

Faculty of Pure and Applied Science - York Campus

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I. Degree and Certificate Programmes

Graduate Degree Programmes

Science at York University involves not only the undergraduate programmes described in this Calendar, but also graduate programmes leading to the MSc (Master of Science) and PhD (Doctor of Philosophy) degrees, which may be taken in Biology, Chemistry, Computer Science, Earth and Space Science, Kinesiology and Health Science (MSc only), Geography, and Physics and Astronomy. York University scientists teach at both levels, graduate and undergraduate, and act as academic advisors to students. They also engage in active research, both theoretical and experimental, in a wide variety of areas of science, including astrophysics, atomic and molecular physics, particle physics, laser research, atmosphere studies, geophysics, synthetic chemistry, ecology, invertebrate endocrinology, molecular and cell biology, exercise physiology, biogeography, hydrology, artificial intelligence, and parallel and scientific computation.

Undergraduate Degree Programmes

HONOURS BSc PROGRAMMES, which are usually completed in four years of full-time study, require at least 120 credits and may involve varying degrees of concentration in one or two declared subject areas:

- **Specialized Honours** with one declared major in Applied Mathematics, Biology, Chemistry, Computer Science, Earth and Atmospheric Science, Environmental Science, Geography, Kinesiology and Health Science, Mathematics, Physics and Astronomy, Psychology or Statistics;
- **Honours Double Major** (intra-Faculty; formerly Combined Honours - before 1999/2000) with declared Science majors in two of Applied Mathematics, Biology, Chemistry, Computer Science, Earth and Atmospheric Science, Geography (in combination with Earth and Atmospheric Science only), Kinesiology and Health Science, Mathematics, Physics and Astronomy, Psychology, Statistics; (*Note: Some combinations may require more than 120 credits.*)
- **Honours Double Major** (Science/Arts inter-Faculty) with a declared Science major in Earth and Atmospheric Science or Physics and Astronomy; and a declared Arts major in one of Anthropology; Classical Studies; Classics; East Asian Studies; Economics; English; French Studies; German; Greek; History; Humanities; Italian; Latin; Linguistics; Philosophy; Political Science; Religious Studies; Russian; Science, Technology, Culture and Society; Sociology; Spanish; Women's Studies; (*Note: Choice of major and minor is subject to timetabling constraints. Some combinations may require more than 120 credits.*)
- **Honours Major/Minor** (intra-Faculty) with a declared Science major in one of Applied Mathematics, Biology, Chemistry, Computer Science, Earth and Atmospheric Science, Kinesiology and Health Science, Mathematics, Physics and Astronomy, Psychology; and a declared Science minor in one of Applied Mathematics, Biology, Chemistry, Computer Science, Earth and Atmospheric Science, Kinesiology and Health Science, Mathematics, Physics and Astronomy, Psychology; (*Note: Major/minor combinations with the major and minor in the same subject area are not permitted.*)
- **Honours Major/Minor** (Science/Arts inter-Faculty) with a declared Science major in one of Biology, Chemistry, Earth and Atmospheric Science, Physics and Astronomy; and a declared Arts minor in one

of Anthropology, Classical Studies, Classics, East Asian Studies, Economics, English, French Studies, German, Greek, History, Humanities, Italian, Latin, Linguistics, Philosophy, Political Science, Religious Studies, Russian, Sociology, Spanish, Women's Studies; (*Note: Choice of major and minor is subject to timetabling constraints.*)

- **Honours Major/Minor** (Science/Environmental Studies inter-Faculty) with a declared Science major in one of Biology, Chemistry, Earth and Atmospheric Science, Physics and Astronomy; and a declared minor in Environmental Studies;
- **Honours Major/Minor** (Science/Fine Arts inter-Faculty) with a declared Science major in one of Biology, Chemistry, Computer Science, Earth and Atmospheric Science, Kinesiology and Health Science, Mathematics, Physics and Astronomy; and a declared Fine Arts minor in one of Dance, Film and Video, Fine Arts Cultural Studies, Music, Theatre, Visual Arts; (*Note: Choice of major and minor is subject to timetabling constraints.*)
- **Honours Science** with no declared major, for the student who wishes to enrol in a broader range of courses at the 3000 and 4000 levels than can normally be undertaken in Specialized Honours, Honours Double Major or Honours Major/Minor programmes.

ORDINARY BSc PROGRAMMES, which are usually completed in three years of full-time study, require at least 90 credits and usually involve limited concentration in only one declared subject area:

- **Ordinary** with one declared major in Applied Mathematics, Biology, Chemistry, Computer Science, Earth and Atmospheric Science, Geography, Mathematics, Physics and Astronomy, Psychology or Statistics;
- **Ordinary in General Science** with no declared major, open only to Science students co-registered in the Faculty of Education Junior-Intermediate Programme who are declaring Science as their teaching subject.

Joint Study Programmes

Science and Arts

The Faculty of Pure and Applied Science and the Faculty of Arts jointly offer Honours Double Major and Honours Major/Minor programmes where the major is from one Faculty and the second major or the minor from the other Faculty.

A student in the Faculty of Pure and Applied Science who has completed 24 credits in a BSc programme and satisfies the Faculty of Pure and Applied Science academic standards to proceed in Honours may combine the study of a Science major and an Arts major or minor in an Honours Double Major or Honours Major/Minor BSc programme. Corresponding programmes involving an Arts major and a Science major or minor lead to BA Honours Double Major or Honours Major/Minor degrees in the Faculty of Arts. All Honours programmes require a minimum of 120 credits which can normally be completed in four years of full-time study.

For a list of possible subject combinations for the BSc degree programmes, see "Undergraduate Degree Programmes" above. For the details of the Science major and minor requirements for specific subject areas, see Science section V. For the details of specific Arts major and minor requirements and for the requirements for Honours BA programmes, see "Programmes of Study" in the Faculty of Arts section of this Calendar.

Science and Education

A student wishing to obtain the professional certification required to teach in Ontario schools may take both teacher training and an undergraduate academic programme concurrently. This does not shorten the time required to gain the qualification but provides a better chance for the student to relate theory and practice and to have more opportunity to gain practical experience than is possible in a one-year programme.

A student in Science who has completed a first-year BSc programme with an overall standing of at least C+ may apply to co-register in the Faculty of Education. A co-registered student normally takes one and a half or two full courses in the Faculty of Education in an academic year concurrent with courses for the BSc. The specific study programme of each student is subject to the approval of both Faculties.

Upon successful completion of the course requirements for a BSc in an Honours or an Ordinary programme, and of the required education courses, a co-registered student is awarded a BSc and a BEd.

To provide a broad background in biology, chemistry and physics for Science teachers in the Junior-Intermediate Division (Ontario Grades 4-10), the Faculty of Pure and Applied Science offers an Ordinary BSc degree in General Science. This degree programme is open only to Science students who are co-registered in the Faculty of Education Junior-Intermediate Programme and are declaring Science as their teaching subject. For specific degree requirements, see Science section V.

Science and Environmental Studies

The Faculty of Pure and Applied Science and the Faculty of Environmental Studies jointly offer Honours Major/Minor programmes where the major is from one Faculty and the minor from the other Faculty.

