# MEMORIAL UNIVERSITY OF NEWFOUNDLAND
# SENATE

The regular meeting of Senate was held on January 11 2022, at 4:00 p.m. via Webex

51.  **PRESENT**

The President, Dr. F. Strzelczyk, Dr. R. Shea, Dr. I. Sutherland, Dr. D. Hardy Cox, Dr. A. Warren, Dr. G. Watson, Dr. P. Banahene Adjei, Dr. D. Keeping, Dr. S. Bugden, Dr. K. Bulmer, Dr. A. Craig, Dr. A. Cunsolo, Dr. I. Dostaler, Dr. M Hunter, Dr. T. Fridgen, Dr. G. Galway, Dr. A. Gaudine, Dr. K. Jacobson, Dr. G. Naterer, Dr. M. Piercey-Normore, Ms. J. Porter, Ms. M. Snow, Dr. A. Sullivan, Dr. C. Andersen, Dr. K. Anderson, Dr. D. Behm, Dr. A. Bittner, Ms. L. Browne, Dr. N. Catto, Mr. C. Couturier, Dr. G. Cox, Dr. R. Croll, Mr. D. Duda, Mr. E. Durnford, Dr. J. Flynn, Dr. S. Ganz, Dr. G. George, Dr. E. Haven, Dr. J. Hawboldt, Dr. R. Haynes, Dr. K. Hodgkinson, Dr. P. Issahaku, Dr. E. Kendall, Dr. D. Kelly, Dr. C. Kozak, Dr. J. Lokash, Dr. S. MacDonald, Dr. D. O'Keefe, Dr. S. O'Neill, Dr. D. Peters, Dr. A. Pike, Dr. J. Pridham, Dr. C. Purchase, Ms. H. Skanes, Dr. K. Snelgrove, Dr. M. Stordy, Mr. P. Sullivan, Dr. L. Twells, Ms. C. Walsh, Dr. J. Westcott, Mr. A. Gharmartale, Mr. B. Mishkat, Ms. F. Ahmed, Mr. D. Dunphy, Ms. M. Feltham, Ms. H. Hennessey, Ms. S. Merchant, Mr. J. Mweemba, Ms. E. Redmond, Dr. M. Haghiri

**Chair of the Senate Committee on Undergraduate Studies (Standing Invitation)**

Dr. Shannon Sullivan

**WELCOME**

The President welcomed all Senators to the first meeting of Senate for 2022.

52.  **MOTION TO ADOPT AGENDA**

It was moved by Dr. Ian Sutherland, seconded by Dr. Dennis Peters and carried to adopt the agenda.

53.  **MINUTES**

It was moved by Dr. Peters, seconded by Mr. C. Couturier, and carried that the Minutes of the regular meeting held on December 13, 2021, were taken as read and confirmed.

54.    **Remarks from the Chair**

The President provided an update to Senate with regard to the following:

- The Memorial University Act
- New technology programs
- The conclusion of Ms. Iris Petten's term as Chair of Board of Regents and noted that the role will be temporarily filled by Ms. Cathy Duke, Vice-Chair of the Board of Regents.
- Town Hall scheduled for January 17, 2022

**Remarks from the Deputy Chair of Senate**

Dr. Strzelczyk provided an update on the following:

- Applications and recruitment: noted that applications are on par with last year, and thanked staff at the Registrar's Office who worked over holidays to ensure the processing of applications were assessed in a timely manner.
- Noted that Recruitment and Student Services were available to students over holidays
- An update on public health measures is anticipated from Government on January 17th regarding COVID. The University will issue statement on January 18th

**CONSENT AGENDA**

It was moved by Ms. J. Porter and seconded by Dr. S. Bugdan and carried that the Consent Agenda comprising items 55 through 56 be approved as follows:

Dr. M. Hunter abstained from the motion.

55.    REPORT OF THE SENATE COMMITTEE ON UNDERGRADAUTE STUDIES

55.1.   Department of Ocean Sciences

Page 496, 2021-2022 Calendar, under the heading 11.9.3.3 Program Regulations for the Major in Ocean Sciences (Environmental Systems), amend Clause 6. as follows:

"6. at least 9 credit hours at the 3000 and/or 4000 level chosen from:
a.  Geography 3120, 3140, 3250, 3425, 3510, 4050, 4060, 4190,4250, 4917; and
b.  Earth Sciences 3600, 4605, 4903. …"

## 55.2   Department of Archaeology

Page 266, 2021-2022 University Calendar under the heading 7.4.4 Regulations for the Diploma in Ancient Worlds delete and replace Table 1 as follows:

"Table 1 Approved Courses for the Diploma in Ancient Worlds

| | |
|---|---|
| Archaeology 1000 (or the former 1030), 2480, 2481, 2583 (or the former 3583), 3290, 3500, 3510, 3585-3586, 3687 | Philosophy 2201(or the former 2701), 3010 (or the former 3730), 3020 (or the former 3740) |
| Classics - any course | Religious Studies 1050, 1051, 1060, 1061, 2050, 2051, 2420, 3010, 3020, 3031, 3305, 3310, 3411, 3431, 3432, 3600 |
| History 2020 (or the former 2031), 2035, 2041, 2042, 3270 (same as Religious Studies 3270 and Medieval Studies 3270), (or the former 3930) | |

