SFU OFFICE OF THE ASSOCIATE VICE-PRESIDENT, ACADEMIC

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MEMORANDUM

ATTENTION	Senate	**DATE**	April 5, 2019
FROM	Wade Parkhouse, Chair Senate Committee on Undergraduate Studies	**PAGES**	1/1
RE:	Program Changes		

For information:

Acting under delegated authority at its meeting of April 4, 2019 SCUS approved the following curriculum revisions effective Spring 2020.

a. Faculty of Communication, Art and Technology (SCUS 19-29)

1. School of Interactive Arts and Technology

    (i) Lower division requirement changes to the Interactive Arts and Technology Major and Honours, Bachelor of Science programs

b. Faculty of Environment (SCUS 19-30)

1. The School of Resource and Environmental Management

    (i) Requirement changes to the REM Major program by adding the REM Planning stream

c. Faculty of Science (SCUS 19-31)

1. Department of Mathematics

    (i) Upper division requirement changes to the Mathematics Bachelor of Science Major program
    (ii) Upper division requirement changes to the Operations Research Bachelor of Science Major and Honours programs

Senators wishing to consult a more detailed report of curriculum revisions may do so on the Senate Docushare repository at
https://docushare.sfu.ca/dsweb/View/Collection-12682.

SFU
SENATE COMMITTEE ON
UNDERGRADUATE STUDIES

Calendar Entry Change
Name of Program or Name of Faculty: Interactive Arts and Technology, FCAT

Rationale for change: IAT 206W is being added as a requirement for the IAT BSc degrees to ensure that all students in 309W have the prerequisite skills. IAT recognizes a need to improve reading comprehension, critical thinking and writing skills in both the IAT BA and BSc degrees. To address this, a core set of existing W courses will be offered in a prerequisite chain: 103W, 206W, 309W. This will ensure that students take these courses in order, and that skills developed in these courses can be built upon and furthered.
Effective term and year: Spring 2020
The following program(s) will be affected by these changes: Interactive Arts and Technology Major, Bachelor of Science   Interactive Arts and Technology Honours, Bachelor of Science

Calendar Change: "to" and "from" sections are not required. All deletions should be crossed out as follows: ~~sample.~~ All additions should be marked by a **bold.**

Lower Division Requirements   CMPT 166 - An Animated Introduction to Programming (3)   or an equivalent introductory programming course such as CMPT 102, 120, 125, 126, 128, or 130   IAT 100 - Digital Image Design (3)   IAT 102 - Graphic Design (3)   IAT 103W - Design Communication and Collaboration (3)   IAT 106 - Spatial Thinking and Communicating (3)   IAT 167 - Digital Games: Genre, Structure, Programming and Play (3)   IAT 201 - Human-Computer Interaction and Cognition (3)   IAT 202 - New Media Images (3)   **IAT 206W – Media Across Cultures (3)**   IAT 222 - Interactive Arts (3)   IAT 233 - Spatial Design (3)   IAT 235 - Information Design (3)   IAT 265 - Multimedia Programming for Art and Design (3)   or other approved second year programming course   IAT 267 - Introduction to Technological Systems (3)

MACM 101 - Discrete Mathematics I (3)
and one additional three-unit lower division science course from computing science (CMPT), engineering science (ENSC), biomedical physiology and kinesiology (BPK), mathematics (MATH), statistics (STAT), or physics (PHYS)

Resource and Environmental Management Major
BACHELOR OF ENVIRONMENT

This major takes full advantage of the expertise existing across FENV units, characteristic of BEnv majors. It will prepare students to enter **employment** positions-or continue in graduate studies in the broadly defined areas of resource management **or planning**, including fisheries, agriculture, forestry, cultural resources, energy, and-tourism, **and rural, community and aboriginal resource planning**. REM program requirements, directed by educational goals, provide students with a solid understanding of the interplay of historical, biophysical and socio-cultural factors; Indigenous/First Nations Perspectives; resource use and sustainability; geospatial, statistical and modeling methodologies; decision making, communication, conflict resolution, and legislative/regulatory frameworks as they relate to resource management **and planning**.

