Proposal: New Courses

BIOL 2030 3.0. BIOL 2030 3.0 is a "no lab" version of BIOL 2030 4.0, created to be able to offer this second year core course in the fall without labs. The course director feels learning outcomes cannot be met for the labs in this course without in-person labs, and the course is too large to be able to offer on campus labs with social distancing. A non-lab version of this course was on the books until some time in the '90s.

BIOL 2071 3.0 BIOL 2071 is a "no lab" version of BIOL 2070, created to ensure students are not delayed in degree progress by the fact that BIOL 2070 cannot be offered without in person labs, because of the emphasis on practical skill development in this course. BIOL 2071 will meet all learning outcomes in BIOL 2070 except hands-on practical lab skills.

Changes to BIOL 2030 4.0 and 2070 3.0: CCEs to the above sister courses are being added.

Paula Wison
Professor, Department of Biology

Changes to Existing Course

Faculty:

Department:	Biology	**Date of Submission:**	May 28, 2020
Course Number:	2030 4.0	**Effective Session:**	F2020
Course Title:	Animals		

Type of Change:

☐	in pre-requisite(s)/co-requisite(s)	☐	in cross-listing
☐	in course number/level	☒	in degree credit exclusion(s)
☐	in credit value	☐	regularize course (from Special Topics)
☐	in title (max. 40 characters for short title)	☐	in course format/mode of delivery *
☐	in Calendar description (max. 40 words or 200 characters)	☐	retire/expire course
☐	other (please specify):	☐	

Change From:	**To:**
A study of the diversity of animals, their structure, physiology and evolution. Prerequisite: SC/BIOL 1000 3.00 and SC/BIOL 1001 3.00 or SC/ISCI 1110 6.00 or both SC/ISCI 1101 3.00 and SC/ISCI 1102 3.00.	A study of the diversity of animals, their structure, physiology and evolution. Prerequisite: SC/BIOL 1000 3.00 and SC/BIOL 1001 3.00 or SC/ISCI 1110 6.00 or both SC/ISCI 1101 3.00 and SC/ISCI 1102 3.00. **Course Credit Exclusion: SC/BIOL 2030 3.0**

Rationale:

Updating course description to reflect CCE to new 3.0 version of BIOL 2030.

Note: For course proposals involving cross-listings, integrations and degree credit exclusions, approval from all of the relevant Faculties/department is required.

Note: Since one change (such as a change in year level or credit value) may result in several other changes (e.g., to the course description, evaluation, instruction, bibliography, etc.), please submit as many details as possible. If there are several changes, please feel free to use a New Course Proposal Form in order to ensure that all the required information is included.

* Note: If there is a technology component to the course, a statement is required from ATS indicating whether resources are adequate to support the course. Courses converted from face-to-face to an on-line delivery mode should follow the instructions provided on page 4 of the New Course Proposal Form to provide revised 'Course Design' and 'Method of Instruction" information.

Changes to Existing Course

Faculty:

Department: Biology

Date of Submission: May 28, 2020

Course Number: 2070 3.0

Effective Session: F2020

Course Title: Research Methods in Cell and Molecular Biology

Type of Change:

☐	in pre-requisite(s)/co-requisite(s)	☐	in cross-listing
☐	in course number/level	X	in degree credit exclusion(s)
☐	in credit value	☐	regularize course (from Special Topics)
☐	in title (max. 40 characters for short title)	☐	in course format/mode of delivery *
☐	in Calendar description (max. 40 words or 200 characters)	☐	retire/expire course
☐	other (please specify):	☐	

