Program/Major or Minor/Concentration Revision Form

1.0 Degree Title
Specify the two degrees for concurrent degree programs

1.1 Bachelor of Science

1.2 Concentration (Legacy = Concentration/Option)
If applicable (30 char. max.)

Physiology

1.3 Minor (with Concentration, if applicable)
(30 char. max.)

1.4 Category

Faculty Program (FP)
X Major
Joint Major
Major Concentration (CON)
Minor
Minor Concentration (CON)

Honours (HON)
Joint Honours Component (HC)
Internship/Co-op
Thesis (T)
Non-Thesis (N)
Other
Please specify

1.5 B.Sc.; Major in Physiology

2.0 Administering Faculty/Unit

Faculty of Science

3.0 Effective Term of revision or retirement
Please give reasons in 5.0 "Rationale" in the case of retirement
Ex. Sept. 2004 = 200409
Retirement

Term: 201409

4.0 Existing Credit Weight

65

Proposed Credit Weight

65

5.0 Rationale for revised program

The changes will provide more flexibility through an increase in the number of complementary courses available to enhance competence and satisfy interest in areas useful to the current population of students in a biomedical program.

6.0 Revised Program Description (Maximum 150 words)
### Major in Physiology (65 credits)

**U1 Required Courses (18 credits)**
- Students who have taken CHEM 212 and/or CHEM 222 in CEGEP are exempted and must replace these credits with an elective course(s).

- BIOL 200 Molecular Biology (3 credits)
- BIOL 202 Basic Genetics (3 credits)
- CHEM 222 Introductory Organic Chemistry 2 (4 credits)
- PHGY 209 Mammalian Physiology 1 (3 credits)
- PHGY 210 Mammalian Physiology 2 (3 credits)
- PHGY 212 Introductory Physiology Laboratory 1 (1 credit)
- PHGY 213 Introductory Physiology Laboratory 2 (1 credit)

**U2 and U3 Required Courses (19 credits)**
- BIOC 311 Metabolic Biochemistry (3 credits)
- BIOL 301 Cell and Molecular Laboratory (4 credits)
- PHGY 311 Channels, Synapses & Hormones (3 credits)
- PHGY 312 Respiratory, Renal, & Cardiovascular Physiology (3 credits)
- PHGY 313 Blood, Gastrointestinal, & Immune Systems Physiology (3 credits)
- PHGY 314 Integrative Neuroscience (3 credits)

**Complementary Courses (28 credits)**
- 12-13 credits selected as follows:
  - 3 credits, one of:
    - BIOC 212 Molecular Mechanisms of Cell Function (3 credits)
    - BIOL 201 Cell Biology and Metabolism (3 credits)
  - 3 credits, one of:
    - BIOL 309 Mathematical Models in Biology (3 credits)
    - BIOL 373 Biometry (3 credits)
  - 3 credits, one of:
    - CHEM 203 Survey of Physical Chemistry (3 credits)
    - CHEM 204 Physical Chemistry/Biological Sciences 1 (3 credits)
  - 3-4 credits, one of:
    - ANAT 214 Systemic Human Anatomy (3 credits)
    - ANAT 261 Introduction to Dynamic Histology (4 credits)

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### Proposed program (list courses as follows: Subj Code/Crse Num, Title, Credit weight, under the headings of: Required Courses, Complementary Courses, Elective Courses)

**Major in Physiology (65 credits)**

**U1 Required Courses (18 credits)**
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- BIOC 311 Metabolic Biochemistry (3 credits)
- BIOL 301 Cell and Molecular Laboratory (4 credits)
- PHGY 311 Channels, Synapses & Hormones (3 credits)
- PHGY 312 Respiratory, Renal, & Cardiovascular Physiology (3 credits)
- PHGY 313 Blood, Gastrointestinal, & Immune Systems Physiology (3 credits)
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- 12-13 credits selected as follows:
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    - BIOL 201 Cell Biology and Metabolism (3 credits)
  - 3 credits, one of:
    - BIOL 309 Mathematical Models in Biology (3 credits)
    - BIOL 373 Biometry (3 credits)
    - COMP 202 Foundations of Programming (3 credits)
    - COMP 250 Introduction to Computer Science (3 credits)
    - PSYC 305 Stats for Experimental Design (3 credits)
  - 3 credits, one of:
    - CHEM 203 Survey of Physical Chemistry (3 credits)
    - CHEM 204 Physical Chemistry/Biological Sciences 1 (3 credits)
    - BIOC 312 Biochemistry of Macromolecules (3 credits)
  - 3-4 credits, one of:
    - ANAT 214 Systemic Human Anatomy (3 credits)
    - ANAT 261 Introduction to Dynamic Histology (4 credits)
    - ANAT 316 Human Visceral Anatomy (3 credits)
### Upper Level Physiology (ULP) Courses

9 credits selected from the following Upper Level Physiology (ULP) courses:

All Physiology courses 400-level and above.