"

Page 278, 2021-2022 University Calendar under heading 8.9.4 Regulations for the Certificate in Indigenous Studies delete and replace Table 1 as follows:

"Table 1 Courses for the Certificate in Indigenous Studies

| 1000-level and 2000-level Courses | 3000-level and 4000-level Courses |
|---|---|
| <ul><li>Anthropology 2414</li><li>Archaeology 1005 or History 1005</li><li>Archaeology 2481, 2482</li><li>English 2160</li><li>History 2800</li><li>Linguistics 2022, 2025, 2026, 2060</li></ul> | <ul><li>Anthropology 3070, 3240</li><li>Archaeology 3290, 3291, 3510, 3588</li><li>Archaeology 3520 or History 3520</li><li>Archaeology 3525 or History 3525</li><li>Gender Studies 3015</li><li>History 3765, 4252</li><li>Law and Society 3012, 3014</li><li>Linguistics 3951</li><li>Political Science 3830</li><li>Sociology 4205</li></ul> |

"

## 55.3   Department of Religious Studies

Page 379, 2021-2022 University Calendar under section 16.26 Religious Studies, delete the following courses:

"RELS 2021 Apocalypse: The End Times in Thought, Action, and Imagination
RELS 3500 Philosophy of Religion "

Amend the course RELS 3540 to read as follows:

"RELS 3540 Christianity and Ritual Sacrifice introduces students to the thought of René Girard. Girard… social origins in sacrificial rites, examining the close relationship between violence and the sacred. The course considers applications of Girard's work to contemporary cultural dynamics, war, international affairs, and democratic processes."

<u>Department of Religious Studies (cont'd)</u>

Amend the course RELS 3860 to read as follows:

"RELS 3860 From Elvis to the Undertaker: Religion Outside the Box… explores the idea that religion, the sacred, and/or spirituality can manifest outside the confines of conventionally defined religious spaces. In particular, this course draws upon a variety of theoretical models to examine the idea that religion is found within popular culture, and within popular culture fan communities."

Amend the course RELS 4300 to read as follows:

"RELS 4300-4330 World Religions: Special Subjects

are courses which will be offered at the discretion of the Department on specialized topics in religious traditions, texts, and histories.

PR: permission of the Department"

Amend the course RELS 4801-4830 to read as follows:

"RELS 4801-4830 (Excluding 4812) Religion, Ethics, and Modern Culture: Special Subjects

are courses which will be offered at the discretion of the Department on specialized topics in religions and modern cultures.

PR: permission of the Department"

Page 332, 2021-2022 University Calendar, under section <u>15.17.4.1 Major in Religious Studies</u> delete and replace as follows:

**"15.17.4.1 Major in Religious Studies**

Students pursuing a major in Religious Studies are advised to choose their program in consultation with the Department. Students are required to take a minimum of 36 hours in Religious Studies, including:

1. At least 3 credit hours at the 1000 level;
2. At least 12 credit hours at the 2000 level;
3. At least 18 credit hours at the 3000 level or higher;
4. At least one of RELS 4001, 4002, or 4812;

A student pursuing a Major in Religious Studies is encouraged to successfully complete Language Study (LS) courses offered by the Department in order to fulfill the Bachelor of Arts Language Study (LS) Requirement and as preparation for advanced studies in Religious Studies".

55.4    Department of Classics

Page 292, 2021-2022 University Calendar under section 15.3.1 Department of Classics Description delete and replace as follows:

**"15.3.1 Department of Classics Description**

Classics explores the cultures and societies of ancient Greece and Rome within the broader context of the ancient Mediterranean. Such study is intrinsically multidisciplinary, encompassing Latin and ancient Greek texts, archaeology, intellectual history, material culture, the influence of Greco-Roman antiquity on later societies, and perspectives on gender, ethnicity, and socio-economic class. Classics is a discipline rooted in the past, yet relevant to the contemporary world and modern institutions. The study of classical antiquity and its subsequent traditions helps students make informed observations about the present and the future.

1.    Major in Classics
2.    Minor in Classics
3.    Joint Major in Classics
4.    Honours in Classics
5.    Joint Honours in Classics

Classics course descriptions are found at the end of the Faculty of Humanities and Social Sciences section under Course Descriptions, Classics and are designated by CLAS."

55.5    Page 252, 2021-2022 University Calendar section 6.1.2.1 Breadth of Knowledge Requirement amend as follows:

"6.1.2.1 Breadth of Knowledge Requirement
The Breadth of Knowledge Requirement … chosen from: Anthropology, Archaeology, Classics, Communication Studies, Criminology (or the former Police studies), Economics, English, Folklore, French, Gender Studies, Geography, German, History, Languages, Law and Society, Linguistics, Medieval Studies, Philosophy, Political Science, Religious Studies, Russian, Sociology, Spanish courses."

