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MEMORANDUM ─────────────────────────────────

ATTENTION	Senate	**DATE**	October 2, 2020
FROM	Wade Parkhouse, Chair	**PAGES**	1/2
	Senate Committee on		
	Undergraduate Studies		
RE:	Program Changes		

For information:

Acting under delegated authority at its meeting of October 1, 2020, SCUS approved the following curriculum revisions effective Summer 2021.

a. Faculty of Applied Sciences (SCUS 20-69)

1. School of Computing Science

(i) Upper division requirement changes to the Computing Science and Linguistics Joint Major program

b. Faculty of Education (SCUS 20-70)

(i)   Description and requirement changes to the Professional Development Program (PDP)
(ii)   Description, title and requirement changes to the Professional Linking Program (PLP)
(iii) Description, title and requirement changes to the Professional Qualification Program (PQP)
(iv) Description, title and requirement changes to the Helping Ease Access for Returning Teachers (HEART) Practicum

c. Faculty of Science (SCUS 20-71)

1. Depart of Biological Sciences

(i) Upper division requirement changes to the Environmental Toxicology Minor program

2. Department of Biomedical Physiology and Kinesiology

(i) Requirement changes to the Professional Kinesiology Certificate

3. <u>Department of Statistics and Actuarial Sciences</u>

(i) Description, upper and lower division requirement changes to the Data Science Honours program
(ii) Description, upper and lower division requirement changes to the Data Science Major program
(iii) Upper division requirement changes to the Statistics Honours program
(iv) Upper division requirement changes to the Statistics Major program

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.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

Name of Program or Name of Faculty Computing Science and Linguistics Joint Major
Rationale for change: According to the calendar: "Students completing joint or double degrees, joint or double majors and honours, two extended minors or a double minor, will not be required to complete two sets of W, Q and B requirements. W, Q and B designated courses in either one or both disciplines of the major, honours or minor programs may be used to satisfy the writing, quantitative and breadth requirements." So listing CMPT 376W as a required course for this program is not correct (as students must have the freedom to take a W course from CS or Linguistics). That is why we propose to drop CMPT 376W from the required CMPT courses. We propose to replace it by CMPT 310, a course on Artificial Intelligence, as AI has become an integral part of the computational aspects of linguistics (natural language processing), and is a must for all CMPT and LING students.
Effective term and year: Summer 2021
The following program(s) will be affected by these changes: Computing Science and Linguistics Joint Major

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 Computing Science Requirements Students complete at least 24 units, including all of CMPT 300 - Operating Systems I (3) CMPT 307 - Data Structures and Algorithms (3) ~~CMPT 376W - Technical Writing and Group Dynamics (3)~~ **CMPT 310 - Artificial Intelligence Survey (3)** CMPT 413 - Computational Linguistics (3) and four courses chosen from four distinct concentration areas as listed in Table I. CMPT 308 and 379 are recommended.

SENATE COMMITTEE ON
UNDERGRADUATE STUDIES

Calendar Entry Change
Name of Program or Name of Faculty

Rationale for change: Update language and dates following implementation of EDUC 400 and change of name of TRB to TCB
Effective term and year: Summer 2021
The following program(s) will be affected by these changes: Professional Development Program (PDP)

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.**

Teacher Education (PDP) PROFESSIONAL DEVELOPMENT PROGRAM This sixteen month teacher education program is an integral component of the ~~b~~**B**achelor of ~~e~~**E**ducation requirements. Admission is by application. Declaration of BEd as a degree goal does not guarantee acceptance into the Professional Development Program (PDP). The Professional Development program is also available in French, for students aspiring to teach in Core French, French Immersion or Programme Francophone. See Bureau des affaires francophones et francophiles (BAFF) /Office of Francophone & Francophile Affairs (OFFA). Admission Requirements Applicants must be attending Simon Fraser University or be admissible. Candidates who have not attended Simon Fraser University previously, or who have not attended in any of the three terms prior to intended enrollment, must apply for admission or readmission. All candidates are required to complete the ~~on-line~~ **online** Professional Development Program application form located at http://www.sfu.ca/education/teachersed/programs/pdp/overview.html.

All applications must be submitted to the PDP admissions office by January 15.

All applicants pay the PDP application fee ~~on-line~~ **online** at http://www.sfu.ca/education/teachersed/programs/pdp/overview.html.

Elementary Applicants

Elementary applicants must, one full semester prior to the start of PDP, have completed a minimum of 76 units of courses acceptable for credit at Simon Fraser University (should include 16 units of upper division) including the following prerequisite courses:

six units in English (a maximum of three units of English composition may be included)
one course (three units) in each of Canadian history, Canadian geography, and laboratory science
MATH 190
~~it is recommended that~~ elementary applicants ~~should~~ **are recommended to** have education, fine and performing arts and kinesiology courses

Secondary Applicants

Applicants who plan to teach at the secondary level must fulfil the requirements of a four-year degree with a teachable major subject or two teachable minor subjects prior to commencing PDP.

TEACHABLE MAJORS OR MINORS

Anthropology*
Applied Mathematics
Archaeology*
Asia/Pacific Studies*
Biological Sciences
Canadian Studies*
Chemistry
Classics/Greek & Roman Studies*
Computing Science (Minor only)
Criminology*
Dance (FPA) (Minor only)
Earth Science
Economics*
English
First Nations Studies*
French
Gender Studies*
Geography*

Germanic Studies*
History*
Humanities (Minor only)*
International Relations/Studies*
Law*
Mathematics
Music (FPA)
Physical Education/Kinesiology (Minor only)
Physics
Political Science*
Slavic Studies*
Social Studies*
Sociology*
Spanish & Latin American Studies*
Theatre (FPA) (Minor only)
Visual Arts (FPA)
World Literature

*see Admission Requirements in the Faculty of Education:
http://www.sfu.ca/education/teachersed/programs/pdp/admissions-requirements.html

Students planning to teach at the secondary level must complete requirements prior to commencing PDP, except BEd candidates who cannot complete their degree until they have successfully completed PDP. These BEd candidates complete one teachable major or two teachable minors prior to commencing PDP. Students from other institutions may apply prior to degree completion.

Secondary applicants must complete six English units (a maximum of three units of English composition may be included) one full term prior to starting PDP.

It is recommended that applicants have credit for at least one EDUC course before applying for admission.

All Applicants

All PDP applicants are required to submit the following:

3 **three** online reference forms
a written essay described further on the PDP website at
http://www.sfu.ca/education/teachersed/programs/pdp/overview.html
a resumé

Before program admission, applicants must demonstrate competence in written and oral English (and written and oral French for French immersion and French as a second

language programs).

~~Students may be asked to submit evidence of good health before being considered for admission.~~

Students may be interviewed before being considered for program admission.

If the number of PDP applicants exceeds facilities and staffing capabilities, the admissions committee will select the best qualified candidates.

Admission selection is generally given to students whose applications show experience with and commitment to community service that may include teaching or other helping roles.

Because of the number of well qualified PDP applicants, it is unlikely that candidates who have been unsuccessful in four previous competitions will be considered favorably in any subsequent competition. Those who have been unsuccessful in gaining entry on at least four occasions are discouraged from further application.

Program ~~Description~~ **Requirements**

The program's duration is four terms.

Professional studies and activities are arranged in the following sequence.

In the first term, students complete

EDUC 400 - Foundations of Education and Schooling (15) *****

Through a combination of on-campus seminars and guided field experiences, students will investigate the historical, philosophical, social and cultural foundations of education and schooling, and begin to develop professional orientations and identities that recognize the expectations and responsibilities of practicing teachers. Grading is on a pass/withdraw basis.