A student in the Faculty of Pure and Applied Science who has completed 24 credits in a BSc programme and satisfies the Faculty of Pure and Applied Science academic standards to proceed in Honours may combine the study of a Science major and an Environmental Studies minor in an Honours Major/Minor BSc degree programme. A corresponding programme including a major in Environmental Studies and a Science minor leads to an Honours Major/Minor BES degree in the Faculty of Environmental Studies. Both programmes require a minimum of 120 credits which can normally be completed in four years of full-time study.

For a list of possible Science majors for the BSc degree programme, see "Undergraduate Degree Programmes" above. For details of the Science major and minor requirements in specific subject areas, see Science section V. For details of the requirements for a minor in Environmental Studies within the BSc degree programme, and for the requirements for Honours BES programmes, see "Degree Requirements" in the Faculty of Environmental Studies section of the this Calendar.

Science and Fine Arts

The Faculty of Pure and Applied Science and the Faculty of Fine Arts jointly offer Honours Major/Minor programmes where the major is from one Faculty and the minor is from the other Faculty.

A student in the Faculty of Pure and Applied Science who has completed 24 credits in a BSc programme and satisfies the Faculty of Pure and Applied Science academic standards to proceed in Honours may combine the study of a Science major and a Fine Arts minor in an Honours Major/Minor BSc degree programme. A corresponding programme including a Fine Arts major and a Science minor leads to an Honours Major/Minor BA or BFA degree in the Faculty of Fine Arts. All Honours programmes require a minimum of 120 credits which can normally be completed in four years of full-time study.

For a list of possible subject combinations for the BSc degree programme, see "Undergraduate Degree Programmes" above. For details of the Science major and minor requirements in specific subject areas, see Science section V. For details of the Fine Arts minor and major requirements in specific subject areas, and for the requirements for Fine Arts Honours BA and BFA degree programmes, see "Degree Requirements" and "Programmes of Study" in the Faculty of Fine Arts section of this Calendar.

Science (Psychology) and Rehabilitation Services

The Department of Psychology of York University and the Continuing Education Division of Seneca College of Applied Arts and Technology jointly offer a two-year certificate programme in Rehabilitation Services. This programme combines the last 30 credits for a York BSc (or BA) in Psychology with appropriate courses in rehabilitation services offered by Seneca College and 800 hours of supervised field placement. For more information, see below under "Certificate Programmes."

Certificate Programmes

All undergraduate certificate programmes are open to all undergraduate students, subject to student eligibility and course availability. The following certificates are offered by departments affiliated with the Faculty of Pure and Applied Science and can be taken concurrently with a BSc degree programme.

Certificate in Coaching

Candidates registered in BSc programmes who satisfy the certificate programme admission requirements may work towards a Certificate in Coaching. Candidates majoring in Kinesiology and Health Science normally do this concurrently with their BSc studies by enrolling in the Applied Certificate Stream of Specialized Honours - see the Kinesiology and Health Science programme requirements in Science section V. Certificate programme admission requirements are publicized and administered by the School of Physical Education.

Certificate in Fitness Assessment and Exercise Counselling

Registered BSc candidates and Special Students who satisfy the certificate programme admission requirements may work towards a Certificate in Fitness Assessment and Exercise Counselling offered by the School of Physical Education. Candidates majoring in Kinesiology and Health Science normally do this concurrently with their BSc studies by enrolling in the Applied Certificate Stream of Specialized Honours - see the Kinesiology and Health Science programme requirements in Science section V. Certificate programme admission requirements are publicized and administered by the School of Physical Education.

Certificate in Geographic Information Systems (GIS) and Remote Sensing

Registered BSc candidates and Special Students who satisfy the certificate programme admission requirements may work towards a Certificate in Geographic Information Systems (GIS) and Remote Sensing, offered jointly by the Earth and Atmospheric Science Department of the Faculty of Pure and Applied Science, the Geography Department of the Faculty of Arts, and the Faculty of Environmental Studies. The certificate programme includes three streams, one offered through each of the three units above. BSc candidates majoring in Earth and Atmospheric Science or Geography can work concurrently towards the certificate and a BSc degree. For further details, consult one of the units mentioned above.

Certificate in Meteorology

Registered BSc candidates and Special Students who are interested in careers in atmospheric science (meteorology) and who satisfy the certificate programme admission requirements may work towards a Certificate in Meteorology offered by the Department of Earth and Atmospheric Science. Normally, a student registered in the Atmospheric Science Stream of the department works concurrently towards a certificate and a BSc degree. However, the programme is open to any student who satisfies the programme admission requirements. Entrance to the programme requires the candidate to have successfully completed at least 54 approved credits (nine approved full courses) in the areas of physical science and mathematics. To receive a certificate a student must attain a credit-weighted grade-point average of 4.0 or better over the 30 credits taken for the certificate. Further details on the Certificate in Meteorology Programme are available from the Department of Earth and Atmospheric Science.

Certificate in Rehabilitation Services

Registered BSc candidates in Psychology who are interested in rehabilitation services and who satisfy the certificate programme admission requirements stated below may work toward a Joint York/Seneca Certificate in Rehabilitation Services concurrently with their final 30 credits for a York University BSc (Ordinary or Specialized Honours) in Psychology. A full-time student will normally require four years to complete the certificate and an Ordinary BSc in Psychology or five years for the certificate and a Specialized Honours BSc in Psychology.

Certificate admission requirements for BSc candidates include the following:

1. a minimum credit-weighted grade-point average of 5.0 over 60 credits (towards an Ordinary BSc in Psychology) or 90 credits (towards a Specialized Honours BSc in Psychology), including SC/PSYC 1010 6.0 with a minimum grade of C;
2. emotional stability and a strong interest in working with individuals with disabilities;
3. previous employment or volunteer work in the field of rehabilitation.

Interested students should apply to the Programme Coordinator in the Department of Psychology by March of the year in which they expect to complete the admission requirements.

Candidates will complete their BSc requirements by taking SC/PSYC 2130 3.0, SC/PSYC 2230 3.0, SC/PSYC 3140 3.0, AS/PSYC 3430 3.0, AS/SOCI3820 6.0, SC/PSYC 4030 6.0, and SC/PSYC 4060 6.0, as required for the certificate. In addition, the certificate will require specific Seneca courses and 800 hours (the equivalent of two full days per week for two years) of supervised field placement. Specialized Honours BSc candidates should take 6 credits from the above courses (preferably SC/PSYC 2130 3.0 and either SC/PSYC 2230 3.0 or SC/PSYC 3140 3.0) before entering the programme to allow time for SC/PSYC 4000 6.0 or SC/PSYC 4170 6.0 (either one of these courses is required for a Specialized Honours degree in Psychology).

For more information, students should consult the Department of Psychology supplemental calendar or the York/Seneca Rehabilitation Services Programme Coordinator in the Department of Psychology.

Certificate in Sport Administration

Candidates registered in BSc programmes who meet the certificate programme admission requirements may work towards a Certificate in Sport Administration. Candidates majoring in Kinesiology and Health Science normally do this by taking the courses required for the certificate as non-science electives within their BSc degree programme. More than 120 credits may be required to complete both the certificate and the BSc degree requirements. For admission requirements and additional information, consult the School of Physical Education.

