GUIDELINES FOR COMPLETION OF UNDERGRADUATE / CERTIFICATE COURSE AND CURRICULUM CHANGES*

*Course and curriculum changes refers to all course introductions, modifications, and deletions, as well as modifications to programs.

Course/curriculum change forms are available at: http://umanitoba.ca/admin/governance/forms/index.html. Please ensure that you are using the most current version of Adobe Reader or Adobe Acrobat Pro when completing the forms (https://get.adobe.com/reader/).

Deadlines for submission - Please refer to the SCCCC Timetable for Submissions for specific dates (http://umanitoba.ca/admin/governance/meetings/index.html).

- **Fall deadlines:**
  - **mid-September** - for proposals involving a net increase of 9 or fewer credit hours, for consideration by the Senate Committee on Curriculum and Course Changes (SCCCC) only
  - **mid-August** - for proposals involving a net increase of greater than 9 credit hours, for consideration by the Senate Planning and Priorities Committee (SPPC) and SCCCC

- **Spring Deadline:**
  - **mid-February** - for proposals involving a net increase of 9 or fewer credit hours, for consideration by the SCCCC only
  
  (See Appendix I for examples of what is meant by a “net change in credit hours”.)

Both a hard copy and an electronic copy of the proposal must be submitted to the Office of the University Secretary. The hard copy must be single-sided original documents (i.e. no photocopies). Please do not staple. The electronic copy must be provided as a single PDF file (file including the summary sheet, course/curriculum change forms, and supporting documentation). PDF portfolios will not be accepted.

Faculties, colleges, and schools are strongly encouraged to consult with the Vice-Provost (Integrated Planning and Academic Programs), the Academic Specialist (Office of the University Secretary), and the University Budget Officer, as appropriate, at the outset of planning for substantial revisions to an existing program.

Information on the approval process for major amendments to, or major expansion of, an existing program is available on the webpage of the Vice-President (Academic) and Provost at http://umanitoba.ca/admin/vp_academic/academic_programs/3722.html.

I. SUMMARY OF PROPOSAL

- A **summary sheet** is to be provided with all course and curriculum changes submitted to the SCCCC. The summary sheets are to be organized by department where a faculty/college is departmentalized, and must include:
  - (a) in the following order, a list of all courses to be deleted, introduced, or modified [including subject code and course numbers (in alphabetic and ascending numerical order), course names, and credit hours];
  - (b) a statement of the net change in credit hours;
  - (c) brief descriptions of any program modifications.

- See Appendix I for examples of summary sheets.

- Changes resulting in a net increase of more than 9 credit hours will also be considered by the SPPC. Such proposals must be submitted to the Office of the University Secretary by the
mid-August deadline (see SCCC Timetable for Submissions) and must include a statement from
the Dean/Director concerning the resource implications of the proposal. The SPPC Program
Proposal Budget Form (http://umanitoba.ca/admin/governance/forms/index.html) must be
completed if the proposed changes involve a request for new resources.

- Proposals to substantially modify an existing curriculum should include, in addition:

  (a) **an executive summary** that highlights and provides a brief rationale for important changes
      and clearly states when the changes are to take effect. To ensure that program changes are
      reflected in the Academic Calendar, program modifications will be implemented (i.e. take
      effect) only for the next ensuing Fall Term. Program changes cannot be implemented in the
      Winter Term.

  (b) **current and revised program charts and descriptions** as they would appear in the
      Academic Calendar (including modifications to any list of required or elective courses in a
      program(s));

  (c) **a detailed transition plan** that describes:
      
      (i) a timeline for introducing the revised curriculum and phasing out the existing curriculum,
          including a proposed timeline for deleting any existing courses that would not form part of
          the revised curriculum;

      (ii) a transition plan that includes (1) a course map (or curriculum crosswalk), (2) describes a
          pathway(s) for continuing/existing students to complete their program and (3) outlines
          future steps associated with the transition to, or the implementation of, the revised
          curriculum;

      (iii) arrangements that would be made for continuing students to either complete the existing
          curriculum or transition to the revised curriculum;

  (d) **consultation with other units** that might be affected by the proposed program changes,
      including written statements of support from those units;

  (e) **a description of the resource implications**, including either any anticipated costs (including
      transitional and/or ongoing costs) that would arise from the introduction of a revised curriculum
      or a clear statement that the proposal is resource neutral. The SPPC Program Proposal
      Budget Form (http://umanitoba.ca/admin/governance/forms/index.html) must be completed if
      the proposed changes involve a request for new resources.
II. COMPLETING THE UNDERGRADUATE COURSE INTRODUCTION FORM

- Complete the course introduction form where:
  (i) a new course is being proposed
  (ii) an existing course is to be deleted and replaced for one of the following reasons:
    a. the course is to be renumbered
    b. the credit hours are to be modified
    c. the short course title (i.e. system title) is to be modified

- To change the short course title, a course number, or the number of credit hours, the current course must be deleted and re-introduced under a new short title and/or course number, as appropriate. A course deletion form is also required. See Section IV Completing the Undergraduate Course Deletion Form.

SECTION A – COURSE DETAILS

- Use the drop-down lists to indicate the Faculty/College/School and Department (or program where there is no department; e.g. Canadian Studies, Environmental Design) proposing the course introduction. NB In the Senate curriculum process, the Université de Saint-Boniface is considered a faculty.
- Subject code (e.g. ECON, CHEM, NURS, etc.) and Course number Proposed subject codes and course numbers must be confirmed with the Registrar’s Office (Calendar Coordinator; http://intranet.umanitoba.ca/student/records/contact.html) before a faculty/college/school submits its proposal for course and curriculum changes to the Office of the University Secretary for consideration by the SCCC.
- Long Title (maximum 90 characters) - e.g. History of Opera I: From Monteverdi to Mozart
- Short Title (maximum 30 characters) – e.g. History of Opera 1
- Credit Hours – indicate the number of credit hours here and in the course description.
- Grading mode – Use the drop-down list to indicate either “letter grade” or “pass/fail”. The course description must indicate where the grading mode is “pass fail”.
- First term offered – Use the drop-down list to select the next ensuing Fall Term and Year (normally) or to request a different term. Exceptions may apply for courses to take effect in the next ensuing Summer Term. Requests for exceptions may be noted manually on the form.

SECTION B – COURSE DESCRIPTION

Provide the course description exactly as it would appear in the Academic Calendar. Forms will be returned to the proposing academic unit for amendment where course descriptions are incomplete. See Appendix II for examples.