In the second term, students complete both of**:**

EDUC 401W - Introduction to Classroom Teaching (8) *
EDUC 402W - Studies of Educational Theory and Practice (7) *

These courses are offered as an integrated program, combining theory and practice in both on-campus seminars and in-school practice in the second term of PDP. This is accomplished by alternating blocks of classroom teaching with workshops and instruction on campus.

During EDUC 401, students are assigned to a teacher (school associate) identified by school authorities and supervised by a faculty associate appointed by the University. Students observe, teach and participate in school routines and programs.

During EDUC 402, students participate in the study of teaching **and** learning**, and** make meaning of the complex world of educational practice, informed by extensive study of pedagogical literature.

In the third term, students complete**:**

EDUC 404 - Coursework Semester (0) **

Students complete registration in this course in consultation with the undergraduate program advisor, faculty members, and the student's faculty associate, to ensure that professional, academic and certification requirements are satisfied, or to satisfy the educational requirements of designated PDP modules. Students undertake 15 units of **upper division** study in education (18 units if no previous recognized education course has been completed).

Students completing degrees from the Faculties of Applied Sciences, Arts and Social Sciences, Business Administration, Communication, Art, and Technology, Environment, Health Sciences or Science may apply credit for EDUC 404 to that degree.

To be recommended for certification, in EDUC 404 the student**s** must achieve a **minimum** 2.0 grade point average **in courses taken towards the EDUC 404 requirement (or receive a P in Pass/Fail courses)**.

See EDUC courses for prerequisites and grading.

In the fourth term, students complete**:**

EDUC 405 - Teaching Semester (15) *

This course is a term of classroom experience supervised by University appointed faculty associates. The school placement is appropriate to the educational level and subject specialties in which the student expects to obtain certification. Students assume a large measure of responsibility and participate in a wide range of teaching and supervisory activities. School placements are made in school districts throughout the Lower Mainland.

* not offered in Summer Term

** this zero-unit course functions as an umbrella course where the student completes 15-18 units of course work

French Education

French ~~i~~Immersion, ~~programme cadre and basic French for kindergarten to grade 12~~ **Core French and Programme Francophone for grades 5-12** are normally available. The majority of the program in ~~i~~Immersion and ~~p~~Programme ~~cadre~~ **Francophone** is **offered** in French.

General Regulations

Students complete normal Simon Fraser University enrollment procedures before commencing studies in any term of the professional development program.

Successful applicants will be required to undergo a criminal record check. If the check indicates the applicant has a criminal record, that may preclude continuation in PDP.

Students must meet program goals, as outlined in the Professional ~~Development~~ **Programs** Handbook.

Those with valid reasons may be given permission by the professional programs director to interrupt their program participation. A formal request must be submitted in writing to the director. A program interruption requested by a student may normally last no longer than two years.

Students who indicate their intention to undertake a given PDP term and then do not honour this commitment are considered to have withdrawn from the program. Permission to re-enter is not given automatically.

Readmission

Students who withdraw from EDUC 400 must re-apply ~~to the admissions committee~~ **through PDP admissions**.

~~Students may apply for EDUC 401/402 or EDUC 405 re-entry by completing a re-entry application and submitting it and supporting documents to the Professional Programs director. Deadlines for re-application: March 15 for fall term; September 15 for spring term.~~

~~Permission to re-enter the program will be granted if the student has satisfactorily met the conditions for re-entry established when he/she interrupted or withdrew from the program and if space is available in the term for which the student applies.~~

EDUC 401/402: Students may apply for re-entry into EDUC 401/402 by the September 15 deadline for the following two spring terms. Students must meet the conditions for

re-entry outlined in their withdrawal paperwork. An interview may be required. Applications must be submitted within two years of the withdrawal. Re-Entry is competitive; there is no guarantee of admission to a particular semester.

EDUC 405: Students may apply for re-entry by the September 15 for the spring term or March 15 for the fall term. Students must meet the conditions for re-entry outlined in their withdrawal paperwork. An interview may be required. Applications must be submitted within two years of the withdrawal. Re-Entry is competitive; there is no guarantee of admission to a particular semester.

After being withdrawn from EDUC 405 for a second time, ~~a student~~ **students** may not re-enter the program unless by appeal.

Students who withdraw from PDP may apply for re-entry within two years of withdrawal. Students who do not re-enter within the specified time must reapply to the program and must meet the admission requirements at the time of reapplication.

~~Students who wish to re-enter EDUC 404 must apply to re-enter the program no later than six weeks prior to the beginning of the term. An application for re-entry to PDP must be completed.~~

Recommendation for Certification

The academic and professional records of all students who have completed the four professional development program terms will be subject to review by the faculty before a recommendation for certification is forwarded to the Teacher Certification Branch (TCB).

Course Challenge

Students with a minimum of one year of full-time teaching experience in Canada or in a school setting where English or French was the normal language of instruction, and where the curriculum was reasonably similar to a Canadian public school curriculum, may challenge EDUC 405 subject to the following.**:**

Course challenge applicants will be considered according to generally established requirements and procedures.

Normally, students can enroll in course challenge for EDUC 405 only while enrolled in EDUC 401/402. Additional full fees will be levied for challenging EDUC 405 regardless of whether the challenge is successful.

Course challenge credit for EDUC 405 will not be granted before successful completion of EDUC 401/402.

Applications, available from the Professional Programs director, must be submitted by: May 15 for the fall term; September 15 for the spring term.

Residency Requirements and Transfer Credit

At least half of the program's total units must be earned through Simon Fraser University study.
At least two thirds of the program's total upper division units must be earned through Simon Fraser University study.

Calendar Entry Change
Name of Program or Name of Faculty

Rationale for change: Update language following move to online applications, renaming of TRB to TCB, and to include procedures for applying for re-entry if withdrawn from the program.
Effective term and year: Summer 2021
The following program(s) will be affected by these changes: Professional Linking Program (PLP)

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.**

~~Professional Linking Program~~ **Teacher Education** (PLP) **PROFESSIONAL LINKING PROGRAM** This is a four term, part-time program for employed para-professionals, para-educators, adult educators and teachers (Francophone, trades, independent) who are operating on letters of permission issued from the Teacher Certification Branch (TCB) and who are seeking certification as teachers in British Columbia. Admission Requirements PLP applicants must be admissible to Simon Fraser University. Those who have never attended here, or who have not attended in any of the previous three terms prior to their intended enrollment, must apply for university admission. See Undergraduate Admission. Applicants complete the ~~Professional Linking Program (PLP)~~ **online** application form located at http://www.sfu.ca/education/teachersed/programs/plp/overview.html. Mail supporting documents to: Faculty of Education, Surrey campus, Special Programs Advisor, 250-13450 102nd Avenue, Surrey BC, V3T 0A3. All PLP applications must be submitted to the PLP admissions office by January 31 for the spring term. In addition to the standard requirements for admission to the University, PLP requires

candidates to have a minimum of two years of work experience in their fields at the time of application.

Elementary Applicants

Elementary applicants must, by the date of application, have completed a minimum of 76 units of courses acceptable for credit at Simon Fraser University (should include 16 units of upper division) including the following prerequisite courses:

six units in English (a maximum of three units of English composition may be included)
one course (three units) in each of Canadian history, Canadian geography, and laboratory science
MATH 190
elementary applicants ~~should~~ **are recommended to** have education, fine and performing arts and kinesiology courses

Secondary Applicants

Applicants who plan to teach at the secondary level must fulfil the requirements of a teachable major subject or two teachable minor subjects prior to commencing PLP.