55.6    Faculty of Engineering and Applied Science

Page 125, 2021-2022 University Calendar under sub heading 11.3 Electrical and Computer Engineering, amend 7420 Computer Security to read follows:

**"**7420 Computer Security ...
CO: ECE 7400 or the former ENGI 7894
CR: the former ENGI 7864
LH:  eight 3-hour sessions per semester …"

Faculty of Engineering and Applied Science (cont'd)

Page 131, 2021-2022 University Calendar under sub heading 11.6 Ocean and Naval Architectural Engineering amend the course ONAE 3054 to read as follows:

"ONAE 3054 Ocean Engineering Hydrostatics …
CR: the former ENGI 3054
LH: at least nine 3-hour sessions per semester
PR: ENGI 1010, Mathematics 1001"

Amend the course ONAE 4007 to read as follows:

"ONAE 4007 Marine Materials …
CR: the former ENGI 4007, the former ENGI 7007
LH: at least 4 three-hour sessions per semester
PR: Chemistry 1050, ENGI 1010, ONAE 3001 or the former ENGI 3001"

Amend the course ONAE 5020 to read as follows:

"ONAE 5020 Marine Propulsion …
CR: the former ENGI 5020, the former ENGI 6020 LH: at least two 3-hour sessions per semester
PR: ONAE 4011 or the former ENGI 4011 former ENGI 4020."

Amend the course ONAE 5022 to read as follows:

"ONAE 5022 Probability and Random Processes in Ocean Engineering …
CR: the former ENGI 5022 OR: tutorial one hour per week
PR: Mathematics 2260 or the former Mathematics 3260, ONAE 3001 or the former ENGI 3001, ONAE 3001 or the former ENGI 3001"

Amend the course ONAE 5034 to read as follows:

"ONAE 5034 Marine Vibrations …
CR: the former ENGI 5034, the former ENGI 5932, the former ENGI 6933, Mechanical Engineering 6303
LH: at least four 2-hour sessions per semester
PR: Mathematics 2260, Mechanical Engineering 3301 or the former ENGI 3934"

Amend the course ONAE 6002 to read as follows:

"ONAE 6002 Ship Structures I
CR: the former ENGI 5003, the former ENGI 6002
LH: at least five 3-hour sessions per semester
PR: Civil Engineering 4310 or the former ENGI 4312, ONAE 4007 or the formerENGI4007 or the former ENGI 7007"

Faculty of Engineering and Applied Science (cont'd)

Amend the course ONAE 6005 to read as follows:

"ONAE 6005 Floating Ocean Structures Design …
CR: the former ENGI 6005, the former ENGI 7005
LH: 1
PR: ONAE 3001 or the former ENGI 3001, ONAE 3054 or the former ENGI 3054"

Amend the course ONAE 6036 to read as follows:

"ONAE 6036 Dynamics of Ocean Vehicles …
CR: the former ENGI 6030, the former ENGI 6036, the former ENGI 7035
LH: at least two 3-hour sessions per semester
OR: 1 tutorial hour per week
PR: ONAE 4020 or the former ENGI4020,ONAE 5022 or the former ENGI 5022, ONAE 5034 or the former ENGI 5034 or the former ENGI 5932 or the former ENGI 6933 or Mechanical Engineering 6303"

Amend the course ONAE 6046 to read as follows:

"ONAE 6046 Marine Engineering System …
CR: the former ENGI 6046, the former ENGI 7045
LH: 1
PR: Mechanical Engineering 3401 or the former ENGI 3901, ONAE 5034 or the former ENGI 5034"

Amend the course ONAE 6055 to read as follows:

"ONAE 6055 Marine Cybernetics …
Course components include: basic control actions and response of control systems; simulation and design of control systems; dynamic positioning; power management; marine automation.
CR: the former ENGI 6055
LH: at least four 2-hour sessions per semester
PR: ONAE 4011 or the former ENGI 4011, ONAE 5034 or the former ENGI 5034 or the former ENGI 5932 or the former ENGI 6933 or Mechanical Engineering 6303"

Amend the course ONAE 7000 to read as follows:

"ONAE 7000 Ocean Systems Design …
CR: the former ENGI 7000, the former ENGI 7052
LH: 3
PR: ENGI 4102, completion of Academic Term 6 of the Ocean and Naval Architectural Engineering program"

Faculty of Engineering and Applied Science (cont'd)

Amend the course ONAE 7002 to read as follows:

"ONAE 7002 Ship Structures II …
CR: the former ENGI 6003, the former ENGI 7002
LH: at least five 3-hour sessions per semester
PR: ONAE 5022 or the former ENGI 5022, ONAE 6002 or the former ENGI 6002
    or the former ENGI 5003"

Amend the course ONAE 7003 to read as follows:

"ONAE 7003 Small Craft Design…
CR: the former ENGI 7003, the former ENGI 8003
PR: completion of Academic Term 6 of the Ocean and Naval Architectural
    Engineering     program"

Amend the course ONAE 7033 to read as follows:

"ONAE 7033 Marine Hydrodynamics …
CR: the former ENGI 7033
LH: at least one 3-hour session per semester
OR: One tutorial hour per week
PR: Mathematics 3202, ONAE 5020 or the former ENGI 5020 or the former ENGI
    6020"

Amend the course ONAE 7046 to read as follows:

"ONAE 7046 Marine Economics and Ship Construction**...**
CR: the former ENGI 7046
PR: ENGI 4102, ONAE 6002 or the former ENGI 6002 or the former ENGI 5003"