Change From:	**To:**
This course focuses on laboratory techniques in the life sciences. Practical research skills are developed through experiential learning using current biochemistry, cell and molecular biology techniques. Research skills include scientific writing, data analysis/interpretation, experimental design and hypothesis testing. Prerequisites: (1) Both SC/BIOL 1000 3.00 and SC/BIOL 1001 3.00, or SC/ISCI 1110 6.00, or both SC/ISCI 1101 3.00 and SC/ISCI 1102 3.00; and (2) both SC/CHEM 1000 3.00 and SC/CHEM 1001 3.00, or both SC/ISCI 1201 3.00 and SC/ISCI 1202 3.00, or SC/ISCI 1210 6.00	This course focuses on laboratory techniques in the life sciences. Practical research skills are developed through experiential learning using current biochemistry, cell and molecular biology techniques. Research skills include scientific writing, data analysis/interpretation, experimental design and hypothesis testing. Prerequisites: (1) Both SC/BIOL 1000 3.00 and SC/BIOL 1001 3.00, or SC/ISCI 1110 6.00, or both SC/ISCI 1101 3.00 and SC/ISCI 1102 3.00; and (2) both SC/CHEM 1000 3.00 and SC/CHEM 1001 3.00, or both SC/ISCI 1201 3.00 and SC/ISCI 1202 3.00, or SC/ISCI 1210 6.00 **Course Credit Exclusion: SC/BIOL 2071 3.0**

Rationale:

Updating course description to reflect CCE to BIOL 2071 3.0.

Note: For course proposals involving cross-listings, integrations and degree credit exclusions, approval from all of the relevant Faculties/department is required.

Note: Since one change (such as a change in year level or credit value) may result in several other changes (e.g., to the course description, evaluation, instruction, bibliography, etc.), please submit as many details as possible. If there are several changes, please feel free to use a New Course Proposal Form in order to ensure that all the required information is included.

* Note: If there is a technology component to the course, a statement is required from ATS indicating whether resources are adequate to support the course. Courses converted from face-to-face to an on-line delivery mode should follow the instructions provided on page 4 of the New Course Proposal Form to provide revised 'Course Design' and 'Method of Instruction" information.

COMMITTEE ON ACADEMIC STANDARDS, CURRICULUM AND PEDAGOGY TEMPLATE

NEW COURSE PROPOSAL FORM

Faculty: Indicate all relevant Faculty(ies)	Science

Department: Indicate department and course prefix (e.g. Languages, GER)	BIOLOGY, BIOL	**Date of Submission:**	2020-05-20

Course Number: Special Topics courses Include variance (e.g. HUMA 3000C 6.0, Variance is "C")	BIOL 2030	**Var:**	**Academic Credit Weight:** Indicate both the fee, and MTCU weight if different from academic weight (e.g. AC=6, FEE=8, MET=6	3.0

Course Title: The official name of the course as it will appear in the Undergraduate Calendar and on the Repository	Animals
Short Title: Appears on any documents where space is limited - e.g. transcripts and lecture schedules - **maximum 40 characters**	

With every new course proposal it is the Department's responsibility to ensure that new courses do not overlap with existing courses in other units. If similarities exist, consultation with the respective departments is necessary to determine degree credit exclusions and/or cross-listed courses.

Brief Course Description:

Maximum 2000 characters
(approximately 300 words including spaces and punctuation).

The course description should be carefully written to convey what the course is about. It should be followed by a statement of prerequisites and co-requisites, if applicable. This description appears in the calendar.

For editorial consistency, and in consideration of the various uses of the Calendars, verbs should be in the present tense (i.e., "This course analyzes the nature and extent of...," rather than "This course will analyze...")

A study of the diversity of animals, their structure, physiology and evolution.

Prerequisite: SC/BIOL 1010 6.00 or SC/BIOL 1000 3.00 and SC/BIOL 1001 3.00 or SC/ISCI 1110 6.00 or both SC/ISCI 1101 3.00 and SC/ISCI 1102 3.00.

Course Credit Exclusion: SC/BIOL 2030 4.0

Generic Course Description:

This is the description of the "Parent / Generic course" for Special Topics courses under which variances of the "Generic" course can be offered in different years (Max. 40 words). Generic course descriptions are published in the calendar.

List all degree credit exclusions, prerequisites, integrated courses, and notes below the course description.

Expanded Course Description:

Please provide a detailed course description, including topics / theories and learning objectives, as it will appear in supplemental calendars.