See Section II H Prerequisite, Corequisite, Pre- or Corequisite, & Mutually Exclusive Courses (below) for definitions of prerequisite, corequisite, pre- or corequisite, and mutually exclusive courses.

- In the first line, indicate the subject code, course number, long title, number of credit hours (e.g. MUSC 3230 Acoustics of Music Cr.Hrs. 3).
- For course modifications, do not indicate the past IMS course number at the beginning of a course description [i.e. (Formerly 017.336)].
In the body of the course description, provide the following information in the order listed:

i. indicate where a laboratory or field trip is required [e.g. (Laboratory required)];

ii. a brief course description (ideally not more than 4 – 5 lines);

iii. mutually exclusive and equivalent courses prefaced by “May not be held with” and indicated by the subject code and course number and including all applicable previous course numbers but not including IMS course numbers; be sure to include Université de Saint Boniface course numbers where equivalency exists;

iv. indicate any registration restrictions (see Section II D);

v. indicate any prerequisite, corequisite, pre- or corequisite courses by the subject code and course number (but not the course title). Include all applicable previous course numbers but not including course numbers from the legacy system (e.g. 017.336). In cases where a prerequisite course is no longer offered, use the phrase "or the former" in the prerequisite list (e.g., ECON 1010 and ECON 1020 or the former ECON 1200);

vi. indicate as a letter grade where a minimum grade for a prerequisite course, examination, or equivalency test is required [e.g. BIOL 1030 (C)];

vii. indicate where the course can be completed as a topics course multiple times under different titles;

viii. indicate where the grading mode is pass/fail.

SECTION C – RATIONALE FOR NEW COURSE

Provide a brief rationale for the course introduction, including a brief explanation of how it would fit into, or contribute to, an existing or proposed curriculum. Reasons for introducing a new course might include, but are not limited to: introducing new material into a program in keeping with advances and/or changes in the foci of a particular discipline or department; accommodating the expertise of a new faculty member; division of a spanned course into two single term courses.

Indicate if the course introduction replaces a current course or is a new required or elective course that will lead to program changes in your unit (see Section II F Resulting Changes to Programs).

SECTION D – REGISTRATION RESTRICTIONS

Indicate where registration is restricted to students in a particular faculty/college/school or academic program(s), including level or year of study. List the faculty/college/school and/or programs(s) (i.e. Honours) in the spaces provided. Indicate registration restrictions in the course description for the Academic Calendar. Contact the Registrar’s Office (Calendar Coordinator; http://intranet.umanitoba.ca/student/records/contact.html) to discuss options for restricting registration.

SECTION E – ADDITIONAL COURSE DETAILS

Laboratory / Field Trip Requirement – Use the drop-down list to indicate whether a laboratory or field trip is required. Laboratory and field trip requirements must be indicated in the course description (see Section II B and Appendix II).
Topics courses – Use the drop-down lists to indicate (i) whether the proposed course is a topics course (ii) whether a topics course can be held multiple times under different titles. Where a topics course can be held multiple times under different titles, this must be indicated in the course description (see Section II B and Appendix II).

Written English and Mathematics Requirements, Recommended Introductory Course List for U1: Indicate where the course is intended to satisfy the Written English (W) or the Mathematics (M) requirement or is to be included on the Recommended Introductory Course (RIC) List (formerly the U1 course list). (Attach Request for Statement of Support Form(s) and responses received. See Section VI Completing the Form Request for Statement of Support.)

SECTION F – RESULTING CHANGES TO COURSES / PROGRAMS
Indicate whether the course introduction will lead to course / program modifications in:

(i) your academic unit (i.e. department, faculty, college or school), for example, because it will replace a current required or elective course, or because it is a new required or elective course; and/or

(ii) any other academic unit.

If the course introduction leads to a program modification(s) in your unit, a Program Modification Form(s) must be included in your faculty/college/school submission to SCCC (see Section V Completing the Program Modification Form). The completed form must include a brief description of the program modification(s), in prose, and be submitted together with revised program charts, lists of electives, or any other changes to Calendar content that follow from the course introduction and program modification(s).

If the course introduction leads to changes to a program(s) in another academic unit(s), list the program(s) affected and attach a Request for Statement of Support Form(s) and any responses received. See Section VI Completing the Form Request for Statement of Support.

Proposals for course introductions that would impact programs in other units, should, ideally, be brought forward for the Fall deadline for SCCC or SPPC, as appropriate. Academic units initiating such changes are required to advise other affected units of the proposed change(s), including an indication of the term the change would take effect, so other units have an opportunity to submit corresponding changes to the SCCC for the same Fall deadline, ideally, or the next ensuing Spring deadline. Please refer to the most recent Academic Calendar to identify impacted courses and programs. You can do this by completing a keyword search of the PDF version of the Calendar that is available online (http://umanitoba.ca/calendar). The Registrar’s Office (Calendar Coordinator; http://intranet.umanitoba.ca/student/records/contact.html) can assist units in identifying other courses/programs affected by a proposed course introduction where an academic unit does not have this information. Please make an effort to identify impacted courses and programs before requesting RO’s assistance.

SECTION G – STATEMENT OF CHANGES TO COSTS, WORKLOAD, AND/OR SUPPLIES
Provide a statement of changes to costs if there is a change in any of the following:

(i) workload of academic or support staff or reassignment of workload from one faculty/school to another;

(ii) requirements for additional space, renovations to existing space or changes in the usage of space;

(iii) costs of supplies and expenses including any specific media/technology requirements associated with the teaching of the course.
SECTION H – PREQUISITE, COREQUISITE, PRE- OR CO-REQUISITE, & MUTUALLY EXCLUSIVE COURSES

In the spaces provided on the form, list all prerequisite, co-requisite, pre- or corequisite, and mutually exclusive courses, including all applicable previous courses numbers (including both Aurora and IMS course numbers). Where it is necessary to list a number of courses, be explicit by using “and” and “or” statements and make use of [square brackets] to separate lists where these would provide clarity. See examples provided in Appendix II. Indicate as a letter grade where a minimum grade for a prerequisite course, examination, or equivalency test is required.