Amend the course ONAE 8055 to read as follows:

"ONAE 8055 Design and Control of Unmanned Marine Vehicles …
CR: the former ENGI 8055
LH: at least four 3-hour sessions per semester
PR: ONAE 6055 or the former ENGI 6055 or approval of the instructor"

Amend the course ONAE 8075 to read as follows:

"ONAE 8075 Finite Element Analysis of Marine Structures …
CR: the former ENGI 8075
LH: 12 weekly 3-hour lab sessions
PR: ONAE 7002 or the former ENGI 7002 or the former ENGI 6003"

55.7    School of Pharmacy

Page 444, 2021-2022, University Calendar, under the heading 4.1.2.2 Advanced Pharmacy Practice Experience (APPE) amend as follows:

**"4.1.2.2 Advanced Pharmacy Practice Experience (APPE)**

Advanced Pharmacy Practice Experiences (APPE) may occur …

3.  For all APPEs, students are required to provide evidence of a valid Emergency First Aid Level C certificate or a Standard First Aid Level C certificate, as required by the provincial regulatory body where the placement will occur. Evidence of recertification must be submitted no later than one month before the expiry date."

55.8    Marine Institute

Page 143, 2021-2022 University Calendar, under the heading 6.2.1 Bachelor of Technology Program, amend Table 4 Bachelor of Technology- Engineering Technology and Applied Science as follows:

- Under Group A Electives add "TECH 4130"
- Under Group B Electives add "TECH 4120"

Page 146, 2021-2022 University Calendar, under the heading 6.2.2 Health Science Technology Major amend Table 5 Bachelor of Technology - Health Science Technology Major as follows:

- Under Group A Electives add "Tech 4130"
- Under Group B Electives add "Tech 4120"

Page 146, 2021-2022 University Calendar, under the heading 11.3 Technology amend the following courses:

"**4019 Research Methods** same as the former MSTM 4019…
CR:  the former MSTM 4019
PR:  one of TECH 4060, or the former MSTM 4060, one of TECH 4040 or the former MSTM 4040 and TECH 4025 or Statistics 1510 or 2500 or equivalent."

"**4400 Technological Assessment Project** (same as the former MSTM 4400) …
PR:  one of TECH 4019 or the former MSTM 4019."

Marine Institute (cont'd)

Add the following new course:

"4120 Conflict Management and Communication Strategies provides participants with an understanding of the basic principles of conflict resolution, negotiation, and effective communication and interpersonal skills to investigate and solve problems and manage conflicts within the workplace.
CR: MARI 4107, LEAD 4003"

Page 144, 2021-2022 University Calendar, under the heading 11.1 Leadership amend the course 4003 Communication and Conflict Management to read as follows:

"**4003 Communications and Conflict Management**
(same as MARI 4107, same as TECH 4120) … to ensure a safe and productive workplace.
CR: MARI 4107, TECH 4120"

Page 145, 2021-2022 University Calendar, under the heading 11.2 Maritime Studies amend the course 4107 Communications and Conflict Management to read as follows:

"**4107 Communications and Conflict Management**
(same as LEAD 4003, same as TECH 4120) provides … to ensure a safe and productive workplace.
CR: LEAD 4003, TECH 4120"

55.9  Grenfell Campus - School of Science and the Environment

Page 220, 2021-2022 University Calendar, under the heading 13.27 Science add the following new course:

**"2001 Women and Science** (same as Gender Studies 2001 and the former Women's Studies 2001) is an investigation of: historical and contemporary contributions of women scientists, especially Canadians; different sciences and how they study women; and feminist and other perspectives on gender and science.
CR: Gender Studies 2001, the former Women's Studies 2001"

Page 164, 2021-2022 University Calendar under section 7.1.4 Designated Writing Courses, in Table 1 Designated Writing Courses (W) insert the following course:

"Science: 2001"

Grenfell Campus - School of Science and the Environment (cont'd)

Page 210, 2021-2022 University Calendar, under the heading <u>13.16 Gender Studies</u> amend the following course:

**"2001 Women and Science** (same as Science 2001 and the former Women's Studies 2001)… gender and science.
CR: Science 2001, the former Women's Studies 2001"

Page 216, 2021-2022 University Calendar, under the heading <u>13.23 Physics</u> amend the following courses:

**"3220 Classical Mechanics I**
covers vector operations … calculus of variations, and Lagrangian Dynamics.
CO: PHYS 2820, Mathematics 2260 and 3202
PR: PHYS 2820, Mathematics 2260 and 3202"

**"3230 Classical Mechanics II**
covers noninertial frames of reference … cross section, and Rutherford scattering.
PR: PHYS 3220, and Mathematics 2260 and 3202"

**"3250 Elementary Particles and Fields**
includes the Standard Model … theory of weak interactions.
PR: PHYS 3650, Mathematics 3202"

**"3650 Quantum Mechanics I**
includes a review of elementary … and approximation methods.
CO: Mathematics 3202
PR: Mathematics 2260 and 3202, PHYS 2056"

56.    <u>PLANNING AND BUDGET COMMITTEE</u>

56.1   <u>Annual Plan 2021-22 Academic Year</u>

The Senate received and reviewed the Annual Plan of the Planning and Budget Committee for the 2020-2021 Academic.  It was noted that the mandate of the Planning and Budget Committee (PBC) is to advise the University on planning and budget concerns. The report summarized the work of the Committee over the past year and referenced the impacts of the pandemic.   A copy of the Annual Plan is lodged in the Senate files.