The REM program requirements include courses from each of the areas of study in the BEnv core (i.e. earth systems, ecology, biology, human role in nature, the social and built environments, environmental stewardship and governance, and the global scale **and planning**).

Resource and Environmental Management Bachelor of Environment students are not eligible for the REM Minor.

Admission Requirements to the Resource and Environmental Management major – Planning stream

Students must apply to enter the REM Planning stream and must meet the following conditions to qualify:

- A minimum of 30 units completed
- A minimum CGPA of 3.33
- Completion of PLAN 200 with a minimum grade of B+
- Departmental approval

Minimum Grades for Management Stream

The minimum cumulative grade point average (CGPA) for continuation and graduation is 2.00.

Minimum Grades for Planning Stream

The minimum cumulative grade point average (CGPA) for continuation and graduation in the Resource and Environmental Management major Planning stream is 3.00.

Program Requirements for all streams

Students complete 120 units, including at least 45 upper division units, as specified below.

Note: Some of the courses below have prerequisites not included in the REM major requirements. Students are responsible for satisfying the prerequisites for all courses in their program. Students should review the upper division program requirements in advance to determine any lower division prerequisites they should complete.

Additional Program Requirements for Planning Stream

In addition to the REM major program requirements, Planning stream students are also required to complete the Faculty of Environment Coop program or two semesters of Planning Internship. Units from Coop and Internship courses do not count towards SFU degree requirements. Students planning to take the Coop program must meet the Faculty of Environment Coop admission requirements and apply two semesters prior to their first work term.

Course Substitutions

Substitutions of program requirements, including courses deemed equivalent to these required courses, are not allowed without written permission from the program. Such courses taken without approval will not be applied to graduation requirements. Students should consult their academic advisor for details on obtaining permission for substitutions.

Lower Division Requirements for all streams

Complete all of

FNST 101 – Introduction to First Nations Studies (3)
GEOG 111 – Earth Systems (3)
*POL 253 – Introduction to Public Policy (3)
REM 100 – Global Change (3)
REM 200 – Introduction to Resource and Environmental Management in Canada (3)

* May not be used when completing the Planning Stream

Choose one of

BISC 204 – Introduction to Ecology (3)
GEOG 215 – Biogeography (3)

Choose one of

GEOG 251 – Quantitative Geography (3)
STAT 201 – Statistics for the Life Sciences (3)
STAT 203 – Introduction to Statistics for the Social Sciences (3)
STAT 205 – Introduction to Statistics (3)

Choose one of

GEOG 253 – Introduction to Remote Sensing (3)
GEOG 255 – Geographical Information Science I (3)
* REM 221 – Systems Thinking and the Environment (3)

* May not be used when completing the Planning Stream

Choose one of

ARCH 201 – Reconstructing the Human Past (4)
ARCH 286 – Cultural Heritage Management (4)
FNST 212 – Indigenous Perceptions of Landscape (3)

Choose one of

GEOG 221 – Economic Worlds (3)
GEOG 241 – People, Place, Society (3)
* GEOG 261 – Encountering the City (3)
REM 281 – Sustainable Communities, Sustainable World (3) or SD 281 – Sustainable
Communities, Sustainable World (3)

* May not be used when completing the Management Stream

Additional Lower Division Requirements for Planning Stream

**In addition to the common requirements shown above, students who choose this
stream will complete 6 additional units, including all of**

PLAN 200 – Introduction to Planning (3)
**REM 202W – Technical Communication for Environmental Professionals and
Planners (3)**

Upper Division Requirements

Management Stream

Complete all of

REM 311 – Applied Ecology and Sustainable Environments (3)
REM 321 – Ecological Economics (4)
REM 356W – Institutional Arrangements for Sustainable Environmental Management (3)