Use of terms:

- **Prerequisite course** – a course that must be taken before the proposed course. A minimum grade of “C” is assumed. A different minimum grade must be stated.
- **Pre- or Corequisite course** – where concurrency in the prerequisite course is allowed
- **Corequisite course** – a course that must be taken at the same time as the proposed course (cannot be a spanned course)
- **Equivalent course** – a course that could be used in place of the proposed course, based on equivalent course content, and has an equal number of credit hours
- **Mutually exclusive course** – a course that is not to be held with the proposed course on the basis of overlapping course content
- **Spanned course** – a course that spans the Fall and Winter Terms

SECTION I – SUPPORTING DOCUMENTATION ATTACHED

Use the drop-down lists to indicate which supporting documents are attached to the course introduction form or included with the faculty/college/school submission to SCCCC as part of a proposed Program Modification.

A course outline is required for most course introductions. Exceptions are sometimes allowed where the course introduction represents an existing course that is being reintroduced, for example, with a different course number or course short course title.

Course outlines are provided to the SCCCC for information on the manner in which the course content set out in the course description will be delivered and evaluated. The committee recognizes that course outlines may be subject to future changes by the instructor and/or the department/faculty/college/school. See Section VII Other Supporting Documentation for information on content to be provided in the course outline for the SCCCC.

A Library statement is normally required for a course introduction, including topics courses. A library statement may not be required for the following types of courses: studio, ensemble, clinical and other practicums, co-operative, field work, and work terms. See Section VII Other Supporting Documentation for additional information on Library statements.

SECTION J - SIGNATURES

Print or type names and sign in the spaces provided. The Head should sign for the department and the Dean/Director for the faculty/college/school. In cases where there is more than one faculty/college/school involved, the form should be co-signed by the Deans/Directors of the faculties/colleges/schools involved, or a supporting statement should be provided.
III. COMPLETING THE UNDERGRADUATE COURSE MODIFICATION FORM

- The course modification form must be completed for all courses being modified.

- Course modifications include, but are not necessarily limited to, changes to the following: long course title; course description; prerequisite, corequisite, pre- or corequisite, and/or mutually exclusive courses; grading mode; registration restrictions; suitability for the written English (W) or mathematics (M) requirement, or for inclusion on the Recommended Introductory Course (RIC) List course list.

- If the short course title, the course number, or the number of credit hours is to be changed do not use this form. The current course MUST be deleted and introduced under the new title and/or number.

SECTION A – COURSE DETAILS

- Use the drop-down lists to indicate the Faculty/College/School and Department (or program where there is no department; e.g. Canadian Studies, Environmental Design) proposing the course modification. NB In the Senate curriculum process, the Université de Saint-Boniface is considered a faculty.

- Provide the Current Long Title (maximum 90 characters) in the space provided - e.g. History of Opera I: From Monteverdi to Mozart.

- Provide the Revised Long Title (maximum 90 characters) in the space provided where the long course title is to be modified.

- Indicate the Current credit hours in the space provided.

- Revised grading mode – Use the drop-down list to indicate whether the grading mode for the course will be changed from a standard letter grade to pass/fail or vice versa. The course description must indicate where the grading mode is “pass fail”.

- Changes Take Effect – Use the drop-down list to select the next ensuing Fall Term and Year (normally) or to request a different term. Exceptions may apply for courses to take effect in the next ensuing Summer Term. Requests for exceptions may be noted manually on the form.

SECTION B – MODIFIED COURSE DESCRIPTION

Provide a modified course description exactly as it would appear in the Academic Calendar. Forms will be returned to the proposing faculty/college/school for amendment where course descriptions are incomplete. See Section II B for information on the format of, and information to be included in, the course description. See Appendix II for examples.

SECTION C – CURRENT COURSE DESCRIPTION

Provide the current course description exactly as it appears in the current Academic Calendar.

SECTION D – RATIONALE FOR COURSE MODIFICATION

Provide a brief rationale for the course modification, including a brief explanation of how it might enhance or otherwise impact an existing or proposed curriculum. Reasons for modifying a course might include but are not limited to: updating material in keeping with advances and/or changes in the foci of a particular discipline or department; responding to recommendations in a program review; responding to program modifications.
• **SECTION E – DETAILS OF PROPOSED MODIFICATIONS**

- **Adding registration restriction** – Indicate where a restriction is to be added, to restrict registration to students in a particular faculty/college/school or academic program(s), including level or year of study. List the faculty/college/school and/or programs(s) in the spaces provided. *Indicate registration restrictions in the modified course description.* Contact the Registrar’s Office to discuss options for restricting registration.

- **Adding /Removing Laboratory / Field Trip Requirement** – Use the drop-down lists to indicate where a laboratory / field trip requirement is either to be added or deleted. *If a laboratory /field trip requirement is added, this must be indicated in the modified course description.*

- **Written English and Mathematics Requirements, Recommended Introductory Course List for U1:** Use the drop-down lists to indicate where a course has been modified to satisfy the Written English (W) or the Mathematics (M) requirement or is to be included on the Recommended Introductory Course List (RIC List, formerly the U1 course list). (Attach Request for Statement of Support Form(s) and responses received. See Section VI Completing the Form - Request for Statement of Support.)

• **SECTION F – RESULTING CHANGES TO COURSES / PROGRAM(S)**

Indicate whether the course modification will lead to course/program changes in:

(i) your academic unit (i.e. department, faculty, college or school), for example, because it will replace a current required or elective course, or because it is a new required or elective course; and/or

(ii) any other academic unit.

List the course(s)/program(s) in your unit that are affected.

If the course modification leads to a program modification(s) in your unit, a Program Modification Form(s) must be included in your faculty/college/school submission to SCCCC. The completed form must include a brief description of the program modification(s), in prose, and must be submitted together with revised program charts, lists of electives, or any other changes to Calendar content that follow from the course and program modification.

If the course modification leads to changes to course/ program changes in another academic unit(s), list the courses/program(s) affected and attach a Request for Statement of Support Form(s) and any responses received. See Section VI Completing the Form - Request for Statement of Support.

Proposed course modifications (including changes to pre- or corequisites) that would impact other courses/programs, including courses/programs in other units, should, *ideally*, be brought forward for the Fall deadline for SCCCC or SPPC, as appropriate. Academic units initiating such changes are *required* to advise other affected units of the proposed change(s), including an indication of the term the change would take effect, so other units have an opportunity to submit corresponding changes to the SCCCC for the same Fall deadline, *ideally*, or the next ensuing Spring deadline. Please refer to the most recent Academic Calendar to identify impacted courses and programs. You can do this by completing a keyword search of the PDF version of the Calendar that is available online ([http://umanitoba.ca/calendar](http://umanitoba.ca/calendar)). The Registrar’s Office (Calendar Coordinator; [http://intranet.umanitoba.ca/student/records/contact.html](http://intranet.umanitoba.ca/student/records/contact.html)) can assist units in identifying other courses/programs affected by a proposed course introduction where an academic unit does not have this information. Please make an effort to identify impacted courses and programs before requesting RO’s assistance.
SECTION G – STATEMENT OF CHANGES TO COSTS, WORKLOAD, AND/OR SUPPLIES

Provide a statement of changes to costs if there is a change in any of the following:

- Workload of academic or support staff or reassignment of workload from one faculty/school to another.
- Requirements for additional space, renovations to existing space or changes in the usage of space.
- Costs of supplies and expenses including any specific media/technology requirements associated with the teaching of the course.