Certificate in Sport Therapy

Candidates registered in BSc programmes who are interested in the field of athletic injury prevention, management and therapy and who meet the certificate programme admission requirements may work towards a Certificate in Sport Therapy. Candidates majoring in Kinesiology and Health Science normally do this concurrently with their BSc studies by enrolling in the Applied Certificate Stream of Specialized Honours - see the Kinesiology and Health Science programme requirements in Science section V. The certificate requires specific courses offered by the School of Physical Education plus extensive practical and clinical field placement experience. It will satisfy many of the requirements for those who plan to subsequently seek certification by the Canadian Athletic Therapists Association and/or the National Athletic Trainers' Association (USA). For admission requirements and additional information, consult the School of Physical Education.

II. Advising, Enrolment, Registration, Graduation, and Other Administrative Procedures

Student Responsibility

Every effort is made in the Faculty of Pure and Applied Science to ensure that each student receives academic advice and sufficient information to guide in course selection and programme choice. Within this context, the student is solely responsible for the following:

- ensuring that the courses chosen in consultation with an advisor meet all programme (refer to Science section V) and degree (refer to Science section IV) requirements for graduation;
- verifying the accuracy of registration records, including all course changes;
- fulfilling the requirements and being aware of academic progress in all registered courses;
- noting and abiding by the sessional deadline dates published in the Lecture Schedules each year, especially course change deadline dates.

Advising

Before each academic session begins, every Science student can meet with an advisor to discuss programme and degree requirements. However, it is the responsibility of all students to familiarize themselves with both the

requirements of their individual programmes of study (refer to Science section V) and the regulations governing their BSc degree requirements (refer to Science section IV).

In preparation for enrolment, and at the advising appointment, the following should be considered.

- **choice of subject area(s).** Every student must choose one or two subject area(s) according to personal interests and career goals. First-year students must do this at the time of their advising appointment.
- **choice of programme.** All students who have completed 24 or more credits must choose a programme (Ordinary, Specialized Honours, Honours Double Major or Honours Major/Minor) in accordance with general regulation 3 in Science section IV. Minimum grade-point average requirements for Honours programmes are detailed under "Academic Standards for BSc Programmes" in Science section III and in the programme of study requirements in Science section V. See also "Designation of Honours or Ordinary Programme" in Science section III.
- **Faculty BSc degree requirements and regulations.** Refer to Science section IV.
- **course selection at the 1000 level.** For first-year students, the 1000-level (entry-level) BSc programme is a multi-disciplinary one. Students take introductory courses, consistent with their levels of background preparation, which are planned to prepare them well for more advanced study in the subject areas of their choice. Most introductory courses carry prerequisites, normally at the OAC level.

The course requirements at the 1000 level are governed by Faculty general regulation 4 (Science section IV) and are outlined in item ii) under the programme of study requirements for each subject area and applied science stream in Science section V. These Faculty regulations ensure that students' choices from the roster of introductory offerings provide an adequate and appropriate breadth in science, help students to develop basic computational, mathematical and laboratory skills, and also an appreciation of the humanities and social sciences.

Unless stated otherwise in the programme of study requirements in Science section V, Combined Honours candidates are expected to complete all 1000-level requirements for both majors, excepting degree credit exclusions.

Since the normal yearly full-time credit load is 30 credits, it will not be possible for the student to complete all the 1000-level requirements for any BSc programme in Year 1. Certain specific courses should be taken in Year 1 as prerequisites for required 2000-level courses or as an introduction to the major or minor subject area. It is advisable to complete as many of the other required 1000-level Science courses as possible in Year 1 to avoid timetable conflicts in later years.

In some circumstances, equivalent courses approved in writing by the major programme(s) may be substituted for the courses listed.

- **course selection above the 1000 level.** Complete details of the course requirements for all BSc subject areas and programmes are found in Science section V. Degree checklists for all BSc programmes/subject areas are available from the Office of Science Academic Services.
- **prerequisites/corequisites.** Most Science courses have prerequisite and/or corequisite requirements. These may be specific courses (indicating specific required background knowledge) or they may be general prerequisites (indicating a required level of maturity in university studies in the subject area or overall).

As indicated in general regulation 2 in Science section IV, it is the student's responsibility to enrol in only those courses for which the student has successfully completed all designated prerequisites and to take concurrently all specified corequisites not already completed successfully. Students who lack the stated prerequisites but have reason to believe that they can succeed in a course must obtain written permission of the department concerned (consult the departmental undergraduate office regarding the procedure to be followed) before enrolling.

- **degree credit exclusions.** Students should avoid enrolling in any two courses which are designated as degree credit exclusions of one another, since, in the Faculty of Pure and Applied Science, **degree credit will be given for only one.** For more information regarding degree credit exclusions, see "Degree Credit Exclusions" in Science section IV.
- **scheduling.** All information regarding courses to be offered in each session, times, places, etc., is found in the York University Lecture Schedule, a separate publication.

Enrolment

Students enrol in courses offered by the Faculty of Pure and Applied Science via the Voice Response Enrolment System. Access to the Voice Response Enrolment System is granted to newly admitted students only after the advising document has been signed. Information on how to use this telephone enrolment system is provided in the Lecture Schedule.

Advanced Standing

Advanced standing credit towards a York University BSc may be granted for courses taken at other accredited post-secondary institutions prior to registration at York University.

Advanced standing assessments for the Faculty of Pure and Applied Science are specific to the programme and subject area(s) in which the student plans to enrol at York University. If the student does not enrol in the programme(s) and subject area(s) specified on the admission application or, subsequent to first registration, changes subject area(s) and/or programme(s), the advanced standing must be reassessed.

Faculty of Pure and Applied Science policy regarding courses failed at another accredited post-secondary institution is outlined under "Failures" in Science section III.

Faculty Transfers

Students from other Faculties at York University who wish to apply to transfer into the Faculty of Pure and Applied Science must apply to the Registrar's Office, no later than June 30 for Fall Term admission.

Changes in Programme/Subject Area(s)

Candidates may change their degree programmes and/or subject area(s) from the time of their advising sessions in the spring until the tenth class day of the Fall Term, provided their standing, prescription of studies and timetable arrangements permit the proposed changes, and provided they are supported in writing by the academic advisors concerned. All programme and subject area changes must be effected through the Registrar's Office by completion of the relevant form, signed by the new department(s). Advanced standing assessments must be reviewed after any change in programme/subject area.

Course Changes

Course changes are permitted, but only for limited periods of time, and in accordance with the sessional dates in the Lecture Schedules. Written permission of the course instructor(s) may be required. Students should consult their advisors regarding the effect course changes may have on the fulfilment of programme and degree requirements, but it is the responsibility of the student alone to recognize the consequences of course changes on academic progress. Students are responsible for verifying their enrolment during each academic session.

Courses Taken Outside the Faculty / Letters of Permission

A maximum of 12 credits in total may be taken during a Summer Session at York University and/or at another institution, a maximum of 33 credits during a Fall/Winter Session.

Students should note that some departments have specific limits on the number of out-of-department or out-of-Faculty courses which may be taken for credit towards a BSc.