**Note:**
The 6-credit course PHGY 459D1/D2 equals 3 credits of ULP and 3 credits of electives.
The 9-credit course PHGY 461D1/D2 equals 3 credits of ULP and 6 credits of electives.

- ANAT 541 Cell and Molecular Biology of Aging (3 credits)
- BIOL 532 Developmental Neurobiology Seminar (3 credits)
- BMDE 519 Biomedical Signals and Systems (3 credits)
- EXMD 502 Advanced Endocrinology 01 (3 credits)
- EXMD 503 Advanced Endocrinology 02 (3 credits)
- EXMD 506 Advanced Applied Cardiovascular Physiology (3 credits)
- EXMD 507 Advanced Applied Respiratory Physiology (3 credits)
- EXMD 508 Advanced Topics in Respiration (3 credits)
- MIMM 413 Parasitology (3 credits)
- MIMM 414 Advanced Immunology (3 credits)
- MIMM 465 Bacterial Pathogenesis (3 credits)
- MIMM 466 Viral Pathogenesis (3 credits)
- PSYC 470 Memory and Brain (3 credits)
- PSYT 500 Advances: Neurobiology of Mental Disorders (3 credits)

### Upper Level Physiology (ULP) Courses

9 credits selected from the following Upper Level Physiology (ULP) courses:

All Physiology courses 400-level and above.

**Note:**
The 6-credit course PHGY 459D1/D2 equals 3 credits of ULP and 3 credits of electives.
The 9-credit course PHGY 461D1/D2 equals 3 credits of ULP and 6 credits of electives.