SECTION H – MODIFICATIONS TO PREREQUISITE, COREQUISITE, PRE- OR COREQUISITE, & MUTUALLY EXCLUSIVE COURSES

- In the spaces provided on the form, list all prerequisite, corequisite, pre- or corequisite, and mutually exclusive courses, including all applicable previous courses numbers (including both Aurora and IMS course numbers). See page 5 for definitions.
- Indicate as a letter grade where a minimum grade for a prerequisite course, examination, or equivalency test is required. A minimum grade of “C” is assumed. A different minimum grade must be stated.
- Where it is necessary to list a number of courses, be explicit by using “and” and “or” statements and make use of [square brackets] to separate lists where these would provide clarity. See examples provided in Appendix II.

SECTION I – SUPPORTING DOCUMENTATION ATTACHED

Use the drop-down lists to indicate which supporting documents are attached to the course modification form or included with the faculty/college/school submission to SCCCC as part of a proposed Program Modification.

SECTION J - SIGNATURES

Print or type names in the spaces provided and sign. The Head should sign for the department and the Dean/Director for the faculty/college/school. In cases where there is more than one faculty/school involved, the form should be co-signed by the Deans/Directors of the faculties/colleges/schools involved, or a supporting statement should be provided.
IV. COMPLETING THE UNDERGRADUATE COURSE DELETION FORM

- Use the course deletion form where:
  (i) a course is to be deleted
  (ii) a course is renumbered
  (iii) the credit hours are modified
  (iv) the short course title is to be modified
  (v) the grading mode is changed

- To change the short course title, a course number, the number of credit hours, or the grading mode, the current course must be deleted and re-introduced under a new short title and/or course number, as appropriate. See Section II Completing the Undergraduate Course Introduction Form.

- It is not necessary to complete a separate form for each course. Three (3) course deletions can be proposed on a single form. Please complete additional forms, as required, where more than three courses are to be deleted.

SECTION A

- Use the drop-down lists to indicate the Faculty/College/School and Department (or program where there is no department; e.g. Canadian Studies, Environmental Design) proposing the course deletion. NB In the Senate curriculum process, the Université de Saint-Boniface is considered a faculty.

SECTION B – COURSES TO BE DELETED

- Provide the Subject code and Course Number and the number of Credit Hours in the spaces provided.

- Last term offered – Use the drop-down list to select the current Winter Term and Year (normally) or to request a different term. Courses offered for the last time in a Winter Term would not be available beginning with the next ensuing Summer Term. Requests for exceptions may be noted manually on the form.

- Use the drop-down list to indicate whether the course deletion will lead to (i) course/program changes in your academic unit (i.e. department/faculty/college/school) and/or (ii) course/program changes in another faculty/college/school/department.

- List the course(s)/program(s) affected, separated by a semicolon, in the space provided. List the course(s)/program(s) in your unit that are affected.

If the course deletion leads to a program modification(s) in your unit, a Program Modification Form(s) must be included in your faculty/college/school submission to SCCC. The completed form must include a brief description of the program modification(s), in prose, and must be submitted together with revised program charts, lists of electives, or any other changes to Calendar content that follow from the deletion and program modification.

If the course deletion leads to a course/program modification(s) in another academic unit(s), list the course(s)/program(s) affected and attach a Request for Statement of Support Form(s) and any responses received. See Section VI Completing the Form - Request for Statement of Support.

Proposals for course deletions (including changes to pre- or corequisites) that would impact other courses/programs, including courses/programs in other units, should, ideally, be brought forward for the Fall deadline for SCCC or SPPC, as appropriate. Academic units initiating such changes
are required to advise other affected units of the proposed change(s), including an indication of the term the change would take effect, so other units have an opportunity to submit corresponding changes to the SCCCC for the same Fall deadline, ideally, or the next ensuing Spring deadline. Please refer to the most recent Academic Calendar to identify impacted courses and programs. You can do this by completing a keyword search of the PDF version of the Calendar that is available online (http://umanitoba.ca/calendar). The Registrar’s Office (Calendar Coordinator; http://intranet.umanitoba.ca/student/records/contact.html) can assist units in identifying other courses/programs affected by a proposed course introduction where an academic unit does not have this information. Please make an effort to identify impacted courses and programs before requesting RO’s assistance.

- **SECTION C – SUPPORTING DOCUMENTATION ATTACHED**
  Use the drop-down lists to indicate which supporting documents are attached to the course deletion form or included with the faculty/college/school submission to SCCCC as part of a proposed Program Modification.

- **SECTION D - SIGNATURES**
  Print or type names and sign in the spaces provided. The Head should sign for the department and the Dean/Director for the faculty/college/school. In cases where there is more than one faculty/school involved, the form should be co-signed by the Deans/Directors of the faculties/schools involved, or a supporting statement should be provided.
V. COMPLETING THE UNDERGRADUATE PROGRAM MODIFICATION FORM

- A program modification form must be completed where course or curriculum changes proposed by your unit or by another faculty/college/school lead to a program modification(s) in your unit, including but not limited to, changes to lists of required or elective courses in a program(s).

- A program modification form is also required where a unit proposes program modifications that do not necessarily arise from course introductions/modifications/deletions. For example, where a program is restructured or the credit hour system is revised, resulting in changes to credit hours for a large number of courses.

- A change to the name of a program constitutes a program modification.

NB: Information on the approval process for major amendments to, or major expansion of, an existing program is available on the webpage of the Vice-President (Academic) and Provost at http://umanitoba.ca/admin/vp_academic/academic_programs/3722.html. Information on additional documentation required for proposals for major amendments to, or major expansion of, an existing program can be found on page 2 of these Guidelines.

Faculties, colleges, and schools are strongly encouraged to consult with the Vice-Provost (Integrated Planning and Academic Programs), the Academic Specialist (Office of the University Secretary), and the University Budget Officer, as appropriate, at the outset of planning for substantial revisions to an existing program.