York University

The student is responsible for ensuring that courses taken in another Faculty at York University fulfil programme and degree requirements, are

eligible for BSc credit, and observe prerequisite, corequisite and degree credit exclusion restrictions. Information regarding Atkinson College courses can be found in the Faculty of Pure and Applied Science Degree Credit Exclusion/Equivalent Tables in the back of the Lecture Schedule or posted outside the Office of Science Academic Services after March 1 each year.

Other Institutions

A student wishing to take a course at an external accredited institution at any time for credit towards a York University BSc is required to obtain a letter of permission from York University prior to taking the course.

Request forms for letters of permission are available from the Office of the Registrar. The letter of permission request form, with course description(s), must be submitted to the appropriate departmental office to have the course(s) assessed for equivalents/exclusions. The completed form must then be returned to the Office of the Registrar.

At the conclusion of the session for which a letter of permission was granted, the student must arrange for the host institution to submit either an official transcript for consideration for transfer credit, or official notice of withdrawal/non-enrolment to the Office of the Registrar.

The student must obtain a grade of C or higher in the course for which a letter of permission has been granted in order to receive credit for the course in the Faculty of Pure and Applied Science. Passed courses as well as failed courses completed on letters of permission are included in the student's cumulative record, although grades from such courses are not listed on York University transcripts and are not included in the calculation of York grade-point averages.

Reactivation

A student who has been absent from the University for one or more session(s) must apply to the Office of the Registrar to be reactivated. For Fall Term and full Fall/Winter Session courses, the deadline is June 30. *(Note: This does not apply to students who have failed to gain standing or have been debarred from York University or to students who have taken post-secondary courses at another institution during their absence from York University; all such students must apply, through the Admissions Office, to be re-admitted to York University.)*

Graduation

Students should apply to graduate in the calendar year in which they expect to qualify for the BSc degree, irrespective of whether or not they plan to attend the graduation ceremony. The application to graduate form can be obtained from the Office of the Registrar or can be found in the back of the Lecture Schedule.

The deadline dates for spring and fall graduation ensure that all potential graduates' records are assessed with care. No late applications are accepted for any reason.

A student registered in an Honours programme may apply to graduate with an Ordinary degree, provided programme requirements are met.

Degree Reclassification

A student who has completed a York University Ordinary BSc degree in the Faculty of Pure and Applied Science may continue, after graduation, in a Specialized Honours programme in the same subject area or in an Honours Double Major or Honours Major/Minor programme including the same subject area, provided the grade-point average is that required for the Honours programme.

A student who has completed an Honours Double Major or Honours Major/Minor BSc degree may apply for admission to a Specialized Honours BSc programme in one of the (Science) subject areas included in the Honours Double Major or Honours Major/Minor degree. Applications for this reclassification are available from the Registrar's Office.

A student who wishes to pursue a second BSc in a different field of study must apply to the Admissions Office for admission as a second degree candidate. The deadline to apply for fall admission is June 1.

III. Regulations Governing Examinations and Academic Standards

Grading System

Refer to the Grades and Grading Schemes section of this Calendar.

Pass/Fail Grading Option

A pass/fail grading option is available to Faculty of Pure and Applied Science students under the following guidelines.

Academic Standing. This option is available only to students who are in good standing (i.e., not under academic or debarment warning).

Minimum Number of Courses Completed. Students must have successfully completed at least 24 credits before they may apply to take a course under this option.

Elective Courses Only. The following types of courses may not be taken on a pass/fail basis: courses in the major and minor subject area(s), general education courses, 1000-level Science courses required to satisfy the Faculty of Pure and Applied Science general regulation 4 (Science section IV), non-major courses required to satisfy programme requirements.

Maximum Number of Pass/Fail Credits.

- Honours Programme: a maximum of 12 (passed) credits from pass/fail graded courses may be counted towards an Honours BSc degree.
- Ordinary Programme: a maximum of 6 (passed) credits from pass/fail graded courses may be counted towards an Ordinary BSc degree.

Totals of Credits Failed and Taken. Credits failed in pass/fail graded courses count towards the overall total of credits failed. Both credits passed and credits failed in pass/fail graded courses count towards the overall total of credits taken. The totals of credits failed and credits taken are used to determine a student's status regarding academic warning and failure to gain standing.

Grade-Point Average Calculations. The grade obtained (passed or failed) in a pass/fail graded course is not included in grade-point average calculations in the Faculty of Pure and Applied Science.

Deadline to Select Pass/Fail Option. Eligible students may exercise the option within the first two weeks (10 class days) of the term in which the course begins. They must obtain the signature of the course director on a form to be made available from, and returned to, the Office of the Registrar.

Deadline to Change from Pass/Fail back to the Letter-Grade System. At the student's request, the student may change the designation of a course from pass/fail back to the letter-grade system until the last day for withdrawal without academic penalty from the term in which the course is offered. Formal notification, with the student's and course director's signatures, must be received by the Office of the Registrar by this deadline.

Repeated Courses

Students are allowed to retake a failed course once for academic degree or certificate credit. Students are allowed to retake a passed course once for academic degree or certificate credit, only if the student has failed to achieve sufficient standing to proceed in a core or prerequisite course in a degree or certificate programme and if no alternative remedies are provided (e.g., alternative qualifying examination). Students should note that course availability and space considerations may preclude the possibility of repeating a course in the session they choose.

When a student is allowed to repeat a course for academic degree or certificate credit, both grades are counted in the grade-point average. A course can be credited only once towards satisfaction of degree or certificate academic credit requirements.

Failed or passed courses which are repeated are included on the transcript with the original grade. Courses which have been repeated have the notation "NCR" (no credit retained).

Academic Standards for BSc Programmes

Honours BSc Programmes

To declare Honours requires successful completion of at least 24 credits and a minimum cumulative credit-weighted grade-point average of 5.0* over all Science (SC) courses completed.

To proceed in each year of an Honours BSc programme requires a minimum cumulative credit-weighted grade-point average of 5.0* over all Science (SC) courses completed.

To graduate in an Honours BSc programme requires successful completion of all Faculty requirements and departmental required courses and a minimum cumulative credit-weighted grade-point average of 5.0* over all Science (SC) courses completed. For students admitted to York University for 1999/2000 and subsequent years, the Senate of York University will require a minimum overall grade-point average of 5.0 in order to be eligible to graduate in an undergraduate Honours degree programme.

* *Note: Some programmes may require a higher standard - consult the programme of study requirements in Science section V.*

Ordinary BSc Programmes

To graduate in Ordinary. For students admitted to York University for 1999/2000 and subsequent years, the Senate of York University will require a minimum overall grade-point average of 4.0 in order to be eligible to graduate in an undergraduate Ordinary degree programme.

Designation of Honours or Ordinary Programme

Automatic Honours Designation. Students are automatically considered to be in an Honours programme provided they achieve and maintain the minimum grade requirements for Honours described under "Academic Standards for BSc Programmes" above.

Automatic Ordinary Designation. Students are automatically considered to be in an Ordinary programme if they fail to achieve or maintain the minimum grade requirements for Honours described under "Academic Standards for BSc Programmes" above.

Option to Graduate with an Ordinary Degree. Students registered for an Honours degree may opt to graduate with an Ordinary degree if they fulfill programme requirements. See "Graduation" in Science section II for details.

Examinations

Most courses in the Faculty of Pure and Applied Science schedule three-hour final examinations. Examinations are scheduled during day and evening hours.