**REGULAR AGENDA**

57.   REPORT OF THE SENATE COMMITTEE ON UNDERGRADUATE STUDIES

57.1  Faculty of Engineering and Applied Science

The Senate received and reviewed a proposal from the Senate Committee on Undergraduate Programs for the new program in "Major in Mechatronics Engineering".  After a discussion the program was approved as follows:

Page 105, 2021-2022 University Calendar, under the heading 4 Description of Program amend to read as follows:

**"4 Description of Program**

The Bachelor of Engineering Degree at Memorial University …. The Bachelor of Engineering degree program is available in the following seven majors: Civil Engineering, Computer Engineering, Electrical Engineering, Mechanical Engineering, Mechatronics Engineering, Ocean and Naval Architectural Engineering, and Process Engineering.

Engineering One, the first-year of the engineering program … Students will develop an understanding of the different engineering specialties, as well as the interdisciplinary nature of engineering practice.

The specialized major programs of Civil Engineering, Computer Engineering, Electrical Engineering, Mechanical Engineering, Mechatronics Engineering, Ocean and Naval Architectural Engineering, and Process Engineering are offered in academic terms 3 through 8.

Electives can be tailored to meet the needs of those who plan to go straight into industry and those who wish to join the increasing number of our graduates who are pursuing advanced degrees.

Courses of the Faculty are designated by … Department of Mechanical and Mechatronics Engineering; ONAE are courses offered by the Department of Ocean and Naval Architectural Engineering; and PROC are courses offered by the Department of Process Engineering."

Under section 4.1 Program of Study delete and replace "Clause 6" as follows:

"6. Upon entering Academic Term 3, students begin to specialize in their academic program, in one of the following seven majors: Civil Engineering, Computer Engineering, Electrical Engineering, Mechanical Engineering, Mechatronics Engineering, Ocean and Naval Architectural Engineering, or Process Engineering."

<u>Faculty of Engineering and Applied Science (cont'd)</u>

Under the heading <u>4.3 Bachelor of Engineering Majors,</u> delete and replace with the following:

"The Bachelor of Engineering degree program is available in the following seven majors: Civil Engineering, Computer Engineering, Electrical Engineering, Mechanical Engineering, Mechatronics Engineering, Ocean and Naval Architectural Engineering, and Process Engineering."

Immediately following the heading <u>4.3.4 Mechanical Engineering</u> insert the following new subsection 4.3.5 Mechatronics Engineering:

"**4.3.5 Mechatronics Engineering**

www.mun.ca/engineering/mte

Mechatronics Engineering is an interdisciplinary branch of engineering that comprises mechanical, electronic and electrical engineering systems. It often involves a combination of robotics, electronics, computer engineering, communications, control systems, and machine learning. In the future digital economy, automated combined mechanical and electrical systems are becoming increasingly prevalent.

Mechatronics engineers work in diverse fields that include automation and control of mechanical systems. This includes, but is not limited to, advanced manufacturing systems, robotics, autonomous driving, navigation, unmanned aerial vehicles (UAV), intelligent systems, remote diagnostics and telesurgery, autonomous underwater vehicles (AUV), remotely operated underwater vehicles (ROV), machine vision, advanced sensing and instrumentation."

Renumber the subsequent subsections "4.3.5" and "4.3.6" as "4.3.6" and "4.3.7".

Page 111, 2021-2022 University Calendar, under the heading <u>6 Program Regulations </u>insert the following new subheading:

"**6.5 Mechatronics Engineering Program Regulations**

**6.5.1 Mechatronics Engineering Major**
o The full-time 141 credit hour Bachelor of Engineering (Co-operative), Mechatronics
  Engineering Major, requires eight academic terms and four work terms.
o The 141 credit hours shall normally be taken in the academic terms and order asset out in Table 5 Mechatronics Engineering Major.
o Work terms shall normally be taken in the order as set out in Table 5 Mechatronics Engineering Major.

Faculty of Engineering and Applied Science (cont'd)

**Table 5 Mechatronics Engineering Major**

| Term | Required Courses | Elective Courses |
|---|---|---|
| **Engineering One** | Chemistry 1050<br>ENGI 1010, 1020, 1030, 1040<br>3 credit hours in English at the 1000 level<br>Mathematics 1000, 1001, 2050<br>Physics 1050, 1051 | Students who are expecting to successfully complete the Engineering One requirements by the end of the Winter semester may apply to undertake a work term during the Spring semester. In this case, the prerequisite course ENGI 200W is expected to be successfully completed during the Fall semester. All other students are expected to successfully complete ENGI 200W in the Winter semester of Engineering One. |
| In addition to meeting the requirements outlined below, a student must successfully complete four Complementary Studies courses as described under **Description of Program, Complementary Studies**. | | |
| **Fall Academic Term 3** | ENGI 3101, 3424<br>ME 3102, 3301<br>Electrical and Computer Engineering 3300, 3400 | |
| **Winter** | ENGI 001W or 002W | |
| **Spring Academic Term 4** | ENGI 4430<br>ME 4302, 4601<br>Electrical and Computer Engineering 4300, 4510 | |
| **Fall** | ENGI 001W or 002W or 003W | |
| **Winter Academic Term 5** | ENGI 4421<br>ME 5602<br>Civil Engineering 6470<br>Electrical and Computer Engineering 5300, 5610 | |
| **Spring** | ENGI 002W or 003W or 004W | |
| **Fall Academic Term 6** | ME 6202, 6303, 6701, 6702<br>Electrical and Computer Engineering 6810 | |
| **Winter** | ENGI 003W or 004W | |