The purpose of this course is to introduce the diversity of animals through discussion of lifestyles/cycles, relationships between structure and function (internal and external anatomy), and the evolutionary history of unicellular and multicellular eukaryotic organisms. In this course, both living and fossil forms are considered (although an emphasis is placed on extant organisms), by surveying across a range of phyla. General topics for consideration include classification, phylogeny and development, as well as the systems involved in locomotion, feeding, digestion, circulation, communication, osmoregulation, gas exchange, reproduction and sensory operations.

Upon course completion, students learning outcomes will include being able to:
1. Discuss what unicellular eukaryotes and animals are using specific characteristics that unify the different groups of organisms.
2. Discuss the diversity of unicellular eukaryotes and animals in terms of development, structure and habitats.
3. Define major animal phyla based on their respective unifying characteristics.
4. Describe, with specific examples, how body form and structure of unicellular eukaryotes and animals relate to function.
5. Describe, using examples, how unicellular eukaryotes and animals can impact human health.
6. Describe the evolution of vertebrate animals from aquatic ancestors to terrestrial forms.
7. Outline mechanisms that specific (select) unicellular eukaryotes and animals have evolved for locomotion, osmoregulation, feeding and digestion, development/reproduction, and sensing the world around them.

Course Design:

Indicate how the course design supports students in achieving the learning objectives. For example, in the absence of scheduled contact hours what role does student-to-student and/or student-to-instructor communication play, and how is it encouraged?

Detail any aspects of the content, delivery, or learning goals that involve "face-to-face" communication, non-campus attendance or experiential education components.

Alternatively, explain how the course design encourages student engagement and supports student learning in the absence of substantial on-campus attendance.

The course is designed to provide students with at least 3 contact hours per week in lecture format and weekly scheduled office hours during which students can engage in student-to-instructor communication. A Moodle site is provided, where all lecture material is posted as well as supplemental material (e.g. videos, images, etc.). For students unable to participate in scheduled office hours, individual appointments can be made outside of the aforementioned scheduled time.

Instruction:

1. Planned frequency of offering and number of sections anticipated (every year, alternate years, etc.).
2. Number of department members currently competent to teach the course.
3. Instructor(s) likely to teach the course in the coming year.
4. An indication of the number of contact hours (defined in terms of hours, weeks, etc.) involved, in order to indicate whether an effective length of term is being maintained **OR** in the absence of scheduled contact hours a detailed breakdown of the estimated time students are likely to spend engaged in learning activities required by the course.

1. 2 x 1.5 lecture h per week
2. 4
3. Scott P. Kelly
4. 36 lecture hours

Evaluation:

A detailed percentage breakdown of the basis of evaluation in the proposed course must be provided.

If the course is to be integrated, the additional requirements for graduate students are to be listed.

If the course is amenable to technologically mediated forms of delivery please identify how the integrity of learning evaluation will be maintained. (e.g. will "on-site" examinations be required, etc.)

Test 1 – 20%
Test 2 – 30%
Test 3 – 20%

Assignment 1 – 15%
Assignment 2 – 15%

NOTE: No Final Exam.

Bibliography:

A READING LIST MUST BE INCLUDED FOR ALL NEW COURSES

The Library has requested that the reading list contain complete bibliographical information, such as full name of author, title, year of publication, etc., and that you distinguish between required and suggested readings. A statement is required from the bibliographer responsible for the discipline to indicate whether resources are adequate to support the course.

Also please list any online resources.

If the course is to be integrated (graduate/ undergraduate), a list of the additional readings to be required of graduate students must be included. If no additional readings are to be required, a rationale should be supplied.

LIBRARY SUPPORT STATEMENT MUST BE INCLUDED.

Hickman, CP, SL Keen, A Larson, D Eisenhour. Animal Diversity, 8th (2018) or 7th (2015) Editions. McGraw Hill, Toronto.