- SECTION A – FACULTY/COLLEGE/SCHOOL AND DEPARTMENT
  - Use the drop-down lists to indicate the Faculty/College/School and Department (or program where there is no department; e.g. Canadian Studies, Environmental Design) proposing the course introduction. NB In the Senate curriculum process, the Université de Saint-Boniface is considered a faculty.
  - Provide the name of the program in the space provided. Please be specific [e.g. B.Sc. in Agriculture; B.Sc. in Engineering (Civil); B.Sc. (Hons.) in Physics and Astronomy – Astronomy (Option A)]
  - Changes Take Effect – Use the drop-down list to select the next ensuing Fall Term and Year (normally) or to request a different term. Requests for exceptions may be noted manually on the form.

- SECTION B – DESCRIPTION OF PROGRAM MODIFICATION
  Provide a brief description of the proposed program modification, in prose, for the program(s) in your faculty/college/school. Include the same description on the summary sheet to be included at the beginning of the submission to SCCC. (Limit – 200 words)

  Where significant changes to a program are proposed, describe what arrangements will be made for the students affected by the transition to a new program structure.

- SECTION C – RATIONALE
  Provide a brief rationale for the proposed program modification. (Limit- 150 words)
• SECTION D – ACADEMIC CALENDAR CONTENT

Attach a description of the program modification as it would appear in the current Academic Calendar, including any program charts, in particular. Beginning with the program description as it appears in the current Academic Calendar, clearly indicate proposed changes using strikethrough font (e.g. strikethrough) to indicate content that is to be deleted and bold font to indicate content that is to be added. See Appendix III for examples.

• SECTION E – STATEMENT OF CHANGES TO COSTS, WORKLOAD, AND/OR SUPPLIES

Provide a statement of changes to costs if there is a change in any of the following:

• Workload of academic or support staff or reassignment of workload from one faculty/school to another.
• Requirements for additional space, renovations to existing space or changes in the usage of space.
• Costs of supplies and expenses including any specific media/technology requirements associated with the teaching of the course.

The SPPC Program Proposal Budget Form must be completed if the proposed changes involve a request for new resources. (http://umanitoba.ca/admin/governance/forms/index.html)

• SECTION F – CONSULTATION WITH OTHER UNITS THAT MIGHT BE AFFECTED BY CHANGES

Indicate whether the proposed program modification leads to program modifications in another academic unit(s). List the program(s) affected and attach a Request for Statement of Support Form(s). See Section VI Completing the Form - Request for Statement of Support.

Proposals for program modifications that would impact other programs, including courses/programs in other units, should, Ideally, be brought forward for the Fall deadline for SCCCC or SPPC, as appropriate. Academic units initiating such changes are required to advise other affected units of the proposed change(s), including an indication of the term the change would take effect, so other units have an opportunity to submit corresponding changes to the SCCCC for the same Fall deadline, Ideally, or the next ensuing Spring deadline. Please refer to the most recent Academic Calendar to identify impacted courses and programs. You can do this by completing a keyword search of the PDF version of the Calendar that is available online (http://umanitoba.ca/calendar). The Registrar’s Office (Calendar Coordinator; http://intranet.umanitoba.ca/student/records/contact.html) can assist units in identifying other courses/programs affected by a proposed course introduction where an academic unit does not have this information. Please make an effort to identify impacted courses and programs before requesting RO’s assistance.

• SECTION G – SUPPORTING DOCUMENTATION ATTACHED

Use the drop-down lists to indicate which supporting documents are attached to the Program Modification Form.

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SECTION H – SIGNATURES
Print or type names and sign in the spaces provided. The Head should sign for the department and the Dean/Director for the faculty/college/school. In cases where there is more than one faculty/college/school involved, the form should be co-signed by the Deans/Directors of the faculties/colleges/schools involved, or a supporting statement should be provided.
VI. COMPLETING THE FORM - REQUEST FOR STATEMENT OF SUPPORT

A written statement of support from other departments/faculties/colleges/schools is required for curriculum or course changes (including program proposals) where:

- there is possible curricular overlap or infringement or conflict of jurisdiction;
- a course(s)/program(s) in another unit(s) would be affected by a proposed curriculum or course change in your unit;
- there is a request for assessment of a course that is intended to satisfy either the written English (W) requirement or the mathematics (M) requirement (See Section VII Other Supporting Documentation);
- there is a request for a new or modified course to be assessed for inclusion on the Recommended Introductory Course (RIC) List (See Section VII Other Supporting Documentation).

Part A (Sections A through D) and Part B (Section F) of the form are to be completed by the unit requesting a statement(s) of support. A copy of the form, with these sections completed, is to be provided to each unit(s) from which a statement of support is sought, along with any supporting documentation that might be required.

One copy of the completed form (Part A – Sections A through D) plus any statements of support received from the other units (Part B – Sections F through J) are to be submitted with your faculty/college/school’s submission to SCCCC.

SECTION A

- Use the drop-down lists to indicate the Faculty/College/School and Department (or program where there is no department; e.g. Canadian Studies, Environmental Design) proposing the course modification. NB In the Senate curriculum process, the Université de Saint-Boniface is considered a faculty.

SECTION B – NATURE OF REQUEST FOR SUPPORT

Check the appropriate box to indicate whether the request for a statement of support relates to:

- possible curricular overlap or infringement or conflict of jurisdiction;
- possible course/program changes in another unit(s) arising from proposed course/program changes in your unit;
- a request for assessment of a course intended to satisfy the W requirement, the M requirement, inclusion on the RIC list (see below).

Specify the date by which your unit requires a response from the other unit(s). Units requesting a statement of support should allow a minimum of four (4) weeks for the other unit(s) to respond. The absence of a response should not be understood to be an indication of support.

Written English (W) and mathematics (M) requirements: Proposals for new and modified courses intended to satisfy the written English (W) or the mathematics (M) requirement must be reviewed and accepted by the review committee within the Department of English, Film, and Theatre or the Department of Mathematics, as appropriate. The review must be completed prior to submitting the course introduction/modification to the SCCCC. Submissions to the appropriate departmental review committee must include the course introduction/modification form and two-page course outline and should be sent to the attention of the appropriate Department Head.
The criteria for identification of courses as satisfying the University written English and mathematics requirement are available at http://umanitoba.ca/faculties/arts/media/Criteria_for_English-Math.pdf.