| | or 005W (optional) | |
|---|---|---|
| **Spring Academic Term 7** | ME 4501, 7205, 7705 | 6 credit hours from ME 7204, 7210, 7220, 7230, 7603, 7703, Electrical and Computer Engineering 7200, 7401, Computer Science 4766, or other courses as specified by the Head of the Department of Mechanical and Mechatronics Engineering. |
| **Fall** | ENGI 004W or 005W (optional) or 006W (optional) | |
| **Winter Academic Term 8** | ENGI 8152 ME 8706 | 9 credit hours from ME 8304, 8305, Electrical and Computer Engineering 5500, 8210, 8410, 8610, 8630, Ocean and Naval Architectural Engineering 8055, Computer Science 6915, or other courses as specified by the Head of the Department of Mechanical and Mechatronics Engineering. |

"

Renumber subsequent subheadings accordingly.

Page 125, 2021-2022 University Calendar, under heading <u>11.3 Electrical and Computer Engineering</u> add the following new courses:

**"ECE 4510 Microprocessors and Digital Logic** includes number systems, logic gates, Boolean algebra. Karnaugh maps and combinational logic design, sequential logic and state machines, microprocessor architectures, micro-processor programming, GPIO, analog input and output, and serial communication.
CR: ECE 3500, ECE 4500
LH: five 3-hour sessions per semester
OR: tutorial 1 hour per week
PR: ENGI 1040, ENGI 3424, ECE 3300 (or the former ENGI 3821)"

Faculty of Engineering and Applied Science (cont'd)

**"ECE 5610 Sensors and Instrumentation** involves modelling, analysis, and design of mechanical measurement systems. Topics covered include Laplace transforms, lumped parameter modelling of electro-mechanical systems, static and dynamic characteristics of sensors, sampling and anti-aliasing, classification and selection of sensors for motion and process, op-amps and signal conditioning and processing, and data acquisition system design.
CR: ECE 4600, Mechanical Engineering 7203, the former ENGI 5952, the former ENGI 7930,
LH: five 3-hour sessions per semester
OR: tutorial 1 hour per week
PR: ENGI 1040, ENGI 3424, ECE 3300 or the former ENGI 3821"

**"8630 Introduction to Internet of Things** introduces the architectures, protocols, standards, and applications of the Internet-of-Things (IoT). Topics include: IoT concepts, architectures, and standards, communication and networking, computing and IoT data management, security and privacy, IoT applications, digital twins, and next generation cellular networks and their impact on IoTs. Through this course, students will be able to understand the key challenges of the IoT systems and develop proper conceptual and technological solutions to real-world problems.
LH: at least four 3-hour sessions per semester
PR: ECE 4510, ECE 5610"

**"7210 Industrial Automation** introduces programmable logic controllers (PLC) and ladder logic programming, sensor and actuator interfaces, DC and AC motors, pneumatic circuits, fluid power actuators and control, industrial data communication, supervisory control and data acquisition (SCADA) and human machine interface (HMI).
LC: minimum of 2 lecture hours per week
LH: five 3-hour sessions per semester
PR: ME 6202 or the former ENGI 6951, ME 6701 or the former ENGI 6928 or the former ENGI 7928"

**"7220 Guidance, Navigation, and Control** provides applied knowledge in the design of navigation algorithms used in aerial autonomy, marine robotics, and self-driving applications. Topics covered include modelling platform and sensor dynamics, stochastic processes, linear state space GN&C solutions, nonlinear GN&C solutions, optimal filtering, trajectory optimization, factor graphs, and performance analysis.
LH: at least three 3-hour sessions per semester
PR: ENGI 4421, ME 6202 or the former ENGI 6951"

Faculty of Engineering and Applied Science (cont'd)

**"7230 Introduction to MEMS** provides the fundamentals in micro-electro-mechanical systems (MEMS) using examples from industrial MEMS applications. Topics include essential electrical and mechanical concepts for MEMS; fabrication processes for MEMS devices; basic MEMS governing equations in different energy domains (mechanical, electrical and thermal); methods for layout, design and modelling of MEMS devices; simulation techniques; techniques for testing and characterization of MEMS devices; thermal sensing and actuation; surface micro machining; and case studies.
LH: at least three 3-hour sessions per semester
PR: ME 6202 or the former ENGI 6951"