Students are admitted to the examination hall five minutes before the scheduled start-time and are required to present their sessional identification cards and photo identification cards when writing final examinations. Unauthorized aids may not be taken into the examination halls. No student may leave the examination hall within 15 minutes of the end of the scheduled examination period. All students must remain seated at the conclusion of the examination period until all examination answer sheets/booklets have been collected by the invigilators. Examination booklets, used and unused, must be submitted intact, with no insertions and no pages removed.

A student observed deriving assistance from any unauthorized source is subject to the procedures and penalties defined under the Senate regulations regarding academic honesty (see the "University Policies and Regulations" section of this Calendar).

Students must maintain a standard of work in their courses of instruction satisfactory to the departments or divisions concerned, and must attend the required examinations, unless prevented by illness or by some other special circumstance.

A student who writes a final examination under duress, or who is prevented from attending an examination by illness or by some other special circumstance, must file a petition for a deferred examination within the stated time limits and provide appropriate written evidence for consideration (see "Deferred Examinations" below).

Final examination answer sheets/booklets become the property of the teaching unit. Students have the right to review their graded tests and examinations.

Deferred Examinations / Aegrotat Standing

A student must file a petition for the granting of aegrotat standing or permission to write deferred examinations, in respect of final examinations only, on the grounds of sickness or misfortune. The petition application, together with other written evidence to be taken into consideration, must be submitted to the Registrar's Office according to the following deadline dates: Fall/Winter Session: January 15 for Fall Term examinations, May 15 for Winter Term examinations; Summer Session: June 30 for first term examinations, August 26 for second term examinations.

A petition submitted on grounds of illness must include the "Attending Physician's Statement" completed by the petitioner's physician.

Aegrotat standing is seldom granted in respect of final examinations; instead, the student may be granted permission to write deferred examination(s), normally in July.

Term Work

All final grades, including those assigned after deferred examinations, are calculated in a way which assigns a specific weighting to the term work done in addition to the final (or deferred) examination. The weighting is set by the course director and must be announced and available in writing within the first two weeks of classes. If possible, information about assignments and grades for all courses should be made known to students at or before the first class meeting.

Some graded feedback worth at least 20 percent of the final grade is received by students in all courses (excepting those senior undergraduate courses, such as honours theses, where course work consists of a single piece of work) prior to the final date to withdraw from a course without receiving a grade. Students who, in the absence of recognized extenuating circumstances, fail to complete such course work cannot use the lack of feedback as grounds for withdrawal [subject to Senate approval].

The total value of any in-class test(s) or in-class examination(s) given in the last two weeks of classes in a term cannot be greater than 20 percent of the final mark for the course.

Term work in any course may not be submitted later than the first day of the final examination period for the course. Earlier final dates for the submission of term work may be set at the discretion of the department/division concerned.

The student is responsible for ensuring that all written term work is received by the instructor concerned.

Reappraisal of Final Grades

Examination scripts and class records of students are carefully assessed, especially in marginal cases, and there is little likelihood of the original standing being changed on appeal. In the case of final examinations, however, a formal written request for recalculation or reappraisal of a final grade may be made to the Office of Science Academic Services. Requests for grade reappraisals must be submitted within three weeks of the release of final grade reports in any term, and must state clearly why the student believes that the final grade deserves a higher rating. Recalculations and reappraisals are dealt with by the Chair/Director of the department/division in consultation with faculty members.

Recognition of Excellence

Dean's Honour Roll

The annual Dean's Honour Roll recognizes academic excellence by assigning the notation "Member of Dean's Honour Roll" to the grade report and transcript of a student who achieves a sessional credit-weighted grade-point average of 7.5 or higher on a minimum of 24 credits, or, in the final year of study, a minimum of 18 credits.

BSc candidates co-registered in the Faculty of Education, who are registered in a minimum of 24 credits overall (of which at least 18 credits are for the BSc) and who achieve a sessional credit-weighted grade-point average of 7.5 or higher on their BSc credits, are also eligible to be on the Faculty of Pure and Applied Science Dean's Honour Roll.

First Class Degrees

The Faculty of Pure and Applied Science rewards exceptional students by designating their BSc degrees *first class* or *first class with distinction*.

First class standing is normally awarded to students whose cumulative credit-weighted grade-point average is 7.5 or higher overall and in the Science major subject area(s).

With distinction is normally added to the *first class* BSc degree of students whose cumulative credit-weighted grade-point average is 8.0 or higher overall and in the Science major subject area(s).

Failures

In all courses of the Faculty of Pure and Applied Science, candidates may repeat once, and only once, any failed course or any course in which they may wish to improve a previously received grade of D or better. Both attempts, with both grades earned, appear on the student's official York University transcript.

Candidates who have not previously failed in a York University BSc programme are said to have failed the programme if, in the courses for which they registered, including second attempts, they (i) fail courses totalling 24 or more of the first 60 credits, or (ii) fail courses totalling 30 or more of the first 90 credits, or (iii) fail courses totalling 36 or more credits at any time. An academic warning is recorded on the candidate's grade report when the accumulated failed credits reach 12 (or fewer) short of the total which would result in failure in the programme under any of the three preceding conditions.

Candidates who have failed under (i), (ii) or (iii), above, may not register for any further courses unless they are re-admitted to the University. Applications for re-admission, not normally considered within one year from the date of failure to gain standing, should be made to the Director of Admissions.

Candidates who have already failed once in a York University BSc programme are said to have failed the programme a second time if at any time they subsequently fail an additional 12 or more credits in the courses for which they registered, including second attempts. A debarment warning is recorded on the grade reports of candidates who have failed once in a York University BSc programme.

Candidates who failed some courses at another post-secondary institution before registering in the Faculty of Pure and Applied Science at York University are judged regarding a failure in the York University BSc programme according to the Faculty of Pure and Applied Science criteria stated above, taking into consideration only those courses taken elsewhere which are applicable (or would have been applicable had they been passed) towards the specific York University BSc programme in which the student registers. This status regarding failure in the programme is included in the advanced standing statement prepared after the student is admitted to the Faculty of Pure and Applied Science.

Debarment

Candidates who have failed the programme (see "Failures" above) on two occasions are debarred from further registration or examination.

Candidates who have been debarred may be re-admitted in some subsequent session only if they give convincing evidence that they can profit from university work. Applications for re-admission are not normally entertained in less than two years from the date of debarment.

Academic Dishonesty

See the Senate regulations regarding academic honesty in the "University Policies and Regulations" section of this Calendar. For further information contact the Office of Science Academic Services.

Note: Students cannot drop any courses in which they have been penalized for a breach of academic honesty.

Petitions

Students may petition on reasonable grounds, in writing, any Faculty of Pure and Applied Science regulation. All enquiries about regulations and petition procedures should be addressed to the Office of the Registrar. For information regarding petitions for deferred examinations, see "Deferred Examinations" in this section of this Calendar. Petition forms must be submitted to the Office of the Registrar.

Normally petitions for late withdrawal from a course will only be considered if they are submitted within three weeks of the release of final grades. Such petitions may be considered for a period of up to one year if they are based on special circumstances.