Biophysical Perspectives on Resource and Environmental Management

Choose one of

ARCH 363 – Landscape Archaeology (3)
GEOG 315 – World Ecosystems (4)
GEOG 317 – Soil Science (4)
REM 370 – Global Resource Issues in Oceanography (3)
REM 375 – Ecology and Conservation of Coastal BC (3)

Quantitative Methods in Resource and Environmental Management

Choose one of

GEOG 352 – Spatial Analysis (4)
GEOG 353 – Advanced Remote Sensing (4)
GEOG 355 – Geographical Information Science II (4)
REM 412 – Environmental Modeling (3)
REM 423 – Research Methods in Fisheries Assessment (4)

Indigenous Perspectives on Resource and Environmental Management

Choose one of

FNST 332 – Ethnobotany of British Columbia First Nations (3)
FNST 353W – First Nations Heritage Stewardship (3)
FNST 433 – Indigenous Environmental Justice and Activism (4)
REM 406 – Indigenous People and Co-management (4)
REM 407 – Indigenous Governance and Resource Relationships (4)

Social and Community Perspectives on Resource and Environmental Management

Choose one of

ARCH 365 – Archaeological Perspectives on Human Ecology (3)
GEOG 377 – Environmental History (4) or HIST 377 – Environmental History (4)
GEOG 389W – Nature and Society (4)

REM 381 – Building Sustainable Communities: Concepts and Cases (4) or SD 381 – Building Sustainable Communities: Concepts and Cases (4)
SD 401 – Sustainable Development Goals Studio (4)

Communication and Conflict Resolution

Choose one of

CMNS 342 – Science and Public Policy: Risk Communication (4)
CMNS 349 – Environment, Media and Communication (4)
DIAL 460 – Seminar in Dialogue and Public Issues (4)
ENV 320W – Ethics and the Environment (3)
ENV 452 – Environmental Education (8) or EDUC 452 – Environmental Education (8)
EVSC 300 – Seminar in Environmental Science (3)

Policy, Planning and Regulation

Choose one of

ARCH 386 – Archaeological Resource Management (3)
FNST 401 – Aboriginal Peoples and Public Policy (3)
REM 319 – Environmental Law (3)
REM 446 – Environmental and Social Impact Assessment (4)

Resource and Environmental Management Sectors

Choose two of (one must be at the 400 level)

GEOG 327 – Geography of Tourism (4)
GEOG 385 – Food and the City (4)
REM 350 – Sustainable Energy and Materials Management (4)
REM 355 – Sustainable Transportation Management (3)
REM 427 – Avalanche Risk Management (4)
REM 445 – Environmental Risk Assessment (3)
REM 454 – Water Security (4)
REM 471 – Forest Ecosystem Management (3)
REM 481 – Sustainable Communities Leadership Lab (4) or SD 481 – Sustainable Communities Leadership Lab (4)

Upper Division Electives

Any other two REM courses from the full list of 300 and 400 level REM courses.

Capstone Experience

Complete the following

REM 495 – Resource and Environmental Management Capstone (4)

Planning Stream

Complete all of

REM 311 – Applied Ecology and Sustainable Environments (3)
REM 321 – Ecological Economics (4)
REM 356W – Institutional Arrangements for Sustainable Environmental Management (3)

Resource and Environmental Planning

Complete all of
PLAN 300 – Methods for Planning Analysis (4)
PLAN 319 – Environmental and Planning Law (3) or REM 319 Environmental and Planning Law (3)
PLAN 400 – Planning Theory and Policy Analysis (4)
PLAN 443 – Public Engagement, Mediation and Conflict Resolution in Planning (4)

Spatial Methods in Resource and Environmental Planning

Choose one of

GEOG 352 – Spatial Analysis (4)
GEOG 353 – Advanced Remote Sensing (4)
GEOG 355 – Geographical Information Science II (4)