**"7705 Mechatronics Design Project I** provides an opportunity for senior students to integrate the knowledge that they have acquired through the junior terms and apply it to solving a mechatronics engineering design problem. Students work in small teams with the assistance of a faculty mentor to define an appropriate design problem and propose a method of solution to the problem. The project is continued in ME 8706.
CR: the former ENGI 7926, the former ENGI 7936
LC: at least 10 lecture hours per semester
LH: scheduled as required
OR: weekly meetings with project supervisor
PR: ENGI 4102, completion of Term 6 of the Mechatronics Engineering Program"

**"8706 Mechatronics Design Project II** continues ME 7705 and provides an opportunity for senior students to integrate the knowledge that they have acquired through the junior terms and apply it to solving a mechatronics engineering design problem. Students work in small teams with the assistance of a faculty mentor to complete detailed design, implementation and testing of a mechatronics engineering system to solve the problem as defined in ME 7705.
CR: the former ENGI 8926, the former ENGI 8936
LC: scheduled as required
LH: scheduled as required
PR: ME 7705"

**"6470 Thermal Sciences** (same as the former ENGI 6322) examines fundamental concepts associated with thermodynamics, fluid dynamics and heat transfer; first and second laws of thermodynamics; system and control volume analysis; classification of flows; introduction to boundary layers and drag; convection, conduction and radiation heat transfer; thermal insulation and calculation of R-values; and cooling of electrical components.
CR: the former ENGI 4322, the former ENGI 6322"

Faculty of Engineering and Applied Science (cont'd)

**"4300 Electronic Circuits I** (same as the former ENGI 4854) provides an introduction to semiconductor electronic devices and circuits. Topics covered include internal structure of electronic devices; working principles, dc and small-signal models and analysis of p-n junction diodes, bipolar junction transistors and field effect transistors; introduction to digital electronics; differential and multistage amplifier circuits; Miller's theorem; frequency response of discrete amplifiers; practical applications including power supplies, amplifiers and switching circuits. CAD tools are used to illustrate the analysis and design of electronic circuits.
CR: the former ENGI 4854
LH: eight 3-hour sessions per semester
OR: tutorial 1 hour per week
PR: ECE 3300 or the former ENGI 3821. Students completing a Minor in Applied Science - Electrical Engineering may successfully complete Physics 3550 as the prerequisite instead of ECE 3300"

**"5300 Electronic Circuits II …**
OR: tutorial 1 hour per week
PR: ECE 4300 or the former ENGI 4854, ECE 4600 or the former ENGI 4823. Students in the Mechatronics Engineering program may complete ECE 5610 as a corequisite instead of ECE 4600"

**"5500 Digital Systems** ...
LH: ten 3-hour sessions per semester
PR: ECE 3400 or the former ENGI 3891, ECE 4500 or ECE 4510 or the former ENGI 4862"

**"6202 Control Systems I …**
OR: 1-hour tutorial per week
PR: ME 5201 or Electrical and Computer Engineering 5610 or the former ENGI 5951 or the former ENGI 5952"

**"7200 Control Systems II …**
CR: the former ENGI 6825, the former ENGI 7825
PR: ECE 5200 or the former ENGI 5821, or ME 6202 or the former ENGI 6951"

**"8305 Modelling and Simulation of Dynamic Systems …**
CR: the former ENGI 8946
PR: ME 5201 or ME 7205 or the former ENGI 5952, ME 6303 or the former ENGI 6933"

**"8210 Supervisory Control and Data Acquisition …**
LH: at least four 3-hour sessions per semester
PR: ECE 5200 or the former ENGI 5821, or ME 6202 or the former ENGI 6951"

58.  <u>REPORT OF THE ACADEMIC COUNCIL OF THE SCHOOL OF GRADAUTE STUDIES</u>

58.1  <u>Master of Artificial Intelligence</u>

Senate received and reviewed background information pertaining to the proposed new program entitled "Master of Artificial Intelligence"   Following a discussion it was moved by Dr. Warren, seconded by Dr. Naterer, and carried that Senate approve the proposed new program Master of Artificial Intelligence as outlined in the background documentation and as follows:

Page 554, 2021-2022 University Calendar, insert the following new program (and number accordingly):

"**Regulations Governing the Degree of Master of Artificial Intelligence**

The Degree of Master of Artificial Intelligence (MAI) is a four-term, course-based Master's program jointly offered by the Department of Computer Science and the Department of Electrical and Computer Engineering.

**1 Qualifications for Admission**

1.  Admission is limited and competitive, and based on overall academic performance.

2.  To be considered for admission, applicants shall normally hold a minimum second class upper (or with at least a 75% average) 4-year Bachelor's Degree in computer science, computer engineering, or a related area such as data science, scientific computing, bioinformatics, or computational chemistry from a university of recognized standing.

3.  To be eligible for consideration for admission applicants shall meet the English Proficiency Requirements for graduate programs with higher English proficiency described at https://www.mun.ca/become/graduate/apply-to-memorial.

4.  Admission to the program shall be upon acceptance by the Dean of Graduate Studies after recommendation by the Chair of the Programme or either Head of the Departments of Computer Science or Electrical and Computer Engineering, along with a tentative program of study.

Master of Artificial Intelligence (cont'd)

**2 Degree Requirements**

1. The degree program requires the completion of 30 credit hours.

   (a)  3 credit hours of a Capstone project course AI 6002.