Other Resources:

A statement regarding the adequacy of physical resources (equipment, space, etc.) must be appended. If other resources will be required to mount this course, please explain

COURSES WILL NOT BE APPROVED UNLESS IT IS CLEAR THAT ADEQUATE RESOURCES ARE AVAILABLE TO SUPPORT IT.

Course Rationale:

The following points should be addressed in the rationale:

How the course contributes to the learning objectives of the program / degree.

The relationship of the proposed course to other existing offerings, particularly in terms of overlap in objectives and/or content. If inter-Faculty overlap exists, some indication of consultation with the Faculty affected should be given.

The expected enrolment in the course.

This course provides a foundation in animal biology. Upon this, a higher degree of expertise can be built as students progress through higher levels courses in the animal physiology stream within the Department of Biology.

The most pressing rationale for proposing BIOL 2030 as a 3.0 credit course (instead of its current 4.0 credit status) is to provide a lab-free unit for the Fall 2020 semester that cannot be disrupted by cancellation of in-person instruction. The execution of online/remote labs for this course is not possible.

Faculty and Department Approval for Cross-listings:

If the course is to be cross-listed with another department, this section needs to be signed by all parties. In some cases there may be more than two signatures required (i.e. Mathematics, Women's Studies). In the majority of the cases either the Undergraduate Director or Chair of a unit approves the agreement to cross-list. All relevant signatures must be obtained prior to submission to the Faculty curriculum committee.

Dept:	Signature (Authorizing cross-listing)	Department	Date
Dept:	Signature (Authorizing cross-listing)	Department	Date
Dept:	Signature (Authorizing cross-listing)	Department	Date

Accessible format can be provided upon request.

COMMITTEE ON ACADEMIC STANDARDS, CURRICULUM AND PEDAGOGY TEMPLATE

NEW COURSE PROPOSAL FORM

Faculty: Indicate all relevant Faculty(ies)	SC

Department: Indicate department and course prefix (e.g. Languages, GER)	BIOL	**Date of Submission:**	May 2020

Course Number: Special Topics courses Include variance (e.g. HUMA 3000C 6.0, Variance is "C")	2071	**Var:**	**Academic Credit Weight:** Indicate both the fee, and MTCU weight if different from academic weight (e.g. AC=6, FEE=8, MET=6	3	

Course Title: The official name of the course as it will appear in the Undergraduate Calendar and on the Repository	Techniques and Methods in Cell and Molecular Biology
Short Title: Appears on any documents where space is limited - e.g. transcripts and lecture schedules - **maximum 40 characters**	Methods in Cell and Molecular Biology

With every new course proposal it is the Department's responsibility to ensure that new courses do not overlap with existing courses in other units. If similarities exist, consultation with the respective departments is necessary to determine degree credit exclusions and/or cross-listed courses.

Brief Course Description:

Maximum 2000 characters
(approximately 300 words including spaces and punctuation).

The course description should be carefully written to convey what the course is about. It should be followed by a statement of prerequisites and co-requisites, if applicable. This description appears in the calendar.

For editorial consistency, and in consideration of the various uses of the Calendars, verbs should be in the present tense (i.e., "This course analyzes the nature and extent of...," rather than "This course will analyze...")

This course explores contemporary methods and skills required for basic research in biochemistry and cell and molecular biology.
It introduces students to equipment, techniques, and theory relevant to current research, and its application to solve modern and historic problems in biology.

Prerequisites: SC/BIOL 1010 6.0 OR SC/BIOL 1000 3.0 AND SC/BIOL 1001 3.0; SC/CHEM 1000 3.0 AND SC/CHEM 1001 3.0

CCE: SC/BIOL 2070 3.0

Generic Course Description:

This is the description of the "Parent / Generic course" for Special Topics courses under which variances of the "Generic" course can be offered in different years (Max. 40 words). Generic course descriptions are published in the calendar.

List all degree credit exclusions, prerequisites, integrated courses, and notes below the course description.

Expanded Course Description:

Please provide a detailed course description, including topics / theories and learning objectives, as it will appear in supplemental calendars.