Recommended Introductory Course (RIC) List: New and modified 1000 level courses and 2000 level courses without prerequisites that are to be included on the RIC List must be reviewed and accepted, for inclusion on the list, by the Executive Director, Student Academic Success. The review must be completed prior to submitting the course introduction/modification to the SCCCC. Submissions must include the course introduction/modification form and two-page (maximum) course outline and should be sent to the Executive Director, Student Academic Success, who will review requests on an ongoing basis.

Faculties/colleges/schools are also required to notify the Executive Director, Student Academic Success and the SCCCC when a course is to be removed from the RIC List. Such notification can be provided on the course modification/deletion form, as appropriate.

- **SECTION C – DESCRIPTION OF PROPOSED CURRICULUM/COURSE CHANGE**
  Briefly describe the proposed curriculum or course change in your unit and outline the reasons for your request for support in the space provided. Attach any supporting documentation that might be required to describe the proposed changes.

- **SECTION D – UNIT(S) RECEIVING REQUEST FOR STATEMENT OF SUPPORT**
  List all of the faculties/colleges/schools/departments solicited for a statement of support in the space provided.

- **SECTION E – STATEMENT(S) OF SUPPORT RECEIVED**
  One copy of the Statement of Support: Part A – Request form is to be included in your unit’s submission to SCCCC, together with all of the responses received from other units (Statement of Support: Part B – Response).

- **SECTION F – UNIT REQUESTING SUPPORT**
  - To be completed by the unit requesting a statement of support.
  - Units asked to provide a statement of support should do so in a timely way, to facilitate the curriculum review processes within both units as well as the SCCCC review process.
  - Use the drop-down lists to indicate the Faculty/College/School and Department (or program) requesting the statement of support.

- **SECTION G – UNIT RESPONDING TO REQUEST**
  - To be completed by the unit responding to a request for a statement of support.
  - Use the drop-down lists to indicate the Faculty/College/School/University 1 and Department (or program) responding to the request for a statement of support.
SECTION H – RESPONSE TO REQUEST
• To be completed by the unit responding to a request for a statement of support.
• In the space provided, indicate whether your unit can/cannot provide a statement of support and briefly outline the rationale, if appropriate.

SECTION I – IMPACT ON COURSE(S)/PROGRAM(S) IN UNIT RESPONDING AND NEXT STEPS
• To be completed by the unit responding to a request for a statement of support.
• List the course(s)/program(s) in your unit that would be impacted by the curriculum/course change being proposed.
• Indicate the course/curriculum changes that your unit would be required to make, as a result, and when your unit will submit those course/curriculum changes to the SCCCC for Senate approval (e.g. Fall 2015 or Spring 2016). Normally, this would be the next ensuing Fall or Spring submission deadline, as specified in the SCCCC Timetable for Submissions (http://umanitoba.ca/admin/governance/meetings/index.html).

SECTION J – SIGNATURES
Print or type names and sign in the spaces provided. The Head should sign for the department and the Dean/Director for the faculty/college/school. In cases where there is more than one faculty/college/school involved, the form should be co-signed by the Deans/Directors of the faculties/colleges/schools involved, or a supporting statement should be provided.
VII. OTHER SUPPORTING DOCUMENTATION

1. Course outline – required for all course introductions
   
   A two (2) page (maximum) outline including:
   
   - the course name, subject code, and course number
   - a statement of course objectives
   - a statement of course format, including lecture, laboratory, and tutorial hours per week
   - a list of topics to be covered in lectures
   - a statement on grading and evaluation, including information on the grading scheme, and a brief description of laboratories, tutorials, and assignments, including the weightings of the various types of assessments
   - required textbook(s)/readings, if applicable

   Course outlines are provided to SCCCC for information, to provide additional information on the manner in which the course content set out in the course description will be delivered and evaluated. The committee recognizes that course outlines will be subject to future changes by the instructor and the department/faculty/school.

2. Library statement: A statement from the subject librarian must accompany all proposals for new courses. The Library must be provided with a course outline as described above. As well, the proposing unit and the subject librarian should discuss and agree upon the bibliography to be used in assessing the strength of the Library’s collection in the field. In the case of topics courses, departments are not required to provide the Library with a detailed bibliography but must provide a summary of the topics that might be covered in the course. The Library will need at least one month’s notice of course proposals in order to prepare the statement. Additional time will be required for program proposals.

   A library statement may not be required for the following types of courses: studio, ensemble, practicums, co-operative, field work, and work terms. A library statement is required for topics courses. Please consult with the Library to confirm whether or not a library statement is required.
SUMMARY SHEET: EXAMPLES

Faculty of Environment, Earth, and Resources

Geological Sciences

Introductions:
GEOL 4380 Mineral Resource Development Cr.Hrs. 3 +3.0

NET CHANGE IN CREDIT HOURS: +3.0

Program modifications:
The Department is proposing that the Geological Sciences – Geology Electives List B and the Geological Sciences – Geophysics Electives List B be modified to include GEOL 4380.

Faculty of Music

Deletions:
MUSC 1070 Introduction to the History of Music Cr.Hrs. 3 -3.0
MUSC 1080 History of Music 2 Cr.Hrs. 3 -3.0

Introductions:
MUSC 1004 Introduction to Music in History 1 Cr.Hrs. 3 +3.0
MUSC 3054 Medieval and Renaissance Music History Cr.Hrs. 3 +3.0
MUSC 3064 Baroque Music History Cr.Hrs. 3 +3.0

Modifications:
MUSC 1190 Ensemble Cr.Hrs. 2 0.0
MUSC 2400 Major Practical Study Cr.Hrs. 6 0.0
MUSC 3090 Introduction to Ethnomusicology Cr.Hrs. 3 0.0

NET CHANGE IN CREDIT HOURS: +3.0

Program modifications:
The faculty is proposing program modifications to the Bachelor of Music, including the General, Performance, Composition, and History concentrations, the Bachelor of Music / Bachelor of Education (Integrated Music Education Program), and the Bachelor of Jazz Studies program in order to: establish a common first year for all students; introduce greater flexibility; clarify curricular structures; eliminate redundancies and gaps; improve balance between academic and performance-based student activities.
FORMAT FOR COURSE DESCRIPTIONS:

Examples of laboratory requirement:

MATH 2130 Engineering Mathematical Analysis 1 Cr.Hrs. 3
(Lab required) Multivariable differential and integral calculus up to and including multiple integrals in cylindrical and spherical coordinates. For Engineering and Geophysics students only. May not be held with MATH 2720, MATH 2750, or the former MATH 2110. Prerequisites: MATH 1210 or MATH 1211, and MATH 1710 (C).