TEACHABLE MAJORS OR MINORS

Anthropology*
Applied Mathematics
Archaeology*
Asia/Pacific Studies*
Biological Sciences
Canadian Studies*
Chemistry
Classics/Greek & Roman Studies*
Computing Science (Minor only)
Criminology*
Dance (FPA) (Minor only)
Earth Science
Economics*
English
First Nations Studies*
French
Gender Studies*
Geography*
Germanic Studies*
History*
Humanities (Minor only)*

International Relations/Studies*
Law*
Mathematics
Music (FPA)
Physical Education/Kinesiology (Minor only)
Physics
Political Science*
Slavic Studies*
Social Studies*
Sociology*
Spanish & Latin American Studies*
Theatre (FPA) (Minor only)
Visual Arts (FPA)
World Literature

*see Admission Requirements in the Faculty of Education:
http://www.sfu.ca/education/teachersed/programs/plp/admissions-requirements.html

Students planning to teach at the secondary level must complete requirements prior to commencing PLP, except BEd candidates who cannot complete their degree until they have successfully completed PLP. These BEd candidates complete one teachable major or two teachable minors prior to commencing PLP. Students from other institutions may apply prior to degree completion, but must have completed the degree one full term prior to commencing PLP.

Secondary applicants must complete six English units (a maximum of three units of English composition may be included) prior to starting PLP.

It is recommended that applicants have credit for at least one EDUC course before applying for admission.

All Applicants

All PLP applicants are required to have:

a minimum of two years of work experience in their current role as a paraprofessional, paraeducator, adult educator or letter of permission teacher
3 **three** online reference forms
completed the written assignment (described further on the PLP website at http://www.sfu.ca/education/teachersed/programs/plp/application-instructions1.html)
a resumé detailing the roles, responsibilities, duration and location of related work experience

Before program admission, applicants must demonstrate competence in written and oral

English (and written and oral French for French immersion and French as a second language programs).

~~Students may be asked to submit evidence of good health before being considered for admission.~~

Students may be interviewed before being considered for program admission.

Admission selection is based favorably on students whose applications show employment experience of working collaboratively with school professionals and community stakeholders in their roles and responsibilities to the children in their care. Commitment to community service is also given consideration both in teaching and other helping roles.

Program Requirements

~~The program's duration is four part-time terms.~~

Students complete all of**:**

EDUC 402W - Studies of Educational Theory and Practice (7)
EDUC 403 - Studies in Teaching and Learning (11)
EDUC 404 - Coursework Semester (0)
EDUC 405 - Teaching Semester (15)

During EDUC 402 (part-time studies), students participate in the study of teaching **and** learning**, and** make meaning of the complex world of educational practice, informed by extensive study of pedagogical literature. PLP students attend part time during evening and Saturday classes while maintaining full-time work.

During EDUC 403 (part-time studies), students will need to take a 3 week leave in order to complete a short practicum in a school with a supervising teacher. Students also attend seminar classes each week on Saturdays. The course integrates in school experiences with theoretical concepts discussed in seminars which are held during evenings and weekends. Students observe, practice teach and reflect on experiences in their practice teaching placement, and use these to further their understanding and practices as future teachers.

During EDUC 405 (full time studies; not offered in the summer term), students gain classroom experience while being supervised by University appointed faculty associates. The school placement is appropriate to the educational level and subject specialties in which the student expects to gain certification. Students assume a large measure of responsibility and participate in a wide range of teaching and supervisory activities. School placements are generally made in school districts in the Lower Mainland.

Readmission

EDUC 402: Students who withdraw from EDUC 402 must re-apply through Special Programs Admissions, Professional Programs.

EDUC 403: Students may apply for re-entry into EDUC 403 by the March 15 deadline for the two fall terms following the withdrawal. Students must meet the conditions for re-entry outlined in their withdrawal paperwork. An interview may be required. Applications must to be submitted within 2 years of the withdrawal. Re-Entry is competitive; there is no guarantee of admission to a particular semester.

EDUC 405: Students may apply for re-entry by September 15 for the spring term or March 15 for the fall term. Students must meet the conditions for re-entry outlined in their withdrawal paperwork. An interview may be required. Applications must to be submitted within 2 years of the withdrawal. Re-Entry is competitive; there is no guarantee of admission to a particular semester.

After being withdrawn from EDUC 405 for a second time, students may apply through PDP Admissions or Special Programs Admissions to start the programagain.

Residency Requirements and Transfer Credit

At least half of the program's total units must be earned through Simon Fraser University study.

At least two thirds of the program's total upper division units must be earned through Simon Fraser University study.

Calendar Entry Change
Name of Program or Name of Faculty

Rationale for change: Update language following move to online applications, renaming of TRB to TCB, and to include procedures for applying for re-entry if withdrawn from the program .
Effective term and year: Summer 2021
The following program(s) will be affected by these changes: Professional Qualification Program (PQP)

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.**

Teacher Education (PQP)

PROFESSIONAL QUALIFICATION PROGRAM

This is a ~~3~~ **three** term (36 units) program specifically developed for individuals with previous teaching experience and qualifications from outside Canada. Applicants to the PQP are foreign-trained teachers who have been evaluated by the **Teacher Certification Branch (**TCB**)** and have been recommended to complete the ~~Professional Qualification Program (PQP)~~ at SFU.

Admission Requirements

PQP applicants must be admissible to Simon Fraser University. Those who have never attended here, or who have not attended in any of the previous three terms prior to their intended enrollment, must apply for university admission. See Undergraduate Admission.

PQP applicants must also provide the ~~Professional~~ **Special** Programs admissions office with a ~~Teacher Certification Branch (~~TCB~~)~~ letter showing recommendation for enrollment in PQP or a similar program.

~~Send applications to: Faculty of Education, Surrey campus, Special Programs Advisor 250-13450 102ⁿᵈ Avenue, Surrey BC, V3T 0A3. These are due by March 31. An interview is required. Application available here.~~

All candidates are required to complete the online Professional Qualification Program application form located at https://www.sfu.ca/education/teachersed/programs/pqp/overview.html. Mail supporting documents to: Faculty of Education, Surrey campus, Special Programs Advisor, 250-13450 102nd Avenue, Surrey, BC, V3T 0A3.

An interview is required.

All applications must be submitted to the Special Programs admissions office by March 31.

All applicants pay the PQP application fee online at: https://www.sfu.ca/education/teachersed/programs/pqp/overview.html

All PQP applicants are required to submit the following:

three online reference forms
a written essay described further on the PQP website at: https://www.sfu.ca/education/teachersed/programs/pqp/application-instructions.html
a resumé
a letter of introduction
all transcripts
copies of any valid teaching certificates held
TCB evaluation letter

Before program admission, applicants must demonstrate competence in written and oral English.

If the number of PQP applicants exceeds facilities and staffing capabilities, the admissions committee will select the best qualified candidates.

Program Requirements

FIRST TERM

Students complete both of**:**

EDUC 352W - Building on Reflective Practice (4)
EDUC 483 - Designs for Learning: Curriculum Studies (8)

SECOND TERM

Students complete**:**

EDUC 401W - Introduction to Classroom Teaching (8)
and one additional upper division EDUC course (at least four units) selected by the student and approved by the director of PDP or designate.

THIRD TERM

Students complete:

EDUC 406 - Supervised Observation and Teaching (12)

Upon successful completion of the first two terms, students will then have satisfied the ~~Teacher Certification Branch (TCB)~~ familiarization and methodology requirement for the certification of foreign trained teachers. Upon approval of the director of ~~p~~Professional ~~p~~Programs, PQP students may then enter EDUC 406, and upon satisfactory completion of that course, will meet the TCB's practicum requirement for the certification of foreign trained teachers.