This course provides students with knowledge about the methods, equipment, and theory required in the practice of contemporary biochemistry, cell, and molecular biology research.

Individual topics/examples may be updated periodically to reflect advances in the field.

Topics/theories/techniques:

Experimental design and hypothesis testing
Analysis and interpretation of data
Scientific writing and assessment of current scientific publications
Basic calculations utilized in biochemistry, cell, and molecular biology
Preparative techniques in biochemistry, cell, and molecular biology
Common equipment used in biochemistry, cell, and molecular biology
Genetic engineering, nucleic acid manipulation, and analysis
Manipulation of microorganisms (e.g. bacteria, yeast)
Microscopy

Learning Objectives:

(Please note that the following may be updated/modified with advances in the field/instrumentation)

Students who complete this course will be able to:

- Develop a testable hypothesis
- Identify/develop pertinent control experiments
- Articulate how common preparative techniques in molecular biology work, and how to conduct them (e.g. PCR)
- Articulate how common analytical techniques in cell and molecular biology work, and how to conduct them (e.g. electrophoresis, blotting, protein-protein interaction assays)
- Describe how these basic techniques have been modified to solve methodological problems in biology (e.g. nucleic acid sequencing, site-directed mutagenesis)
- Design a sequence of experiments to answer a biological question
- Conduct basic calculations used in molecular biology
- Interpret different forms of experimental data correctly
- Use biological terminology appropriately in the context of scientific writing
- Write, recognize, and successfully identify a scientific citation
- Successfully utilize common reference databases for both literature and datasets
- Predict experimental results
- Communicate findings effectively in written form
- Acquire, assess, and critique scientific articles relevant to course topics
- Plan a genetic engineering experiment from conception to vector delivery using both conventional enzymatic methods and contemporary methods using recombination

- Compare and contrast selected cell and molecular technology techniques, considering purpose, advantages/disadvantages, resources, etc.
- Trouble-shoot problems with simple cell/molecular biology techniques

Course Design:

Indicate how the course design supports students in achieving the learning objectives. For example, in the absence of scheduled contact hours what role does student-to-student and/or student-to-instructor communication play, and how is it encouraged?

Detail any aspects of the content, delivery, or learning goals that involve "face-to-face" communication, non-campus attendance or experiential education components.

Alternatively, explain how the course design encourages student engagement and supports student learning in the absence of substantial on-campus attendance.

The course is designed for online delivery, using a combination of synchronous and asynchronous activities.

Content will be delivered through mini-lectures, videos that cover current research in the department, close reading through online social annotation, and other rich media resources. Course content is presented to allow students to review/revisit as often as required.

Weekly assessments will be administered through the LMS and will permit instructors to provide targeted supplementary material in mini-lecture format if the need arises (in a "just-in-time" fashion), or during planned synchronous student activities.

Weekly synchronous student activities will include the use of collaboration tools such as Zoom for Q&A sessions, review, and special sessions for inviting faculty experts to discuss current research.

An emphasis will be placed on process-based skills (e.g. PCR primer design, scientific writing, interpretation of experimental data, utilization of reference databases) to allow students to gain experience with current techniques in the field. Regular formative and summative assignments will be used to assess how well students have met the learning objectives of the course.

Instruction:

1. Planned frequency of offering and number of sections anticipated (every year, alternate years, etc.).
2. Number of department members currently competent to teach the course.
3. Instructor(s) likely to teach the course in the coming year.
4. An indication of the number of contact hours (defined in terms of hours, weeks, etc.) involved, in order to indicate whether an effective length of term is being maintained **OR** in the absence of scheduled contact hours a detailed breakdown of the estimated time students are likely to spend engaged in

1. Offered F and W terms each year, summer as necessary
2. All faculty members with a background in cellular and molecular biology are qualified to teach this course.
3. Dr. Christopher Jang will teach this course in the F2020 term.
4. A minimum of six to eight hours of learning time is expected weekly. This time includes reading/watching mini-lectures, processing content, and completion of weekly course activities and assessments.

learning activities required by the course.	