Appeals Procedures

Appeals by students and/or faculty members against rulings of the Petitions Committee and/or the Committee on Examinations and Academic Standards of the Faculty of Pure and Applied Science must be filed in writing with the Secretary of the Executive and Planning Committee in the Office of the Dean, 108 Steacie, within 15 calendar days of the date of notification of the decision.

Appeals against rulings of the Petitions Committee and/or the Committee on Examinations and Academic Standing will be heard by a panel of two faculty members of the Executive and Planning Committee and one student member selected from student members of the Faculty Council. In the rare event that a decision of a panel of the Executive and Planning Committee, or of the Senate Appeals Committee, requires a completely new (*de novo*) hearing, the matter will be heard by a panel of three faculty members of the Executive and Planning Committee and one student member selected from student members of the Faculty Council. These panels will be constituted, as required, from available members, by the Secretary of the Executive and Planning Committee.

A member shall disqualify herself or himself if he or she is involved as a party or witness in the case, or believes that he or she could not be impartial. Where a member disqualifies herself or himself, the alternate member will replace him or her.

Appeals are heard only on the following grounds:

- new evidence; i.e., evidence that, through no fault of the appellant, could not reasonably have been presented at an earlier level; (As a guide, events or performance subsequent to the decisions of the Petitions Committee and/or the Committee on Examinations and Academic Standing are not to be construed as new evidence.)
- evidence of procedural irregularity in the previous consideration of the case by the Petitions Committee and/or the Committee on Examinations and Academic Standing. This may be understood to include actions taken by the Faculty of Pure and Applied Science, its officers, committees or members with respect to the case which would violate or nullify any of the following:
 - normal and written procedures of the Faculty;
 - recognized custom of the Faculty;
 - the principles of natural justice and fairness.

Students and faculty members have the right to represent themselves at appeal hearings to hear and answer allegations and to present their arguments. Appeal hearings are not open to anyone not directly involved in the case being considered. The committee's decision is taken in camera.

All appeal decisions are reported in writing to the students and the faculty members concerned, the Office of Science Academic Services, the home Faculty and the Office of the Registrar.

Further appeals may be made to the Senate Appeals Committee. Enquiries about these appeals, and the grounds upon which they may be filed, should be directed to the Senate Office, S833 Ross.

Recently approved Senate policies on petitions and grade reappraisals are posted on the York Web site at http://www.yorku.ca/admin/univsec/sen_comm/sac/index.htm. Students may contact the Office of the Registrar or their Faculty for further information.

IV. Regulations Governing BSc Degree Requirements

The Credit System

The Faculty of Pure and Applied Science operates under a credit system in which a prescribed number of credits, intended to reflect total workload, is associated with each course offered by the University. One lecture hour per week per term is defined as one credit as is one laboratory session per week per term. For York University courses (excepting some courses

offered by the Faculty of Education), the number of credits in each course is indicated by the number which follows the four-digit course number.

Year of Study Equivalents

When it is necessary to equate credits passed with year level, the following guidelines are used:

- fewer than 24 credits earned - study level 1;
- more than or equal to 24 and fewer than 54 credits earned - study level 2;
- more than or equal to 54 and fewer than 84 credits earned - study level 3;
- more than or equal to 84 credits earned - study level 4 (with the exception that Ordinary programmes never go beyond study level 3, regardless of the number of credits earned).

Residence Requirement

In order to qualify for a York University BSc degree in any Ordinary or Honours programme, a student must have successfully completed a minimum of 30 credits at York University.

Time Limit

There is no time limit for completion of BSc degree requirements in the Faculty of Pure and Applied Science. Students taking a normal full-time load of approximately 30 credits per Fall/Winter session can expect to complete an Ordinary BSc degree in three Fall/Winter sessions or an Honours BSc in four Fall/Winter sessions. A limited number of courses are also available during the Summer Session; a maximum of 12 credits can be taken in that session. Although there is no minimum number of credits in which a student must enrol in any session, students who do not enrol in any courses in a Fall/Winter session must formally apply to have their files reactivated before resuming their studies in a subsequent session (see "Reactivation" in Science section II).

Since science curriculum is constantly evolving through the introduction of new course requirements and/or prerequisites, students are strongly advised to complete their BSc degree requirements in as short a period of time as their personal circumstances and university schedules permit, in order to minimize the impact of such changes.

Degree Credit Exclusions

The University offers some courses in which at least part of the content is similar to that presented in other courses. To ensure that degree credit is not granted more than once for similar content, the Faculty of Pure and Applied Science and the Faculty of Arts designate such courses as *degree credit exclusions* (usually simply called *exclusions*). The exclusion(s) for a particular course are listed at the end of the course outline in this Calendar. (Note that the courses within such a list may not be exclusions of one another - for example, two courses may have nothing in common with each other yet may both overlap a third course.)

If a student in the Faculty of Pure and Applied Science enrolls in and successfully completes two courses which are designated as exclusions of each other, degree credit is given for only one. Both courses appear on the student's official York University transcript, and are included in grade-point average calculations (except in the case of pass/fail graded courses) and in the total number of credits taken (for determination of status regarding academic warning and failure to gain standing).

For information regarding Atkinson College courses as exclusions for Science courses in this Calendar, Science students must refer to the "Atkinson Degree Credit Exclusion/Equivalent Table for Science Students" which is available in the Office of Science Academic Services beginning in March each year or can be found in the back of the Lecture Schedule. Similar information regarding Arts courses is also included in the Lecture Schedule.

A course (or combination of courses) designated as an exclusion for another course may be substituted for the latter (for the purposes of satisfying prerequisite and/or degree requirements) only with Faculty/department/division/programme approval. Information regarding approved substitute courses may be found in the programme of study requirements in Science section V, in the prerequisite requirements listed for courses in this Calendar, in the departmental supplementary calendars, or in the

"Atkinson Degree Credit Exclusion/Equivalent Table for Science Students."

References to discontinued courses are retained in the exclusion listings in Calendar copy for only a limited number of years. Written permission of the department(s) to take both courses for credit is advisable before enrolling in a course which may overlap a discontinued course taken previously which is no longer listed as an exclusion. Such permission should be filed in the student's file in the Registrar's Office.

College Courses

Regulations governing College courses vary from Faculty to Faculty. The following regulations apply to BSc candidates:

- College courses not cross-listed with Humanities or Social Science cannot fulfil general education requirements;
- a maximum of 6 credits from 1000-level College courses may be counted towards a BSc degree.

Courses Taken Elsewhere

See "Advanced Standing" and "Courses Taken Outside the Faculty/ Letters of Permission" in Science section II.

General Education Requirements

General education courses are required within all BSc programmes. These non-science courses provide a broad perspective on current scholarship and the diversity of human experience. The courses are also expected to enhance students' critical skills in reading, writing, and thinking and contribute to their preparation for post-university life.

All BSc candidates must complete a minimum of 12 credits from two different areas of study, including at least 3 credits from each area, subject to the restrictions noted below. For the purposes of this regulation "different area" means offered by different academic units such as divisions, departments or Faculties and excluding courses offered by similar departments in different Faculties (such as English in the Faculty of Arts and Atkinson College). Subject to the restrictions listed below, courses in the following areas may be taken in the Faculty of Arts, Atkinson College or Glendon College.