PQP students who complete all 36 units will also have met the requirements for the certificate in professional practices. In exceptional circumstances, the faculty associate and the PQP ~~co-ordinator~~ **coordinator** may recommend to the program director that the student complete EDUC 406 after completion of the first 12 units of PQP. In this case, the student does not need to complete the second term of course work. It is recommended that students complete at least eight units in Designs for Learning courses (EDUC 412W, 414-416, 430, 472-483, 485) to enhance classroom skills.

Readmission

Students who withdraw from EDUC 352, EDUC 483, or EDUC 401 must re-apply through Special Programs Admissions, Professional Programs.

EDUC 406: Students may apply for re-entry by September 15 for the spring term or March 15 for the fall term. Students must meet the conditions for re-entry outlined in their withdrawal paperwork. An interview may be required. Applications must be submitted within 2 years of the withdrawal. Re-Entry is competitive; there is no guarantee of admission to a particular semester.

After being withdrawn from EDUC 406 for a second time, students may apply through Special Programs Admissions, Professional Programs, to start the program again.

Residency Requirements and Transfer Credit

At least half of the program's total units must be earned through Simon Fraser University

study.
At least two thirds of the program's total upper division units must be earned through Simon Fraser University study.

Calendar Entry Change
Name of Program or Name of Faculty

Rationale for change: Update program title, description, dates, application requirements, and contact information
Effective term and year: Summer 2021
The following program(s) will be affected by these changes: Helping Ease Access for Returning Teachers (HEART) Practicum

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.**

~~Helping Expand Access for Returning Teachers (HEART) Practicum~~ **HELPING EASE ACCESS FOR RETURNING TEACHERS (HEART) PRACTICUM** ~~This is an extended practicum option involving between ten and twelve weeks of orientation, observation and teaching in a BC public school classroom. Applicants whose BC teacher certificate has expired, or applicants possessing a certificate from another province require a supporting letter from the Teacher Regulation Branch (TRB).~~ **The HEART Program supports teachers who need to recertify or acts as a refresher program for teachers who have been out of the classroom for a period of time. HEART is a one-semester program including a 2-week orientation and preparation time on campus followed by a 10-week practicum in a BC public school. The program offers educators an opportunity to reacquaint themselves with the BC school system, to update teaching requirements, and to acquire certification from the Teacher Certification Branch (TCB).** Admission Requirements Applicants must be attending Simon Fraser University, or be admissible. Applicants who have not attended Simon Fraser University previously, or who have not attended in any of three terms prior to intended enrollment in EDUC 406, must submit the application for undergraduate admission to Student Services.

Students intending to complete Simon Fraser University courses in preparation for application to EDUC 406 should email ~~educ_heart@sfu.ca~~ **the Special Programs advisor at educ_adv_surrey@sfu.ca**.

HEART applications should be received by: February 15 for fall term; September 15 for spring term. An interview is required. ~~Application available at:~~

Application available at:
http://www.sfu.ca/education/teachersed/programs/heart/overview.html

~~Applications should be sent to Faculty of Education, Professional Programs, attention Karen Hill.~~

All HEART applicants are required to submit the following:

three online reference forms
a resumé
a letter of introduction
all transcripts
one unit plan including two detailed lesson plans

If the number of HEART applicants exceeds facilities and staffing capabilities, the admissions committee will select the best qualified candidates.

Program Requirements

Students complete**:**

EDUC 406 - Supervised Observation and Teaching (12) *

This is a supervised orientation/observation and teaching sequence of about 12 weeks in a British Columbia public school. This practicum offers educators, who do not meet BC certification requirements, an opportunity to familiarize themselves with the BC school system and to update teaching skills to acquire certification. The course is normally offered in the fall and spring terms only and space is limited. Grading is on a pass/withdraw basis.

*not offered in Summer Term

Residency Requirements and Transfer Credit

At least half of the program's total units must be earned through Simon Fraser University study.

At least two thirds of the program's total upper division units must be earned through

SENATE COMMITTEE ON
UNDERGRADUATE STUDIES

Simon Fraser University study.

SENATE COMMITTEE ON
UNDERGRADUATE STUDIES

Calendar Entry Change
Name of Program or Name of Faculty

Rationale for change: HSCI 304 has been deleted and replaced by HSCI 204 so is no longer available as an upper division elective
Effective term and year: Summer 2021
The following program(s) will be affected by these changes: Environmental Toxicology Minor

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.**

Environmental Toxicology Minor

This program provides a thorough overview of environmental toxicology. Students who complete this program will be more qualified and eligible for employment with various businesses, governmental and non-governmental agencies, and academia engaged in environmental monitoring, assessment, and research.

Students who are interested in an environmental toxicology minor should contact the department early.

Program Requirements

A 2.00 or higher grade point average (GPA) is required.

Lower Division Requirements

The following courses are required. Most students who are pursuing science degree programs will already have credit for most of these courses.

Students complete all of

BISC 101 - General Biology (4)
BISC 102 - General Biology (4)
BISC 204 - Introduction to Ecology (3)
BISC 205 – Principles of Physiology (3)
CHEM 121 - General Chemistry and Laboratory I (4)
CHEM 122 - General Chemistry II (2)
CHEM 126 - General Chemistry Laboratory II (2)
CHEM 281 - Organic Chemistry I (4)
MBB 222 - Molecular Biology and Biochemistry (3)
MBB 231 - Cellular Biology and Biochemistry (3)
STAT 201 - Statistics for the Life Sciences (3)

and one of

CHEM 282 - Organic Chemistry II (2)
CHEM 283 - Organic Chemistry IIb (3)

and one of

MATH 150 - Calculus I with Review (4)
MATH 151 - Calculus I (3)
MATH 154 - Calculus I for the Biological Sciences (3)

and one of

MATH 152 - Calculus II (3)
MATH 155 - Calculus II for the Biological Sciences (3)

and one of

PHYS 101 - Physics for the Life Sciences I (3)
PHYS 120 - Mechanics and Modern Physics (3)
PHYS 125 - Mechanics and Special Relativity (3)
PHYS 140 - Studio Physics - Mechanics and Modern Physics (4)

and one of

PHYS 102 - Physics for the Life Sciences II (3)
PHYS 121 - Optics, Electricity and Magnetism (3)
PHYS 126 - Electricity, Magnetism and Light (3)
PHYS 141 - Studio Physics - Optics, Electricity and Magnetism (4)

Upper Division Requirements

Students complete both of

BISC 308 - Environmental Toxicology: An Ecological Perspective (3)
BISC 313 - Environmental Toxicology: A Mechanistic Perspective (3)

and one of

BISC 305 - Animal Physiology (3)
BISC 366 - Plant Physiology (3)
BPK 305 - Human Physiology I (3)
BPK 306 - Human Physiology II (3)

and three of

BISC 309 - Conservation Biology (3)
BISC 435 - Introduction to Pest Management (3)
BISC 439 - Industrial Microbiology (4)
BISC 445 - Environmental Physiology of Animals (3)
CHEM 371 - Chemistry of the Aqueous Environment (3)
BPK 431 - Integrative Cancer Biology (3)
~~HSCI 304 - Perspectives on Human Health and the Environment (3)~~
HSCI 323 - Principles of Pharmacology and Toxicology (3)
REM 311 - Applied Ecology and Sustainable Environments (3)
REM 350 - Sustainable Energy and Materials Management (4)
REM 412 - Environmental Modeling (4)
REM 445 - Environmental Risk Assessment (4)

and their prerequisites. ~~Students may receive permission to have the two HSCI 200 division course prerequisites waived for the HSCI courses (contact the Faculty of Health Sciences undergraduate program assistant).~~ Students missing REM prerequisites for REM courses may apply to the REM undergraduate program assistant for **a** waiver.