Evaluation:

A detailed percentage breakdown of the basis of evaluation in the proposed course must be provided.

If the course is to be integrated, the additional requirements for graduate students are to be listed.

If the course is amenable to technologically mediated forms of delivery please identify how the integrity of learning evaluation will be maintained. (e.g. will "on-site" examinations be required, etc.)

Minor Assignments / Participation

- Moodle Quizzes (12.5% total)
- Reading and Social Annotation Assignments (12.5% total)

Major Written Assignments / Projects (12.5% each)

- Research and Scientific Writing I
- PCR, Reference Databases, and Data Analysis I
- Electrophoresis and Recombinant DNA
- Quantitative Methods & Scientific Writing II
- Functional Assays & Data Analysis II
- Protein Biochemistry & Scientific Writing III

Bibliography:

A READING LIST MUST BE INCLUDED FOR ALL NEW COURSES

The Library has requested that the reading list contain complete bibliographical information, such as full name of author, title, year of publication, etc., and that you distinguish between required and suggested readings. A statement is required from the bibliographer responsible for the discipline to indicate whether resources are adequate to support the course.

Also please list any online resources.

If the course is to be integrated (graduate/ undergraduate), a list of the additional readings to be required of graduate students must be included. If no additional readings are to be required, a rationale should be supplied.

LIBRARY SUPPORT STATEMENT MUST BE INCLUDED.

Readings will include primary and secondary literature published in standard scientific journals available from the York University Library, such as:

- Current Issues in Molecular Biology
- Current Protocols in Molecular Biology
- Journal of Cell Biology
- Journal of Molecular Biology
- Nature Cell Biology

Other Resources:

A statement regarding the adequacy of physical resources (equipment, space, etc.) must be appended. If other resources will be required to mount this course, please explain

COURSES WILL NOT BE APPROVED UNLESS IT IS CLEAR THAT ADEQUATE RESOURCES ARE AVAILABLE TO SUPPORT IT.

Course Rationale:

The following points should be addressed in the rationale:

How the course contributes to the learning objectives of the program / degree.

The relationship of the proposed course to other existing offerings, particularly in terms of overlap in objectives and/or content. If inter-Faculty overlap exists, some indication of consultation with the Faculty affected should be given.

The expected enrolment in the course.

A research methods course in cell/molecular biology is required to temporarily replace the traditional in-person laboratory in cell and molecular biology (BIOL 2070).

BIOL 2070 is the existing second year practical course that helps students develop research skills in biochemistry, cell biology, and molecular genetics. It builds on skills/knowledge from 1000-level BIOL and CHEM courses and helps prepare students for more advanced upper-level BIOL courses. BIOL 2070 is a key core course and is prerequisite to many upper year courses in BSc Biology and BSc Biochemistry programs. Because of its emphasis on practical in-lab experience, it cannot be offered in a remote or online format.

To permit normal student progression through the program during the shift to online instruction in the Fall of 2020, BIOL 2071 is being proposed as a temporary course to replace BIOL 2070. It is designed to meet as many of the learning outcomes of BIOL 2070 as possible minus the hands-on practical experience.

This course may also potentially improve the quality of the undergraduate program in Biology, as it will facilitate improvements in online pedagogy for future terms and allow us to explore and establish best practices for course management, resource allocation, and improvement of the student experience for future offerings of BIOL 2070.

Enrollment is expected to be approximately 250 students.

Faculty and Department Approval for Cross-listings:

If the course is to be cross-listed with another department, this section needs to be signed by all parties. In some cases there may be more than two signatures required (i.e. Mathematics, Women's Studies). In the majority of the cases either the Undergraduate Director or Chair of a unit approves the agreement to cross-list. All relevant signatures must be obtained prior to submission to the Faculty curriculum committee.

Dept:	Signature (Authorizing cross-listing)	Department	Date
Dept:	Signature (Authorizing cross-listing)	Department	Date
Dept:	Signature (Authorizing cross-listing)	Department	Date

Accessible format can be provided upon request.