- Anthropology
- Classical Studies *
- Economics
- English
- French Studies *
- Geography **
- History
- Humanities
- Languages, Literature & Linguistics *
- Philosophy
- Political Science
- Social Science
- Sociology
- Women's Studies***

The following course offered by the Faculty of Environmental Studies may be taken to satisfy Faculty of Pure and Applied Science general education requirements: ES/ENVS 1000 6.0.

The following courses offered by the Faculty of Fine Arts may be taken to satisfy Faculty of Pure and Applied Science general education requirements: FA/DANC 1340 3.0, FA/DANC 2340 3.0, FA/FILM 1400 6.0, FA/FILM 2401 6.0, FA/INFA 1900 6.0, FA/INFA 1940 6.0, FA/INFA 2900 6.0, FA/MUSI 1511 3.0, FA/MUSI 1512 3.0, FA/MUSI 1520 6.0, FA/MUSI 1530 6.0, FA/THEA 1500 6.0, FA/THEA 2210 3.0, FA/VISA 1110 6.0, FA/VISA 1340 6.0, FA/VISA 2110 6.0, FA/VISA 2540 6.0, FA/VISA 2550 6.0, FA/VISA 2560 6.0, FA/VISA 2620 6.0, FA/VISA 2680 3.0.

General education courses are normally taken at the 1000 or 2000 level, but higher-level courses are acceptable, subject only to prerequisites and course access specifications for enrolment.

Permission may be granted by the Office of Science Academic Services, on an individual basis, for a student to take a course outside the areas and Faculties listed above for general education credit, subject to the course fulfilling the Faculty of Pure and Applied Science breadth and critical skills requirements for general education courses, the student having the

appropriate prerequisites and the course access specifications permitting enrolment. A student who is in doubt regarding whether or not any specific course will fulfill the Faculty of Pure and Applied Science general education requirements should consult the Office of Science Academic Services.

Restrictions

1. Courses which are cross-listed as SC courses or which are eligible for SC credit cannot count as general education courses.
2. Courses whose major focus is increased facility in the use of a language cannot count as general education courses. Such courses are offered in the departments marked with an * above.
3. Quantitative courses focussing on techniques of mathematics or statistics cannot count as general education courses. For example, this applies to some Economics courses.
4. ** Geography courses cannot be used to satisfy general education requirements for BSc candidates majoring in Geography.
5. *** excluding Women's Studies courses which are cross-listed with Natural Science courses.

Note: General education courses may not be taken on a pass/fail basis (see "Pass/Fail Grading Option" in Science section III).

General Regulations

1. All students are required to observe the regulations of the University. Unless otherwise stated, any changes in regulations become effective as announced. This policy is not meant to disadvantage students as they proceed through their studies, including those who have completed a number of courses. It is intended to ensure that their preparation for courses is appropriate and current. Students should consult closely with departments and the Faculty through the advising process.
2. It is the student's responsibility to enrol in only those courses for which the student has successfully completed all designated prerequisites and to take concurrently all specified corequisites not already completed successfully. See also "prerequisites/corequisites" under "Advising" in Science section II.
3. All BSc degree candidates are required to indicate a choice of degree programme (Ordinary, Specialized Honours, Honours Double Major or Honours Major/Minor) upon successful completion of 24 credits. A minimum cumulative credit-weighted grade-point average of 5.0 over all Science courses completed is required for Honours programmes (see "Academic Standards for BSc Programmes" in Science section III). See also "Designation of Honours or Ordinary Programme" in Science section III. See Science section II for information about changing degree programmes.
4. All BSc degree candidates in Honours and Ordinary programmes must successfully complete the following minimum requirements, normally at the 1000 level:
 - at least 24 Science credits, excluding SC/CHEM 1500 4.0, SC/CHEM 1520 4.0, SC/MATH 1500 3.0, SC/MATH 1510 6.0, SC/MATH 1515 3.0, SC/MATH 1525 3.0, SC/PHYS 1510 4.0, and all Natural Science courses, and including at least 2 credits in introductory computer science, 6 credits in approved mathematics courses, and 12 credits in courses with laboratories;
 - 12 general education credits (see "General Education Requirements" in this section of the Calendar).
5. **Ordinary BSc Programmes.** All BSc degree candidates in all Ordinary programmes must, through registration in courses at York University or elsewhere deemed creditable towards the BSc degree,
 - a) satisfy regulations 2, 3 and 4;
 - b) present a total of at least 90 passed credits of which
 - a minimum of 66 must be earned in Science courses,
 - a minimum of 24 must be earned in one major Science subject area (except in the case of General Science),
 - a minimum of 18 must be earned in courses at the 3000 or higher level;
 - c) satisfy the Senate academic standards for Ordinary programmes - see "Academic Standards for BSc Programmes" in Science section III;

d) satisfy the programme of study requirements specified in Science section V for the Ordinary Programme declared.

6. **Honours BSc Programmes.** All candidates for the BSc degree in all Honours programmes must, through registration in courses at York University or elsewhere deemed creditable towards the BSc degree,

- a) satisfy regulations 2, 3 and 4;
- b) present a total of at least 120 passed credits of which
 - a minimum of 90 must be earned in Science courses (or a minimum of 66 for Honours Double Major or Major/Minor BSc programmes where the second major or the minor is taken in a non-science subject area),
 - a minimum of 54 must be earned in the major Science subject area (Specialized Honours BSc programmes); a minimum of 36 in (each of) the major subject area(s) (Honours Double Major and Honours Major/Minor BSc programmes); a minimum of 30 in the minor subject area (Honours Major/Minor BSc programmes),
 - a minimum of 42 must be earned in courses at the 3000 or higher level;
- c) satisfy the Faculty and Senate academic standards for Honours BSc programmes - see "Academic Standards for BSc Programmes" in Science section III;
- d) satisfy the programme of study requirements specified in Science section V for the declared Honours Programme and major and minor subject area(s).

Programmes of Study - Pure and Applied Science

V. Programmes of Study

Applied Mathematics

See *Mathematics and Statistics*.

Atmospheric Chemistry (Applied Science Streams)

The Department of Chemistry and the Department of Earth and Atmospheric Science offer degree programme streams in Atmospheric Chemistry. Both programmes of study are particularly demanding and will be of interest to students with academic performances of B grade or better.

i) All BSc degree candidates must complete the programme core (normally before proceeding to 3000- or higher-level courses): SC/CHEM 1000 6.0; SC/CHEM 2010 3.0; SC/CHEM 2011 3.0; SC/CHEM 2020 5.0; SC/CHEM 2030 4.0; SC/CHEM 2080 4.0; SC/EATS 2010 3.0; SC/MATH 2015 3.0; SC/MATH 2270 3.0.

ii) All BSc degree candidates must comply with general regulation 4 (Science section IV) by completing the following (in addition to SC/CHEM 1000 6.0 from the programme core):

- SC/COSC 1540 3.0;
- SC/EATS 1011 3.0 (Honours Double Major stream only);
- SC/MATH 1013 3.0; SC/MATH 1014 3.0; SC/MATH 1025 3.0;
- SC/PHYS 1010 6.0*;
- 12 general education credits (see "General Education Requirements" in Science section IV).