- PHGY 425 Analyzing Physiological Systems (3 credits)
- PHGY 451 Advanced Neurophysiology (3 credits)
- PHGY 459D1/D2 the 6-credit course equals 3 credits of ULP and 3 credits of electives.
- PHGY 461D1/D2 the 9-credit course equals 3 credits of ULP and 6 credits of electives.
- PHGY 488 Stem Cell Biology (3 credits) *(New Course)*
- PHGY 502 Exercise Physiology (3 credits)
- PHGY 508 Advanced Renal Physiology (3 credits)
- PHGY 513 Cellular Immunology (3 credits)
- PHGY 515 Physiology of Blood 1 (3 credits)
- PHGY 516 Physiology of Blood 2 (3 credits)
- PHGY 518 Artificial Cells (3 credits)
- PHGY 520 Ion Channels (3 credits)
- PHGY 524 Chronobiology (3 credits)
- PHGY 531 Topics in Applied Immunology (3 credits)
- PHGY 550 Physiology of Bone (3 credits)
- PHGY 552 Cellular and Molecular Physiology (3 credits)
- PHGY 556 Topics in Systems Neuroscience (3 credits)
- PHGY 560 Light Microscopy for the Life Sciences (3 credits)
- ANAT-541 Cell and Molecular Biology of Aging (3 credits)
- BIOL 532 Developmental Neurobiology Seminar (3 credits)
- BMDE 519 Biomedical Signals and Systems (3 credits)
- BMDE 505 Cell and Tissue Engineering (3 credits)
- EXMD 502 Advanced Endocrinology 01 (3 credits)
- EXMD 503 Advanced Endocrinology 02 (3 credits)
- EXMD 506 Advanced Applied Cardiovascular Physiology (3 credits)
- EXMD 507 Advanced Applied Respiratory Physiology (3 credits)
- EXMD 508 Advanced Topics in Respiration (3 credits)
- MIMM 413 Parasitology (3 credits)
- MIMM 414 Advanced Immunology (3 credits)
- MIMM 465 Bacterial Pathogenesis (3 credits)
- MIMM 466 Viral Pathogenesis (3 credits)
- MIMM 509 Inflammatory Process (3 credits)
- PSYC 470 Memory and Brain (3 credits)
- PSYT 500 Advances: Neurobiology of Mental Disorders (3 credits)
<table>
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<th>Upper Level Science (ULS) Courses</th>
<th>Proposed program (list courses as follows: Subj Code/Crse Num, Title, Credit weight, under the headings of: Required Courses, Complementary Courses, Elective Courses)</th>
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<tr>
<td>6 credits selected from the Upper-Level Science (ULS) course list as follows: Note: For Anatomy, Chemistry, Neurology, and Neurosurgery: select from all courses 300 level and above and the ULS courses listed below. For Biochemistry, Computer Science, Microbiology and Immunology, Mathematics, Physics, and Pathology: select from all courses 300 level and above. For Biology, Experimental Medicine, Pharmacology, and Psychology: select from the ULS courses listed below. ANAT 214 Systemic Human Anatomy (3 credits) ANAT 261 Introduction to Dynamic Histology (4 credits) ANAT 262 Introductory Molecular and Cell Biology (3 credits) BIOL 300 Molecular Biology of the Gene (3 credits) BIOL 303 Developmental Biology (3 credits) BIOL 309 Mathematical Models in Biology (3 credits) BIOL 313 Eukaryotic Cell Biology (3 credits) BIOL 314 Molecular Biology of Oncogenes (3 credits) BIOL 324 Ecological Genetics (3 credits) BIOL 370 Human Genetics Applied (3 credits) BIOL 373 Biometry (3 credits) BIOL 389 Laboratory in Neurobiology (3 credits) BIOL 416 Genetics of Mammalian Development (3 credits) BIOL 468 Independent Research Project 3 (6 credits) BIOL 518 Advanced Topics in Cell Biology (3 credits) BIOL 520 Gene Activity in Development (3 credits) BIOL 524 Topics in Molecular Biology (3 credits) BIOL 532 Developmental Neurobiology Seminar (3 credits) BIOL 544 Genetic Basis of Life Span (3 credits) BIOL 551 Molecular Biology: Cell Cycle (3 credits) BIOL 575 Human Biochemical Genetics (3 credits) BIOL 588 Advances in Molecular/Cellular Neurobiology (3 credits)</td>
<td>6 credits selected from the following Upper-Level Science (ULS) courses list as follows: Note: For Anatomy, Chemistry, Neurology, and Neurosurgery: select from all courses 300 level and above and the ULS courses listed below. For Biochemistry, Computer Science, Microbiology and Immunology, Mathematics, Physics, and Pathology: select from all courses 300 level and above. For Anatomy, Biology, Experimental Medicine, Pharmacology, and Psychology: select from the ULS courses listed below: ANAT 214 Systemic Human Anatomy (3 credits) ANAT 261 Introduction to Dynamic Histology (4 credits) ANAT 262 Introductory Molecular and Cell Biology (3 credits) ANAT 321 Neuroanatomy (3 credits) ANAT 322 Neuroendocrinology (3 credits) ANAT 365 Cellular Trafficking (3 credits) ANAT 381 Basis of Embryology (3 credits) ANAT 416 Development, Disease, Regeneration (3 credits) ANAT/BIOC 458 Membranes &amp; Cellular Signaling (3 credits) ANAT 541 Cell &amp; Molecular Biology of Aging (3 credits) ANAT 542 Transmission Electron Microscopy (3 credits) ANAT 565 Advanced Topics in Membrane Trafficking (3 credits) BIOL 300 Molecular Biology of the Gene (3 credits) BIOL 303 Developmental Biology (3 credits) BIOL 309 Mathematical Models in Biology (3 credits) BIOL 313 Eukaryotic Cell Biology (3 credits) BIOL 314 Molecular Biology of Oncogenes (3 credits) BIOL 324 Ecological Genetics (3 credits) BIOL 370 Human Genetics Applied (3 credits) BIOL 373 Biometry (3 credits) BIOL 389 Laboratory in Neurobiology (3 credits) BIOL 416 Genetics of Mammalian Development (3 credits) BIOL 468 Independent Research Project 3 (6 credits) BIOL 518 Advanced Topics in Cell Biology (3 credits) BIOL 520 Gene Activity in Development (3 credits) BIOL 524 Topics in Molecular Biology (3 credits) BIOL 532 Developmental Neurobiology Seminar (3 credits) BIOL 544 Genetic Basis of Life Span (3 credits) BIOL 551 Molecular Biology: Cell Cycle (3 credits) BIOL 575 Human Biochemical Genetics (3 credits) BIOL 588 Advances in Molecular/Cellular Neurobiology (3 credits)</td>
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Attach extra page(s) as needed
**Existing program (list courses as follows: Subj Code/Crse Num, Title, Credit weight, under the headings of: Required Courses, Complementary Courses, Elective Courses)**