Indigenous Perspectives on Resource and Environmental Management and Planning

Choose one of

FNST 353W – First Nations Heritage Stewardship (3)
FNST 401 – Aboriginal Peoples and Public Policy (3)
FNST 433 – Indigenous Environmental Justice and Activism (4)
REM 406 – Indigenous People and Co-management (4)

Social and Community Perspectives on Resource and Environmental Management and Planning

Choose one of

GEOG 389W – Nature and Society (4)

REM 381 – Building Sustainable Communities: Concepts and Cases (4) or SD 381 – Building Sustainable Communities: Concepts and Cases (4)
REM 446 – Environmental and Social Impact Assessment (4)
SD 401 – Sustainable Development Goals Studio (4)

Planning Specialization

Choose one of

PLAN 406 – Rural Planning and Development (4)
PLAN 407 – Indigenous Governance and Resource Relationships (4) or REM 407 – Indigenous Governance and Resource Relationships (4)
PLAN 408 – Environmental Planning for Sustainable Communities (4)

Resource and Environmental Management Sectors

Choose two of

GEOG 324 – Geography of Transportation (4)
GEOG 327 – Geography of Tourism (4)
GEOG 363 – Urban Planning and Policy (4)
GEOG 385 – Food and the City (4)
REM 350 – Sustainable Energy and Materials Management (4)
REM 355 – Sustainable Transportation Management (3)
REM 370 – Global Resource Issues in Oceanography (3)
REM 375 – Ecology and Conservation of Coastal BC (3)
REM 427 – Avalanche Risk Management (4)
REM 445 – Environmental Risk Assessment (3)
REM 454 – Water Security (4)
REM 471 – Forest Ecosystem Management (3)

Practical Experience

Complete the following

* ENV 302 – Environment Practicum 1 (3)
* ENV 303 – Environment Practicum II (3)
OR
PLAN 302 – Planning Internship 1 (1)
PLAN 402 – Planning Internship 2 (1)

* Units from this course do not count towards the units required for an SFU degree.

Capstone Experience

Complete the following

PLAN 495 – Professional Planning Capstone

Calendar Entry Change
Mathematics Major - Bachelor of Science

Rationale for change: The new courses STAT 310, 311, 320 are not intended for Math Major students.	

Effective term and year: Spring 2020	

The following program(s) will be affected by these changes: Major - Mathematics Bachelor of Science	

Calendar Change: "to" and "from" sections are not required. All deletions should be crossed out as follows: ~~sample.~~ All additions should be marked by a **bold.**

Upper Division Requirements

Students complete a minimum of 30 program units, including the 15 outlined below.

MATH 340 - Algebra II: Rings and Fields (3)

and one of

MATH 343 - Applied Discrete Mathematics (3)
MATH 345 - Introduction to Graph Theory (3)
MATH 408 - Discrete Optimization (3)
MATH 443 - Combinatorial Theory (3)
MATH 447 - Coding Theory (3)

and one of

MATH 320 - Introduction to Analysis II (3)
MATH 322 - Complex Variables (3)

and one of

MATH 338 - Advanced Linear Algebra (3)
MATH 341 - Algebra III: Groups (3)
MATH 342 - Elementary Number Theory (3)

and one of

MATH 310 - Introduction to Ordinary Differential Equations (3)
MACM 316 - Numerical Analysis I (3)

The remaining 15 units can be chosen from any upper division MATH or MACM course. Up to 6 of the 15 units can be chosen from the list below.

PHYS 413 - Advanced Mechanics (3)

Any upper division STAT course except for STAT 302, STAT 305, **STAT 310, STAT 311, STAT 320,** and STAT 403.

Within the 30 program units, students must complete 9 units of 400 level course work, as outlined below (excluding directed studies, job practicum, or honours essay courses):

6 units of MATH or MACM courses
3 units of courses from the list of PHYS and STAT courses above (within the 6 allowed units) or 3 units of any other MATH or MACM course.

