (Plant Physiology)
  - Bio 3E13 (Ecological Indicators)
  - Bio 3MM3 (Invert Form & Func)
  - Bio 3UO3 (Anim physiology-homeostasis)
  - Bio 3VV3 (Lab Methods in Mol Bio)
  - Bio 3XL3 (Comparative Vertebrate Anatomy)
  - Mol Bio 3DD3 (cell bio lab)
  - Mol Bio 3M03 (Development)
  - Mol Bio 3V03 (Techs in MG)

- **Field Courses** (on/off campus)
  - Bio 3JJ3 (Eco Field Methods)
  - Bio 3R03, 3RFO (Field Bio I)
  - Bio 4J03, 4JF0 (Field Bio II)
  - Prereqs: Level I Bio & Stats, and may include Bio2F03
  - ~30 courses/year, various universities

- **Independent Research**
  - Bio 3IR3, Mol Bio 3I03 (3 units)
  - Bio4F06 (6 units), Bio4C12 (12 units) (min grade requirement)

- **Experiential Learning Project**
  - Bio 3EP3, Bio 3IR3, Mol Bio 3I03 (All 3 units)
Finding supervisors for research, inquiry and experiential courses

- Speak to some of the Biology professors tonight about opportunities in their labs
- Also attend the Independent Research Information Session in October 2019 (watch for details next term)
Everyone welcome!!

Biology Undergrad Symposium (BUS)

Wednesday, April 10
MDCL 3019

See 4th year thesis/project student presentations
McMaster Biology Society

Academic club providing Biology students with a multitude of academic, social, fundraising and networking events throughout the year!
McMaster Biology Society

Social & Networking Events

• 1st Year Welcome
• Biology Wine & Cheese
• Biology Research Information Night
• Mock MMI
• Insect & Reptile Biodiversity Night

Contact Us

www.macbiosociety.com
mcmasterbiology@gmail.com
@macbiosociety
Biology Professors (in attendance tonight)

Dr. Bolker
Biology/Math

Dr. Golding
Biology/Math Bioinformatics

Dr. Stone
MBG Bioinformatics

Dr. Chow-Fraser
Bio Enviro Sci Field Ecology

Dr. Kajiura
Biology

Dr. Cameron
MBG Plant Biology

Dr. Weretilnyk
MBG Plant Biology

Dr. Igdoura
MBG Neuroscience

Dr. McClelland
MBG Bio Physiology

Dr. Quinn
Bio Enviro Sci Behavioural Ecology

Dr. Finan
MBG Microbiology

Dr. DaSilva
MBG Physiology

Dr. Kidd
Bio Enviro Sci Ecotoxicology
Join us in the Ewart Angus Hall

- Biology/ Biology Discovery Subplan
- Biology & Physiology
- Biology & Enviro Sci
- Biology & Mathematics
- Molecular Biology & Genetics
- Biology & PNB
- Neuroscience

BRIGHTER WORLD | mcmaster.ca
Need more information on the Biology Program?

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LSB 215
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