POLS 1010 Political Ideas and Ideologies Cr.Hrs. 3
(Lab required) An introduction to different philosophical systems of political beliefs and values that structure contemporary political discourse and practise.

Examples of field trip requirement:

BIOL 4390 Principles of Wildlife Management Cr.Hrs. 3
(Lab Required) Introduction to the biological and socioeconomic goals of wildlife management and to the basic techniques of wildlife management in terms of these goals. There will be four or five field trips. Some weekend field trips may be required. Prerequisite: BIOL 3310 (ZOOL 3680) (C); or consent of department.

NATV 3100 Aboriginal Healing Ways Cr.Hrs. 3
This course allows students to work with Aboriginal elders or traditional teachers on concepts of healing and wellness. Emphasis is on Anishinabe or Cree healing practices, though other First Nations approaches may be offered. This course may include a field trip component. Students may not hold credit for both NATV 3100 and NATV 3000 when titled “Exploring Aboriginal Healing.” Prerequisite: [a grade of “C” or better in NATV 2100] or written consent of the department head.

Examples of prerequisites and pre-or corequisites, including where there is a minimum grade requirement:

GEOL 4380 Mineral Resource Development Cr.Hrs.3
Examination of economic, political, social, and environmental considerations that affect exploration and mining activity. Prerequisite: GEOL 3130 (C+). Pre- or co-requisite: GEOL 4300.

MATH 2130 Engineering Mathematical Analysis 1 Cr.Hrs. 3
(Lab required) Multivariable differential and integral calculus up to and including multiple integrals in cylindrical and spherical coordinates. For Engineering and Geophysics students only. May not be held with MATH 2720, MATH 2750, or the former MATH 2110. Prerequisites: MATH 1210 or MATH 1211, and MATH 1710 (C).

ABIZ 2390 Introduction to Environmental Economics Cr.Hrs. 3
The economics of management of water, air and land resource quality, and the economics of conservation. The economic implications of environmental standards, licensing, criteria and pollution charges will be illustrated by current issues. Students may not hold credit for both ABIZ 2390 and ECON 2390. Prerequisite: [A grade of "C" or better in ECON 1010 or ECON 1011 or the former ECON 1200 or the former ECON 1201] or [a grade of "C" or better in both ECON 1210 (or ECON 1211) and ECON 1220 (or ECON 1221)].

Examples of mutually exclusive course:

MATH 2130 Engineering Mathematical Analysis 1 Cr.Hrs. 3
(Lab required) Multivariable differential and integral calculus up to and including multiple integrals in cylindrical and spherical coordinates. For Engineering and Geophysics students only. May not be held with MATH 2720, MATH 2750, or the former MATH 2110. Prerequisites: MATH 1210 or MATH 1211, and MATH 1710 (C).

PDSD 3412 Pediatric Dentistry 2 Cr.Hrs. 3
A series of seminars and clinics to give the student a basic understanding and some clinical experience with: clinical procedures, emergency treatment, psychological management, preventive medical considerations and the provision of total dental care to pediatric patients. May not be held with PDSD 3050.
Example of topics course:
SOC 4530 Readings in Sociology Cr.Hrs. 3
A reading course for undergraduates and pre-Master's in sociology. Prerequisite: written consent of department head. As the course content will vary from term to term, students may take this course more than once for credit.

Example of pass/fail grading mode:
NURS 3320 Clinical Nursing Practice 4 Cr.Hrs. 3
Students will apply concepts of health maintenance to clients of all ages with long term illness. The course focuses on chronic illness and related phenomena, analytical thinking, development of nursing roles, application of research findings and membership on an interdisciplinary team. Pre- or corequisite: NURS 3280, NURS 3310. Course evaluated on a pass/fail basis.

Example of registration restriction:
MECH 4162 Thesis Cr.Hrs. 6
The course will give students the opportunity to gain a research or design experience in their area of interest. Thesis topics must be approved by the head of the department or designate. This course is restricted to students in Year 4 Mechanical Engineering. Prerequisites: ENG 2010 and eligible to graduate. Not to be held for credit with MECH 4160.
EXAMPLES OF DESCRIPTIONS OF PROGRAM MODIFICATIONS:

Revisions to B.Sc. Honours in Actuarial Mathematics

<table>
<thead>
<tr>
<th>YEAR 1</th>
<th>YEAR 2</th>
<th>YEAR 3</th>
<th>YEAR 4</th>
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<tbody>
<tr>
<td>**HONOURS ACTUARIAL</td>
<td>120 CREDIT HOURS**</td>
<td>**HONOURS ACTUARIAL</td>
<td>120 CREDIT HOURS**</td>
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<td>ECON 1010, ECON 1020</td>
<td>ACT 2020, ACT 2120, ACT 2210</td>
<td>ACT 3130, ACT 3230, ACT 3630, ACT 3340, ACT 4140, ACT 4630</td>
<td>ACT 4060, ACT 4340, ACT 4630</td>
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<td>MATH 1500, MATH 1700, MATH 1300</td>
<td>STAT 2400, STAT 3400</td>
<td>GMGT 2010</td>
<td>STAT 3470, STAT 3490</td>
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<td>STAT 1000, STAT 2000</td>
<td>ACC 1100, FIN 2200</td>
<td>STAT 3050, STAT 3800</td>
<td>MSCI 2150</td>
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<td>3 credit hour “W” requirement</td>
<td>MATH 2720, MATH 2730</td>
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<td>6 credit hours of electives</td>
<td>MATH 2300</td>
<td>12 credit hours of approved electives</td>
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<td>30 Hours</td>
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Revisions to Minor (Concentration) in Latin American Studies

A Minor (Concentration) in Latin American Studies consists of at least 18 credit hours from a minimum of two different departments chosen from the following list.