Name of Program or Name of Faculty Biomedical Physiology and Kinesiology
Rationale for change: Following the hiring of a new faculty member and the revision of BPK 481, we are now able to offer BPK 443 and BPK 481 several times per year. The option of one of these courses within the certificate provides flexibility for program completion while providing students with professional application in a specialized area of kinesiology. BPK 303 has recently been completely redeveloped, the new content provides students with learning opportunities and skills important for their development as professional kinesiologists. BPK 142 and 205 are embedded prerequisites so do not need to be listed.
Effective term and year: Summer 2021
The following program(s) will be affected by these changes: Professional Kinesiology Certificate

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.**

| Program Requirements
Students complete all of

BPK 110 - Human Nutrition: Current Issues (3)
~~BPK 142 - Introduction to Biomedical Physiology and Kinesiology (3)~~
BPK 143 - Exercise: Health and Performance (3)
BPK 180W - Introduction to Ergonomics (3)
~~BPK 205 - Introduction to Human Physiology (3) +~~
BPK 241 - Sports Injuries - Prevention and Rehabilitation (3) +
BPK 303 – Kinanthropometry: Assessment of Movement and Function (3) +
BPK 310 - Exercise/Work Physiology (3) +
BPK 326 - Functional Anatomy (4) +
BPK 340 - Active Health: Behavior and Promotion (3) +
BPK 343 - Active Health: Assessment and Programming (3) +
+courses have additional prerequisites

~~Strongly Recommended~~
And one of
BPK 443 - Advanced Exercise Programming (3)
BPK 481 – Musculoskeletal Disorders (3)
… |

Name of Program or Name of Faculty Data Science honours
Rationale for change: STAT 341 has been replaced by STAT 260+261, so this course change is reflected in the proposed changes below. We would also like to add CMPT 295 to the required courses because, as of Spring 2021, it will be made a prerequisite for CMPT 300 (another required course for the Data Science honours). References to DATA 481 has also been removed below, as this course has been discontinued.
Effective term and year: Summer 2021
The following program(s) will be affected by these changes: Data Science honours (DATAHON)

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.**

Data Science Honours Bachelor of Science The Department of Statistics and Actuarial Science and its partners, the Department of Mathematics, the Beedie School of Business, and the School of Computing Science, offer an honours program in Data Science (DATA) leading to a bachelor of science (BSc) with honours degree. This is a highly structured program providing a multidisciplinary approach to quantitative methods for business and industry in an environment of rapid changes in technology. The honours program offers specialization in one of 3 concentrations: Mathematics, Statistics, or Open Concentration. The program is managed by a steering committee consisting of representatives from the above-mentioned departments, and faculty serve as liaisons between participating departments and the program director. Students formally apply to be admitted into the program. Applications can be considered both for students entering Simon Fraser University, and for students already enrolled. Admission into the program is decided on a competitive basis. Students must maintain a 3.0 cumulative grade point average (CGPA) in DATA program course work to remain in the

program and to graduate. It is strongly recommended that students contact the ~~science~~ **Statistics** advisor or program director early about admission and scheduling.

Students who wish to combine the DATA honours program with another major or minor program should consult with the ~~Data Science director~~ **Statistics advisor**.

More information can be found on our website: http://www.sfu.ca/datascience.

Program Requirements

Under University regulations, an honours degree requires the completion of a minimum of 120 units, including a minimum of 60 upper division units. Honours program students require a graduation cumulative grade point average of not less than 3.00.

Mathematics Concentration Requirements

Lower Division Requirements

Students complete a minimum of ~~62~~ **68** units.

Business Administration

Students complete all of

BUS 200 - Business Fundamentals (3)
BUS 217W - Critical Thinking in Business (3)
BUS 251 - Financial Accounting I (3)
BUS 272 - Behaviour in Organizations (3)

Computing Science

Students complete all of

CMPT 120 - Introduction to Computing Science and Programming I (3)
CMPT 125 - Introduction to Computing Science and Programming II (3)
CMPT 127 - Computing Laboratory (3)
CMPT 225 - Data Structures and Programming (3)
CMPT 276 - Introduction to Software Engineering (3)
CMPT 295 - Introduction to Computer Systems (3)

Mathematics and Computing Science

Students complete all of

MACM 101 - Discrete Mathematics I (3)
MACM 201 - Discrete Mathematics II (3)
MACM 203 - Computing with Linear Algebra (2)
MACM 204 - Computing with Calculus (2)

Data Science

Students complete

DATA 180 - Undergraduate Seminar in Data Science (1) ‡

Mathematics

Students complete one of

MATH 150 - Calculus I with Review (4) *
MATH 151 - Calculus I (3)
MATH 154 - Calculus I for the Biological Sciences (3)
MATH 157 - Calculus I for the Social Sciences (3)

and all of

MATH 152 - Calculus II (3)
MATH 208W - Introduction to Operations Research (3)
MATH 242 - Introduction to Analysis I (3)
MATH 251 - Calculus III (3)

and one of

MATH 232 - Applied Linear Algebra (3)
MATH 240 - Algebra I: Linear Algebra (3) *

Statistics

Students complete ~~both~~ **all** of
STAT 240 - Introduction to Data Science (3)
STAT 260 - Introductory R for Data Science (2)
STAT 261 - Laboratory for Introductory R for Data Science (1)
STAT 270 - Introduction to Probability and Statistics (3)

* Recommended

‡ ~~DATA 180 and DATA 481 cannot be completed concurrently~~
Upper Division Requirements

Students complete a minimum of ~~53~~ **50** units.

Business Administration~~, Economics~~

Students complete all of

BUS 343 - Introduction to Marketing (3)
BUS 360W - Business Communication (4)

Computing Science

Students complete all of

CMPT 300 - Operating Systems I (3)
CMPT 307 - Data Structures and Algorithms (3)
CMPT 353 - Computational Data Science (3)
CMPT 354 - Database Systems I (3)
CMPT 454 - Database Systems II (3)

~~Data Science~~

~~Students complete~~
~~DATA 481 - Undergraduate Seminar in Data Science (1) †~~

Mathematics and Computing Science

MACM 316 - Numerical Analysis I (3)

Mathematics

Students complete one of

MATH 308 - Linear Optimization (3)
MATH 309 - Continuous Optimization (3)

and one of

MACM 409 - Numerical Linear Algebra: Algorithms, Implementation and Applications (3)
MATH 320 - Introduction to Analysis II (3)
MATH 340 - Algebra II: Rings and Fields (3)
MATH 343 - Applied Discrete Mathematics (3)
MATH 345 - Introduction to Graph Theory (3)
MATH 348 - Introduction to Probabilistic Models (3)

And

MATH 402W - Operations Research Clinic (4)

and one additional 400-level MATH course

Statistics

Students complete one of

ECON 333 - Statistical Analysis of Economic Data (4)
STAT 302 - Analysis of Experimental and Observational Data (3)
STAT 305 - Introduction to Biostatistical Methods for Health Sciences (3)
STAT 350 - Linear Models in Applied Statistics (3)

and ~~all~~ **both** of

~~STAT 341 - Introduction to Statistical Computing and Exploratory Data Analysis - R (2)~~
STAT 403 - Intermediate Sampling and Experimental Design (3)
STAT 452 - Statistical Learning and Prediction (3)

and one of

STAT 445 - Applied Multivariate Analysis (3)
STAT 475 - Applied Discrete Data Analysis (3)
STAT 485 - Applied Time Series Analysis (3)

~~† DATA 180 and DATA 481 cannot be completed concurrently~~
Open Concentration Requirements

Lower Division Requirements

Students complete a minimum of ~~52~~ **58** units.