   (b) 18 credit hours (six courses) by completing AI 6000, AI 6001, COMP 6901, 6915, 6980 and ENGI 9818.

   (c)  9 credit hours (three courses) to be selected from COMP 6907, 6912, 6934, 6981, 6982, 6936, DSCI 6601, 6602, ENGI 9804, 9805, 9821, 9826, 9940 and MATH 6205.

**3 Evaluation**

Students must obtain a grade of at least 65% in all program courses to receive credit for the course towards their program requirements. Any student who fails to receive 65% or more in a course must repeat the course in the case of core courses, or must either repeat or replace the course with another program course in the case of elective courses. Any student who receives a grade of less than 65% in two courses or in a repeated course will be required to withdraw from the program."

58.2    Master of Applied Science in Software Engineering

Senate received and reviewed background information pertaining to the proposed new program entitled "Master of Applied Science in Software Engineering". Following a discussion it was moved by Dr. Warren, seconded by Dr. Naterer, and carried that Senate approve the proposed new program Master of Applied Science in Software Engineering as outlined in the background documentation and as follows:

Page 554, 2021-2022 University Calendar, insert the following new program (and number accordingly).

**"Regulations Governing the Degree of Master of Applied Science in Software Engineering**

The Degree of Master of Applied Science (M.A.Sc.) in Software Engineering is a four-term, course-based Master's program jointly offered by the Department of Computer Science and the Department of Electrical and Computer Engineering.

<u>Master of Applied Science in Software Engineering (cont'd)</u>

**1 Qualifications for Admission**

1.  Admission is limited and competitive, and based on overall academic performance.

2.  To be considered for admission, applicants shall normally hold a minimum second-class 4-year Bachelor's Degree in computer science, computer engineering or in a related discipline from a university of recognized standing.

3.  To be eligible for consideration for admission applicants will meet the English Proficiency Requirements described under General Regulations, English Proficiency Requirements.

4.  Admission to the program shall be upon acceptance by the Dean of Graduate Studies after recommendation by the Chair of the Program or either Head of the Departments of Computer Science or Electrical and Computer Engineering, along with a tentative program of study.

**2 Degree Requirements**

1. The degree program requires the completion of 30 credit hours.

   a. 3 credit hours of a Capstone project course ENGI 9837.
   b. 18 credit hours by completing ENGI 9818, COMP 6901, COMP 6905, ENGI 9867, ENGI 9874, and ENGI 9839.
   c. 9 credit hours (three courses) to be selected from COMP 6904, 6908, 6910,6916, 6921, 6922, 6925, 6934, ENGI 9807, 9869, 9876, 9877, ENGI 9838, and AI 6001.

**3 Evaluation**

Students must obtain a grade of at least 65% in all program courses to receive credit for the course towards their program requirements. Any student who fails to receive 65% or more in a course must repeat the course in the case of core courses, or must either repeat or replace the course with another program course in the case of elective courses. Any student who receives a grade of less than 65% in two courses or in a repeated course will be required to withdraw from the program.

Master of Applied Science in Software Engineering (cont'd)

**Core courses**
ENGI 9818 Software Fundamentals
COMP 6901 Applied Algorithms
COMP 6905 Software Engineering
ENGI 9867 Advanced Computing Concepts for Engineering
ENGI 9874 Software Design and Specification
ENGI 9839 Software Verification and Validation
ENGI 9837† Software Engineering Capstone
† Normally ENGI 9837 will be taken in the final term

**Elective courses**
COMP 69041 Advanced Computer Architecture
ENGI 98611 High-Performance Computer Architecture
COMP 6908 Database Technology and Applications
COMP 6910 Services Computing, Semantic Web and Cloud Computing
COMP 6916 Security and Privacy or ENGI 9807 Computer Security
COMP 6921 Syntax and Semantics of Programming Languages
COMP 6922 Compiling Methods
COMP 69252 Advanced Operating Systems
ENGI 98752 Embedded and Real-Time Systems Design
COMP 6934 Introduction to Data Visualization
ENGI 9872 Digital Communications
ENGI 9877 Cryptography
ENGI 9876 Advanced Data Networks
ENGI 98693 Advanced Concurrent Programming
COMP 69033 Concurrent Computing
ENGI 9838 Software Engineering Practice
AI 6001 Topics in Artificial Intelligence
1 Students can take one of COMP 6904 or COMP 9861
2 Students can take one of COMP 6925 or ENGI9875
3 Students can take one of ENGI 9869 or COMP 6903"

59. **PLANNING AND BUDGET COMMITTEE**

It was noted that typically in the spring of the year a Special meeting of Senate is to be arranged at the request of the Planning and Budget Committee (PBC). Senate was advised that a request would be forthcoming for this special meeting to be held in either March or April.

Ms. Snow, Interim Secretary of Senate, noted that she would follow up with Dr. Strzelczyk, Chair of PBC to determine the timing for the special meeting.

60. **OTHER BUSINESS**

There were no items to report under this heading.

61.    **<u>ADJOURNMENT</u>**

The meeting adjourned at 5:00 pm.


_____          _____
CHAIR                                              SECRETARY