**Anthropology**
- ANTH 2690 Peoples and Cultures of Contemporary Latin America 3
- ANTH 2990 Prehispanic Cultures of Mexico 3

**Economics**
- ECON 3390 Development Economics 6
- ECON 3392 An Introduction to Development Economics 3
- ECON 3394 Development Economics: Problems and Policies 3

**History**
- HIST 2140 Colonial Latin America (A) 3
- HIST 2150 Independent Latin America (A) 3
- HIST 3020 South America Since 1945 (A) 3

**Spanish**
- SPAN 2200 Spanish American Culture and Civilization 3
- **SPAN 2210 Voices and Images of Latin America** 3
- SPAN 2540 Spanish-American Literature 2 3
- **SPAN 3080 Contemporary Latin American Novel** 3
## Electrical Engineering Courses Requirements

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ANTH 2430</td>
<td>Ecology, Technology and Society</td>
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<tr>
<td>CHEM 1300</td>
<td>Structure and Modelling of Chemistry</td>
<td>3</td>
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<tr>
<td>CIVL 4050</td>
<td>Engineering Economics</td>
<td>3</td>
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<tr>
<td>COMP 1012</td>
<td>Computer Programming for Scientists and Engineers</td>
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<tr>
<td>ENG 1430</td>
<td>Design in Engineering</td>
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<tr>
<td>ENG 1440</td>
<td>Introduction to Statics</td>
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<tr>
<td>ENG 1450</td>
<td>Introduction to Electrical and Computer Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ENG 1460</td>
<td>Introduction to Thermal Sciences</td>
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<tr>
<td>ENG 2010</td>
<td>Technical Communications</td>
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<tr>
<td>ENG 2030</td>
<td>Engineering Communication: Strategies for the Profession</td>
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<tr>
<td>or ENG 2040</td>
<td>Engineering Communication: Strategies, Practice, and Design</td>
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<tr>
<td>ENGL 1400</td>
<td>Thematic Approaches to the Study of Literature (or equivalent)</td>
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<tr>
<td>MATH 1210</td>
<td>Techniques of Classical and Linear Algebra</td>
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<tr>
<td>MATH 1510</td>
<td>Applied Calculus 1 (or equivalent)</td>
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<tr>
<td>MATH 1710</td>
<td>Applied Calculus 2 (or equivalent)</td>
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<tr>
<td>MATH 2130</td>
<td>Engineering Mathematical Analysis</td>
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<td>MATH 2132</td>
<td>Engineering Mathematical Analysis 2</td>
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<td>MATH 3132</td>
<td>Engineering Mathematical Analysis 3</td>
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<tr>
<td>PHIL 1290</td>
<td>Critical Thinking**</td>
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<td>PHYS 1050</td>
<td>Physics 1: Mechanics</td>
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<td>PHYS 2152</td>
<td>Modern Physics for Engineers</td>
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<td>STAT 2220</td>
<td>Introduction to Probability and Statistics</td>
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<td>ECE 2160</td>
<td>Electronics 2E</td>
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<td>ECE 2220</td>
<td>Digital Logic Systems</td>
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<td>ECE 2240</td>
<td>Numerical Methods for Electrical Engineers</td>
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<td>ECE 2262</td>
<td>Electric Circuits</td>
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<td>ECE 3540</td>
<td>Advanced Circuit Analysis and Design</td>
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<tr>
<td>ECE 3580</td>
<td>Foundations of Electromagnetics</td>
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<td>ECE 3590</td>
<td>Electromagnetic Theory</td>
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<td>ECE 3600</td>
<td>Physical Electronics</td>
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<td>ECE 3610</td>
<td>Microprocessor Systems</td>
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<td>ECE 3670</td>
<td>Electronics 3E</td>
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<td>ECE 3720</td>
<td>Electric Power and Machines</td>
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<tr>
<td>ECE 3730</td>
<td>Principles of Embedded Systems Design</td>
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<tr>
<td>ECE 3780</td>
<td>Signal Processing 1</td>
<td>4</td>
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<td>ECE 4150</td>
<td>Control Systems</td>
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<td>ECE 4260</td>
<td>Communication Systems</td>
<td>4</td>
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<tr>
<td>ECE 4600</td>
<td>Group Design Project</td>
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</table>

Plus 1 Complementary Studies Elective,
Plus 1 Natural Science from the approved list of electives.
Plus 7 Technical Electives from the approved list.

** PHIL 1290 Critical Thinking is the recommended complementary studies elective. However, students may select any course from the Faculty of Arts or the Faculty of Management at the 1000 level or above, with the exception of ARTS 1110 Introduction to the University which may not be held for credit within the Faculty of Engineering.
Electrical Engineering: Standard Program Electrical Electives

Program Requirements:
In the standard Electrical Engineering program, seven Technical Elective Courses are required. At least 4 must be taken from the Group A list shown below. The remainder can be either from the below Group A or B lists.

GROUP A TECHNICAL ELECTIVE COURSES: (4 required)
- ECE 3650 Electric Machines
- ECE 4100 Microelectronic Fabrication
- ECE 4140 Power Transmission Lines
- ECE 4180 Control Engineering
- ECE 4200 Electric Filter Design
- ECE 4250 Digital Communications
- ECE 4270 Antennas
- ECE 4280 Engineering Electromagnetics
- ECE 4290 Microwave Engineering
- ECE 4300 Electrical Energy Systems 1
- ECE 4310 Electrical Energy Systems 2
- ECE 4360 High Voltage Engineering
- ECE 4370 Power Electronics
- ECE 4990 Engineering Computations 3E
- ECE 4420 Digital Control
- ECE 4580 Optoelectronics
- ECE 4610 Biomedical Engineering and Instrumentation
- ECE 4830 Signal Processing 2
- ECE 4860 Biomedical Optics
- ECE 4860 Design of RF Devices and Wireless Systems

GROUP B TECHNICAL ELECTIVE COURSES:
- ECE 3700 Telecom Networking
- ECE 3760 Digital System Design 1
- ECE 3770 Digital System Design 2
- ECE 4240 Microprocessor Interfacing
- ECE 4440 Computer Vision
- ECE 4520 Simulation & Modelling
- ECE 4530 Parallel Processing
- ECE 4540 Wireless Networks
- ECE 4740 Digital System Implementation
- ECE 4850 Performance Evaluation for Communications & Computer Eng.
- ECE 4860 Materials Characterization
- COMP 2140 Data Structures and Algorithms
- COMP 3190 Intro. Artificial Intelligence
- COMP 4180 Intelligent Mobile Robotics
- COMP 4390 Machine Learning
- MATH 3120 Applied Discrete Mathematics
- MATH 3700 Applied Complex Analysis
- MATH 3340 Complex Analysis 1
- MATH 3860 Partial Differential Equations 1
- MATH 3460 Partial Differential Equations
- PHYS 2280 Optics
- PHYS 3220 Medical Physics and Physiological Measurement
- PHYS 3640 Electro- and Magnetodynamics and Special Relativity
- PHYS 4590 Advanced Optics