- CHEM 214 Physical Chemistry/Biological Sciences 2 (3 credits)
- EXMD 401 Physiology and Biochemistry Endocrine Systems (3 credits)
- EXMD 502 Advanced Endocrinology 01 (3 credits)
- EXMD 503 Advanced Endocrinology 02 (3 credits)
- EXMD 504 Biology of Cancer (3 credits)
- EXMD 506 Advanced Applied Cardiovascular Physiology (3 credits)
- EXMD 507 Advanced Applied Respiratory Physiology (3 credits)
- EXMD 508 Advanced Topics in Respiration (3 credits)
- EXMD 509 Gastrointestinal Physiology and Pathology (3 credits)
- EXMD 510 Bioanalytical Separation Methods (3 credits)
- NEUR 310 Cellular Neurobiology (3 credits)
- PHAR 503 Drug Design and Development 1 (3 credits)
- PHAR 504 Drug Design and Development 2 (3 credits)
- PHAR 562 General Pharmacology 1 (3 credits)
- PHAR 563 General Pharmacology 2 (3 credits)
- PHAR 599 Pharmacology Research Project (6 credits)
- PSYC 302 The Psychology of Pain (3 credits)
- PSYC 311 Human Cognition and the Brain (3 credits)
- PSYC 318 Behavioural Neuroscience 2 (3 credits)
- PSYC 342 Hormones and Behaviour (3 credits)
- PSYC 353 Laboratory in Human Perception (3 credits)
- PSYC 410 Special Topics in Neuropsychology (3 credits)
- PSYC 427 Sensorimotor Behaviour (3 credits)
- PSYC 470 Memory and Brain (3 credits)
- PSYC 505 The Psychology of Pain (3 credits)
- PSYC 522 Neurochemistry and Behaviour (3 credits)
- PSYC 526 Advances in Visual Perception (3 credits)
- PSYT 500 Advances: Neurobiology of Mental Disorders (3 credits)

**Proposed program (list courses as follows: Subj Code/Crse Num, Title, Credit weight, under the headings of: Required Courses, Complementary Courses, Elective Courses)**

- CHEM 214 Physical Chemistry/Biological Sciences 2 (3 credits)
- EPIB 501 Population Health and Epidemiology (3 credits)
- EXMD 401 Physiology and Biochemistry Endocrine Systems (3 credits)
- EXMD 502 Advanced Endocrinology 01 (3 credits)
- EXMD 503 Advanced Endocrinology 02 (3 credits)
- EXMD 504 Biology of Cancer (3 credits)
- EXMD 506 Advanced Applied Cardiovascular Physiology (3 credits)
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- EXMD 508 Advanced Topics in Respiration (3 credits)
- EXMD 509 Gastrointestinal Physiology and Pathology (3 credits)
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- PSYC 522 Neurochemistry and Behaviour (3 credits)
- PSYC 526 Advances in Visual Perception (3 credits)
- PSYT 500 Advances: Neurobiology of Mental Disorders (3 credits)

**Note:** Students may opt to replace 3 credits of the 6 credits of Upper Level Science with 3 credits selected from the following list:

- PHIL 341 Philosophy of Science 1 (3 credits)
- PHIL 343 Biomedical Ethics (3 credits)
- REDM 410 Writing Science Articles (3 credits)
- COMP 364 Computer Tools for Life Science (3 credits)

Attach extra page(s) as needed.
### 9. Approvals

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<th>Routing Sequence</th>
<th>Name</th>
<th>Signature</th>
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<tbody>
<tr>
<td>Department</td>
<td>Dr. John Orlowski</td>
<td>J. Orlowski</td>
<td>03/10/13</td>
</tr>
<tr>
<td>Curric/Acad Committee</td>
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Submitted by

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<tr>
<th>Name</th>
<th>Sonia Viselli</th>
<th>To be completed by ARR:</th>
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<tbody>
<tr>
<td>Phone</td>
<td>514-398-3688</td>
<td>CIP Code</td>
</tr>
<tr>
<td>Email</td>
<td><a href="mailto:sonia.viselli@mccall.ca">sonia.viselli@mccall.ca</a></td>
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<tr>
<td>Submission Date</td>
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