SFU SENATE COMMITTEE ON
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Calendar Entry Change
Operations Research Major - Bachelor of Science

Rationale for change: The new courses STAT 310, 311, 320 are not intended for Math Operations Research Major students.
Effective term and year: Spring 2020
The following program(s) will be affected by these changes: Major   - Operations Research Bachelor of Science

Calendar Change: "to" and "from" sections are not required. All deletions should be crossed out as follows: ~~sample.~~ All additions should be marked by a **bold.**

Upper Division Requirements

Students complete all of

MATH 308 - Linear Optimization (3)
MATH 348 - Probabilistic Models in Operations Research (3)
MATH 402W - Operations Research Clinic (4)

and four of

MATH 309 - Continuous Optimization (3)
MATH 408 - Discrete Optimization (3)
MATH 448 - Network Flows (3)
STAT 350 - Linear Models in Applied Statistics (3)
STAT 380 - Introduction to Stochastic Processes (3)

and at least one of

CMPT 305 - Computer Simulation and Modelling (3)
CMPT 307 - Data Structures and Algorithms (3)

MACM 316 - Numerical Analysis I (3)

MATH 343 - Applied Discrete Mathematics (3)

MATH 345 - Introduction to Graph Theory (3)

and at least 6 additional units from the following list

ECON 435 - Econometric Methods (5)

Any upper division STAT course except for STAT 302, STAT 305, **STAT 310, STAT 311, STAT 320,** and STAT 403.

NOTE: SFU students enrolled in the Accelerated Master's degree program within the Department of Mathematics may apply a maximum of 10 graduate course units, taken while completing the bachelor's degree, towards the upper division undergraduate electives of the bachelor's program and the requirements of the master's degree. For more information go to:
http://www.sfu.ca/dean-gradstudies/future/academicprograms/AcceleratedMasters.html

Calendar Entry Change
Operations Research Honours - Bachelor of Science

Rationale for change:

The new courses STAT 310, 311, 320 are not intended for Math Operations Research Honours students.

Effective term and year:
Spring 2020

The following program(s) will be affected by these changes:
Honours
- Operations Research Bachelor of Science

Calendar Change: "to" and "from" sections are not required. All deletions should be crossed out as follows: ~~sample.~~ All additions should be marked by a **bold.**

Upper Division Requirements

Students complete a total of 48 units, including all of

MATH 308 - Linear Optimization (3)
MATH 348 - Probabilistic Models in Operations Research (3)
MATH 402W - Operations Research Clinic (4)

and five of

MATH 309 - Continuous Optimization (3)
MATH 320 - Introduction to Analysis II (3)
MATH 408 - Discrete Optimization (3)
MATH 448 - Network Flows (3)
STAT 350 - Linear Models in Applied Statistics (3)
STAT 380 - Introduction to Stochastic Processes (3)

and at least one of

CMPT 305 - Computer Simulation and Modelling (3)

CMPT 307 - Data Structures and Algorithms (3)

MACM 316 - Numerical Analysis I (3)

MATH 343 - Applied Discrete Mathematics (3)

MATH 345 - Introduction to Graph Theory (3)

and at least 6 additional units from the following list

ECON 435 - Econometric Methods (5)

Any upper division STAT course except for STAT 302, STAT 305, **STAT 310, STAT 311, STAT 320,** and STAT 403.

To complete the required 48 upper division units, students complete additional coursework, of which at least two courses must be 400-level MATH or MACM courses with the possibility of substituting a 400-level course from another department subject to advisor approval. Courses used to fulfil this upper division requirement cannot be used to satisfy the interdisciplinary requirement. All courses pertaining to the required 48 upper division units must be approved by the program advisor in the Department of Mathematics.

NOTE: SFU students enrolled in the Accelerated Master's degree program within the Department of Mathematics may apply a maximum of 10 graduate course units, taken while completing the bachelor's degree, towards the upper division undergraduate electives of the bachelor's program and the requirements of the master's degree. For more information go to:
http://www.sfu.ca/dean-gradstudies/future/academicprograms/AcceleratedMasters.html