Business Administration

Students complete all of

BUS 200 - Business Fundamentals (3)
BUS 217W - Critical Thinking in Business (3)
BUS 251 - Financial Accounting I (3)
BUS 272 - Behaviour in Organizations (3)

Computing Science

Students complete all of

CMPT 120 - Introduction to Computing Science and Programming I (3)
CMPT 125 - Introduction to Computing Science and Programming II (3)
CMPT 127 - Computing Laboratory (3)
CMPT 225 - Data Structures and Programming (3)
CMPT 276 - Introduction to Software Engineering (3)
CMPT 295 - Introduction to Computer Systems (3)

Mathematics and Computing Science

Students complete both of

MACM 101 - Discrete Mathematics I (3)
MACM 201 - Discrete Mathematics II (3)

Data Science

Students complete

DATA 180 - Undergraduate Seminar in Data Science (1)‡

Mathematics

Students complete one of

MATH 150 - Calculus I with Review (4) *
MATH 151 - Calculus I (3) *
MATH 154 - Calculus I for the Biological Sciences (3)
MATH 157 - Calculus I for the Social Sciences (3)

and both of

MATH 152 - Calculus II (3)
MATH 208W - Introduction to Operations Research (3)

and one of

MATH 232 - Applied Linear Algebra (3)
MATH 240 - Algebra I: Linear Algebra (3) *

Statistics

Students complete **all of**

STAT 240 - Introduction to Data Science (3)
STAT 260 - Introductory R for Data Science (2)
STAT 261 - Laboratory for Introductory R for Data Science (1)

and one of

BUS 232 - Data and Decisions I (4)
STAT 201 - Statistics for the Life Sciences (3)
STAT 203 - Introduction to Statistics for the Social Sciences (3)
STAT 205 - Introduction to Statistics (3)
STAT 270 - Introduction to Probability and Statistics (3)

* Recommended

† DATA 180 and DATA 481 cannot be completed concurrently
Upper Division Requirements

Students complete a minimum of ~~55~~ **52** units.

Business Administration~~, Economics~~

Students complete all of

BUS 343 - Introduction to Marketing (3)
BUS 360W - Business Communication (4)
BUS 439 - Analytics Project (3) *
BUS 445 - Customer Analytics (3) **

*For this course, Data Science students are eligible for a prerequisite waiver for BUS 345, 437, 445, 462, 464, 90 units. Students should consult with their program advisor.

**For this course, Data Science students are eligible for a prerequisite waiver for BUS 336. Students should consult with their program advisor.

Computing Science

Students complete all of

CMPT 300 - Operating Systems I (3)
CMPT 307 - Data Structures and Algorithms (3)
CMPT 353 - Computational Data Science (3)

CMPT 354 - Database Systems I (3)
CMPT 454 - Database Systems II (3)

~~Data Science~~

~~Students complete~~
~~DATA 481 - Undergraduate Seminar in Data Science (1) †~~

Mathematics

Students complete one of

MATH 308 - Linear Optimization (3)
MATH 309 - Continuous Optimization (3)

Statistics

Students complete one of

ECON 333 - Statistical Analysis of Economic Data (4)
STAT 302 - Analysis of Experimental and Observational Data (3)
STAT 305 - Introduction to Biostatistical Methods for Health Sciences (3)
STAT 350 - Linear Models in Applied Statistics (3)

and ~~all~~ **both** of

~~STAT 341 - Introduction to Statistical Computing and Exploratory Data Analysis - R (2)~~
STAT 403 - Intermediate Sampling and Experimental Design (3)
STAT 452 - Statistical Learning and Prediction (3)

and one of

STAT 445 - Applied Multivariate Analysis (3)
STAT 475 - Applied Discrete Data Analysis (3)
STAT 485 - Applied Time Series Analysis (3)

~~† DATA 180 and DATA 481 cannot be completed concurrently~~

Students must complete 9 additional units from this list

BUS 345 - Marketing Research (4)
BUS 362 - Business Process Analysis (4)
BUS 437 - Decision Analysis in Business (3)
BUS 440 - Simulation in Management Decision-making (4)

CMPT 308 - Computability and Complexity (3)
CMPT 310 - Artificial Intelligence Survey (3)
CMPT 322W - Professional Responsibility and Ethics (3)
CMPT 373 - Software Development Methods (3)
CMPT 376W - Technical Writing and Group Dynamics (3)
CMPT 405 - Design and Analysis of Computing Algorithms (3)
CMPT 417 - Intelligent Systems (3)
CMPT 419 - Special Topics in Artificial Intelligence (3)
CMPT 470 - Web-based Information Systems (3)
MACM 316 - Numerical Analysis I (3)
MATH 343 - Applied Discrete Mathematics (3)
MATH 345 - Introduction to Graph Theory (3)
STAT 342 - Introduction to Statistical Computing and Exploratory Data Analysis - SAS (2)
STAT 445 - Applied Multivariate Analysis (3)
STAT 475 - Applied Discrete Data Analysis (3)
STAT 485 - Applied Time Series Analysis (3)

Statistics Concentration Requirements

Lower Division Requirements

Students complete a minimum of ~~58~~ **64** units.

Business Administration

Students complete all of

BUS 200 - Business Fundamentals (3)
BUS 217W - Critical Thinking in Business (3)
BUS 251 - Financial Accounting I (3)
BUS 272 - Behaviour in Organizations (3)

Computing Science

Students complete all of

CMPT 120 - Introduction to Computing Science and Programming I (3)
CMPT 125 - Introduction to Computing Science and Programming II (3)
CMPT 127 - Computing Laboratory (3)
CMPT 225 - Data Structures and Programming (3)
CMPT 276 - Introduction to Software Engineering (3)
CMPT 295 - Introduction to Computer Systems (3)

Mathematics and Computing Science

Students complete both of

MACM 101 - Discrete Mathematics I (3)
MACM 201 - Discrete Mathematics II (3)

Data Science

Students complete

DATA 180 - Undergraduate Seminar in Data Science (1)‡

Mathematics

Students complete one of

MATH 150 - Calculus I with Review (4) *
MATH 151 - Calculus I (3) *
MATH 154 - Calculus I for the Biological Sciences (3)
MATH 157 - Calculus I for the Social Sciences (3)

and all of

MATH 152 - Calculus II (3)
MATH 208W - Introduction to Operations Research (3)
MATH 251 - Calculus III (3)

and one of

MATH 232 - Applied Linear Algebra (3)
MATH 240 - Algebra I: Linear Algebra (3) *

Statistics

Students complete all of

STAT 240 - Introduction to Data Science (3)
STAT 260 - Introductory R for Data Science (2)
STAT 261 - Laboratory for Introductory R for Data Science (1)
STAT 270 - Introduction to Probability and Statistics (3)
STAT 285 - Intermediate Probability and Statistics (3)

* Recommended

† DATA 180 and DATA 481 cannot be completed concurrently

Upper Division Requirements

Students complete a minimum of ~~52~~ **49** units.

Business Administration~~, Economics~~

Students complete all of

BUS 343 - Introduction to Marketing (3)
BUS 360W - Business Communication (4)
BUS 439 - Analytics Project (3) *
BUS 445 - Customer Analytics (3) **

*For this course, Data Science students are eligible for a prerequisite waiver for BUS 345, 437, 445, 462, 464, 90 units. Students should consult with their program advisor.

**For this course, Data Science students are eligible for a prerequisite waiver for BUS 336. Students should consult with their program advisor.

Computing Science

Students complete all of

CMPT 300 - Operating Systems I (3)
CMPT 307 - Data Structures and Algorithms (3)
CMPT 353 - Computational Data Science (3)
CMPT 354 - Database Systems I (3)
CMPT 454 - Database Systems II (3)

~~Data Science~~

~~Students complete~~
~~DATA 481 - Undergraduate Seminar in Data Science (1) †~~

Mathematics

Students complete one of

MATH 308 - Linear Optimization (3)
MATH 309 - Continuous Optimization (3)

Statistics

Students complete all of

STAT 330 - Introduction to Mathematical Statistics (3)
~~STAT 341 - Introduction to Statistical Computing and Exploratory Data Analysis - R (2)~~
STAT 350 - Linear Models in Applied Statistics (3)
STAT 403 - Intermediate Sampling and Experimental Design (3)
STAT 440 - Learning from Big Data (3)
STAT 450 - Statistical Theory (3)
STAT 452 - Statistical Learning and Prediction (3)

~~† DATA 180 and DATA 481 cannot be completed concurrently~~
University Honours Degree Requirements

Students must also satisfy University degree requirements for degree completion.
Writing, Quantitative, and Breadth Requirements

Students admitted to Simon Fraser University beginning in the fall 2006 term must meet writing, quantitative and breadth requirements as part of any degree program they may undertake. See Writing, Quantitative, and Breadth Requirements for university-wide information.

WQB Graduation Requirements

A grade of C- or better is required to earn W, Q or B credit

Requirement	Units	Notes		
W - Writing	6	Must include at least one upper division course, taken at Simon Fraser University within the student's major subject		
Q - Quantitative	6	Q courses may be lower or upper division		
B - Breadth	18	Designated Breadth	Must be outside the student's major subject, and may be lower or upper division 6 units Social Sciences: B-Soc 6 units Humanities: B-Hum 6 units Sciences: B-Sci	
	6	Additional Breadth	6 units outside the student's major subject (may or may not be B-designated courses, and will likely help fulfil individual degree program requirements) Students choosing to complete a joint major, joint honours, double major, two extended minors, an extended minor and a minor, or two minors may satisfy the breadth	

			requirements (designated or not designated) with courses completed in either one or both program areas.

Residency Requirements and Transfer Credit

   At least half of the program's total units must be earned through Simon Fraser University study.
   At least two thirds of the program's total upper division units must be earned through Simon Fraser University study.

Elective Courses

In addition to the courses listed above, students should consult an academic advisor to plan the remaining required elective courses.

Double Majors and Minors

Students wishing to complete a second major or a minor in addition to a Data Science (DATA) major must satisfy all DATA requirements. At least 34 upper division units must be allocated exclusively to the DATA major.

This includes ~~DATA 481 and~~ at least nine units from each of the lists under the sub-headings Business Administration, Computing Science, Mathematics and Statistics. Units used to satisfy DATA upper division requirements beyond these 34 can be applied simultaneously to the other major, minor or honours.

SENATE COMMITTEE ON
UNDERGRADUATE STUDIES

Name of Program or Name of Faculty Data Science major
Rationale for change: STAT 341 has been replaced by STAT 260+261, so this course change is reflected in the proposed changes below. We would also like to add CMPT 295 to the required courses because, as of Spring 2021, it will be made a prerequisite for CMPT 300 (another required course for the Data Science program). References to DATA 481 has also been removed below, as this course has been discontinued.
Effective term and year: Summer 2021
The following program(s) will be affected by these changes: Data Science major (DATAMAJ)

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.**

Data Science Major Bachelor of Science The Faculty of Science, with the Departments of Statistics and Actuarial Science and of Mathematics, the Beedie School of Business, and the School of Computing Science, offers a major in Data Science (DATA) leading to a bachelor of science (BSc). This is a highly structured program providing a multidisciplinary approach to quantitative methods for business and industry in an environment of rapid changes in technology. The program is ~~managed by the Faculty of Science~~ **overseen by the Department of Statistics and Actuarial Science**. A steering committee consisting of representatives from the above mentioned departments and faculty serve as liaison between participating departments and the program director. Students formally apply to be admitted into the program. Applications can be considered both for students entering Simon Fraser University, and for students already enrolled. Admission into the program is decided on a competitive basis. Students must maintain a 2.7 cumulative grade point average (CGPA) in DATA program course work to remain in the

program and to graduate. It is strongly recommended that students contact the ~~science~~ **Statistics** advisor or program director early about admission and scheduling.

More information can be found on our website: http://www.sfu.ca/datascience.

Program Requirements

Students complete 120 units, as specified below.

Under program and University regulations, a general degree requires a total of 120 units, 44 of which are in upper division courses. Completion of all lower and upper division courses shown below is required. However, students should be aware of particular department requirements for course entry. Contact those departments for information.

Lower Division Requirements

Students complete a total of ~~52-54~~ **58-60** units.

Business Administration

Students complete all of

BUS 200 - Business Fundamentals (3)
BUS 217W - Critical Thinking in Business (3)
BUS 251 - Financial Accounting I (3)
BUS 272 - Behaviour in Organizations (3)

Computing Science

Students complete all of

CMPT 120 - Introduction to Computing Science and Programming I (3)
CMPT 125 - Introduction to Computing Science and Programming II (3)
CMPT 127 - Computing Laboratory (3)
CMPT 225 - Data Structures and Programming (3)
CMPT 276 - Introduction to Software Engineering (3)
CMPT 295 - Introduction to Computer Systems (3)

Mathematics and Computing Science

Students complete both of

MACM 101 - Discrete Mathematics I (3)

MACM 201 - Discrete Mathematics II (3)

Data Science

Students complete

DATA 180 - Undergraduate Seminar in Data Science (1)

Mathematics

Students complete one of

MATH 150 - Calculus I with Review (4)
MATH 151 - Calculus I (3)
MATH 154 - Calculus I for the Biological Sciences (3)
MATH 157 - Calculus I for the Social Sciences (3)

and both of

MATH 152 - Calculus II (3)
MATH 208W - Introduction to Operations Research (3)

and one of

MATH 232 - Applied Linear Algebra (3)
MATH 240 - Algebra I: Linear Algebra (3)

Statistics

Students complete **all of**

STAT 240 - Introduction to Data Science (3)
STAT 260 - Introductory R for Data Science (2)
STAT 261 - Laboratory for Introductory R for Data Science (1)

and one of

BUS 232 - Data and Decisions I (4)
STAT 201 - Statistics for the Life Sciences (3)
STAT 203 - Introduction to Statistics for the Social Sciences (3)
STAT 205 - Introduction to Statistics (3)
STAT 270 - Introduction to Probability and Statistics (3)

Upper Division Requirements

Students complete a minimum of ~~46-47~~ **43-44** units.

Business Administration

Students complete all of

BUS 343 - Introduction to Marketing (3)
BUS 360W - Business Communication (4)
BUS 439 - Analytics Project (3) *
BUS 445 - Customer Analytics (3) **

*For this course, Data Science students are eligible for a prerequisite waiver for BUS 345, 437, 445, 462, 464, 90 units. Students should consult with their program advisor.

**For this course, Data Science students are eligible for a prerequisite waiver for BUS 336. Students should consult with their program advisor.

Computing Science

Students complete all of

CMPT 300 - Operating Systems I (3)
CMPT 307 - Data Structures and Algorithms (3)
CMPT 353 - Computational Data Science (3)
CMPT 354 - Database Systems I (3)
CMPT 454 - Database Systems II (3)

~~Data Science~~

~~Students complete~~

~~DATA 481 - Undergraduate Seminar in Data Science (1) †~~

Mathematics

Students complete one of

MATH 308 - Linear Optimization (3)
MATH 309 - Continuous Optimization (3)

Statistics

Students complete one of

ECON 333 - Statistical Analysis of Economic Data (4)
STAT 302 - Analysis of Experimental and Observational Data (3)
STAT 305 - Introduction to Biostatistical Methods for Health Sciences (3)
STAT 350 - Linear Models in Applied Statistics (3)

and ~~all~~ **both** of

~~STAT 341 - Introduction to Statistical Computing and Exploratory Data Analysis - R (2)~~
STAT 403 - Intermediate Sampling and Experimental Design (3)
STAT 452 - Statistical Learning and Prediction (3)

and one of

STAT 445 - Applied Multivariate Analysis (3)
STAT 475 - Applied Discrete Data Analysis (3)
STAT 485 - Applied Time Series Analysis (3)

~~**For this course, Data Science students are eligible for a prerequisite waiver for BUS 336. Students should consult with their program advisor.~~

~~† DATA 180 and DATA 481 cannot be taken concurrently~~

Upper Division Recommended Courses

BUS 345 - Marketing Research (4)
BUS 362 - Business Process Analysis (4)
BUS 437 - Decision Analysis in Business (3)
BUS 440 - Simulation in Management Decision-making (4)
CMPT 308 - Computability and Complexity (3)
CMPT 310 - Artificial Intelligence Survey (3)
CMPT 322W - Professional Responsibility and Ethics (3)
CMPT 373 - Software Development Methods (3)
CMPT 376W - Technical Writing and Group Dynamics (3)
CMPT 405 - Design and Analysis of Computing Algorithms (3)
CMPT 417 - Intelligent Systems (3)
CMPT 419 - Special Topics in Artificial Intelligence (3)
CMPT 470 - Web-based Information Systems (3)
MACM 316 - Numerical Analysis I (3)

MATH 343 - Applied Discrete Mathematics (3)
MATH 345 - Introduction to Graph Theory (3)
STAT 342 - Introduction to Statistical Computing and Exploratory Data Analysis - SAS (2)
STAT 445 - Applied Multivariate Analysis (3)

STAT 475 - Applied Discrete Data Analysis (3)
STAT 485 - Applied Time Series Analysis (3)

University Degree Requirements

Students must also satisfy University degree requirements for degree completion.

Writing, Quantitative, and Breadth Requirements

Students admitted to Simon Fraser University beginning in the fall 2006 term must meet writing, quantitative and breadth requirements as part of any degree program they may undertake. See Writing, Quantitative, and Breadth Requirements for university-wide information.

WQB Graduation Requirements

A grade of C- or better is required to earn W, Q or B credit

Requirement	Units	Notes	
W - Writing	6	Must include at least one upper division course, taken at Simon Fraser University within the student's major subject	
Q - Quantitative	6	Q courses may be lower or upper division	
B - Breadth	18	Designated Breadth	Must be outside the student's major subject, and may be lower or upper division 6 units Social Sciences: B-Soc 6 units Humanities: B-Hum 6 units Sciences: B-Sci
	6	Additional Breadth	6 units outside the student's major subject (may or may not be B-designated courses, and will likely help fulfil individual degree program requirements) Students choosing to complete a joint major, joint honours, double major, two extended minors, an extended minor and a minor, or two minors may satisfy the breadth requirements (designated or not designated) with courses completed in either one or both program areas.

Residency Requirements and Transfer Credit

•   At least half of the program's total units must be earned through Simon Fraser University study.

• At least two thirds of the program's total upper division units must be earned through Simon Fraser University study.

Elective Courses

In addition to the courses listed above, students should consult an academic advisor to plan the remaining required elective courses.

Double Majors and Minors

Students wishing to complete a second major or a minor in addition to a Data Science (DATA) major must satisfy all DATA requirements. At least 34 upper division units must be allocated exclusively to the DATA major.

This includes ~~DATA 481 and~~ at least nine units from each of the lists under the sub-headings Business Administration, Computing Science, and Statistics. Units used to satisfy DATA upper division requirements beyond these 34 can be applied simultaneously to the other major, minor or honours.

| **Name of Program or Name of Faculty** |
| Statistics Honours program |

| **Rationale for change**: |
| There are two lists of upper division courses for the Statistics Honours: a list of required courses, and List A courses (from which students must complete at least 12 units). Currently STAT 300W is not included in either list. STAT 300W should be included with the required courses. |

| **Effective term and year**: |
| Summer 2021 |
| **The following program(s) will be affected by these changes:** |
| Statistics honours (STATHON) |

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 320 - Introduction to Analysis II (3)
MATH 322 - Complex Variables (3)
STAT 300W – Statistics Communication (3)
STAT 330 - Introduction to Mathematical Statistics (3)
STAT 342 - Introduction to Statistical Computing and Exploratory Data Analysis - SAS (2)
STAT 350 - Linear Models in Applied Statistics (3)
STAT 380 - Introduction to Stochastic Processes (3)
STAT 410 - Statistical Analysis of Sample Surveys (3)
STAT 430 - Statistical Design and Analysis of Experiments (3)
STAT 450 - Statistical Theory (3)
STAT 460 - Bayesian Statistics (3)
STAT 475 - Applied Discrete Data Analysis (3)

and ~~12~~ **9** units in additional upper division ACMA, MACM, MATH or STAT courses from List A below. STAT courses (STAT 360 and STAT 361 in particular) and MACM 316 are recommended.

List A

STAT 360 - Advanced R for Data Science (2)
STAT 361 - Laboratory for Advanced R for Data Science (1)

STAT 390 - Selected Topics in Probability and Statistics (3)
STAT 440 - Learning from Big Data (3)
STAT 445 - Applied Multivariate Analysis (3)
STAT 452 - Statistical Learning and Prediction (3)
STAT 485 - Applied Time Series Analysis (3)
STAT 490 - Selected Topics in Probability and Statistics (3)
STAT 495 - Directed Studies in Probability and Statistics (3)

SENATE COMMITTEE ON
UNDERGRADUATE STUDIES

| **Name of Program or Name of Faculty** |
| Statistics Major program |

| **Rationale for change**: |
| Upper division STAT courses for the Statistics major are organized into three lists: a list of required courses, List A courses, and List B courses. Currently our upper division writing course, STAT 300W, does not fall under any of these three lists, but should be included in the list of required courses. |

| **Effective term and year**: |
| Summer 2021 |
| **The following program(s) will be affected by these changes:** |
| Statistics major (STATMAJ) |

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
STAT 300W – Statistics Communication (3)
STAT 330 - Introduction to Mathematical Statistics (3)
STAT 342 - Introduction to Statistical Computing and Exploratory Data Analysis - SAS (2)
STAT 350 - Linear Models in Applied Statistics (3)

and ~~15~~ **12** units in upper division STAT courses from Lists A and B (including a minimum of two courses from List A)

and 9 units in additional upper division ACMA, MACM, MATH or STAT courses from Lists A and B. STAT courses (STAT 360 and STAT 361 in particular) and MACM 316 are recommended.

List A

STAT 380 - Introduction to Stochastic Processes (3)
STAT 390 - Selected Topics in Probability and Statistics (3)
STAT 410 - Statistical Analysis of Sample Surveys (3)
STAT 430 - Statistical Design and Analysis of Experiments (3)
STAT 440 - Learning from Big Data (3)
STAT 450 - Statistical Theory (3)
STAT 460 - Bayesian Statistics (3)

STAT 490 - Selected Topics in Probability and Statistics (3)
STAT 495 - Directed Studies in Probability and Statistics (3)

List B

STAT 360 - Advanced R for Data Science (2)
STAT 361 - Laboratory for Advanced R for Data Science (1)
STAT 445 - Applied Multivariate Analysis (3)
STAT 452 - Statistical Learning and Prediction (3)
STAT 475 - Applied Discrete Data Analysis (3)
STAT 485 - Applied Time Series Analysis (3)

For students who wish to seek accreditation with the Statistical Society of Canada, STAT 450 and at least one of STAT 410 or STAT 430 are recommended.