* Note: SC/PHYS 1410 6.0 with a minimum grade of C may replace SC/PHYS 1010 6.0.

iii) All BSc degree candidates, in accordance with their declared programmes, must comply with general regulation 6 (Science section IV) and, in so doing, must also satisfy the course, credit and standing requirements specified below.

Honours BSc Programmes

To declare Honours requires successful completion of at least 24 credits and a minimum cumulative credit-weighted grade-point average of 5.0 over all Science (SC) courses completed.

To proceed in each year of an Honours BSc programme requires a minimum cumulative credit-weighted grade-point average of 5.0 over all Science (SC) courses completed.

To graduate in an Honours BSc programme requires successful completion of all Faculty requirements and departmental required courses and a minimum cumulative credit-weighted grade-point average of 5.0 over all Science (SC) courses completed. For students admitted to York University for 1999/2000 and subsequent years, the Senate of York University will require a minimum overall grade-point average of 5.0 in order to be eligible to graduate in an undergraduate Honours degree programme.

Specialized Honours BSc Programme in Chemistry: Atmospheric Chemistry Stream

- the programme core, as specified in i) above;
- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above;
- SC/CHEM 3011 4.0; SC/CHEM 3020 4.0; SC/CHEM 3030 4.0; SC/CHEM 3060 3.0; SC/CHEM 3080 4.0;
- SC/EATS 3030 3.0;
- SC/CHEM 4060 4.0; SC/CHEM 4061 4.0; SC/CHEM 4100 6.0;
- 6 additional credits chosen from 3000- and 4000-level Chemistry courses or from 3000- or 4000-level Earth and Atmospheric Science courses chosen in consultation with the Department of Chemistry;
- additional elective credits as required for an overall total of at least 120 credits.

Honours Double Major BSc Programme in Chemistry and Earth and Atmospheric Science: Atmospheric Chemistry Stream

- the programme core, as specified in i) above;
- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above;
- SC/EATS 2470 4.0;
- SC/CHEM 3011 4.0; SC/CHEM 3080 4.0;
- SC/CHEM 3060 3.0 or SC/EATS 3130 3.0;
- SC/EATS 3030 3.0; SC/EATS 3040 3.0;
- SC/CHEM 4060 4.0;
- SC/CHEM 4061 4.0 or SC/EATS 4170 4.0;
- SC/CHEM 4100 3.0 or SC/EATS 4000 3.0;
- SC/EATS 4050 3.0; SC/EATS 4120 3.0;
- SC/MATH 3241 3.0;
- at least 12 additional credits (including at least 3 credits in Earth and Atmospheric Science) from the following: SC/EATS 4130 3.0, SC/EATS 4140 3.0, SC/EATS 4150 3.0, SC/EATS 4160 3.0, SC/EATS 4230 3.0, SC/CHEM 3010 4.0, SC/CHEM 3020 4.0, SC/CHEM 3021 4.0, SC/CHEM 3030 4.0, SC/CHEM 3031 4.0, SC/PHYS 2020 3.0.

Biology

i) All BSc degree candidates except those in Honours Double Major programmes must complete the programme core: SC/BIOL 1010 6.0; SC/BIOL 2010 4.0; SC/BIOL 2020 4.0; SC/BIOL 2021 4.0; SC/BIOL 2030 5.0; SC/BIOL 2040 5.0; SC/BIOL 2050 3.0; SC/CHEM 2020 5.0.

ii) All BSc degree candidates must comply with general regulation 4 (Science section IV) by completing the following (in addition to SC/BIOL 1010 6.0 from the programme core):

- SC/COSC 1520 3.0 or SC/COSC 1540 3.0;
- SC/MATH 1505 6.0, or 6 credits from SC/MATH 1013 3.0, SC/MATH 1014 3.0, SC/MATH 1025 3.0; (Note: Students intending to combine *Biology with Applied Mathematics, Chemistry, Computer Science, Earth and Atmospheric Science, Mathematics, Physics and Astronomy or Statistics should not take SC/MATH 1505 6.0.*)
- 6 credits from SC/CHEM 1000 6.0 (prerequisite for SC/BIOL 2020 4.0), SC/EATS 1010 6.0, SC/PHYS 1410 6.0 or SC/PHYS 1010 6.0;

- a minimum of 3 additional credits from BC1800 3.0, SC/CHEM 1000 6.0, SC/EATS 1010 6.0, SC/EATS 1010 3.0, SC/EATS 1011 3.0, SC/MATH 1025 3.0, SC/MATH 1190 3.0, SC/PHYS 1070 3.0, SC/PHYS 1410 6.0 or SC/PHYS 1010 6.0; (*Note: SC/PSYC 1010 6.0 may be included in this section for Honours Double Major or Honours Major/Minor combinations of Biology and Psychology.*)
- 12 general education credits (see "General Education Requirements" in Science section IV).

iii) All BSc degree candidates, in accordance with their declared programmes, must comply with general regulation 5 or 6 (Science section IV) and, in so doing, must also satisfy the course, credit and standing requirements specified below.

Ordinary BSc Programme

To graduate in Ordinary. For students admitted to York University for 1999/2000 and subsequent years, the Senate of York University will require a minimum overall grade-point average of 4.0 in order to be eligible to graduate in an undergraduate Ordinary degree programme.

- the programme core, as specified in i) above;
- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above;
- at least 15 credits from Biology courses at the 3000 or higher level, for an overall total of at least 46 credits from Biology courses;
- additional elective credits as required for an overall total of at least 90 credits, including at least 18 credits at the 3000 or higher level.

Honours BSc Programmes

To declare Honours requires successful completion of at least 24 credits and a minimum cumulative credit-weighted grade-point average of 6.0 over all Science (SC) courses completed.

To proceed in each year of an Honours BSc programme requires a minimum cumulative credit-weighted grade-point average of 6.0 over all Science (SC) courses completed.

To graduate in an Honours BSc programme requires successful completion of all Faculty requirements and departmental required courses and a minimum cumulative credit-weighted grade-point average of 6.0 over all Science (SC) courses completed. For students admitted to York University for 1999/2000 and subsequent years, the Senate of York University will require a minimum overall grade-point average of 5.0 in order to be eligible to graduate in an undergraduate Honours degree programme.

Specialized Honours BSc Programme

- the programme core, as specified in i) above;
- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above;
- SC/BIOL 3001 3.0 or SC/BIOL 3001 2.0;
- SC/BIOL 3090 3.0 (or an equivalent course in statistics - not eligible for Biology credit); SC/BIOL 3100 2.0; SC/BIOL 3200 3.0; SC/BIOL 4000 8.0 or SC/BIOL 4000 3.0;
- additional credits from Biology courses at the 3000 or higher level, as required for an overall total of at least 68 credits from Biology courses;
- additional elective credits as required for an overall total of at least 120 credits, including at least 42 credits at the 3000 or higher level.

Honours Double Major BSc Programme (formerly Combined Honours - before 1999/2000)

All BSc degree candidates should consult departmental advisors as early as possible concerning course requirements for particular Honours Double Major programmes. The following are the normal minimum requirements, but some subject combinations require more than the minimum number of Biology credits and/or specific Biology courses (consult the departmental undergraduate handbook for details). Possible subject combinations for BSc degrees are listed under "Undergraduate Degree Programmes" in Science section I.

- SC/BIOL 1010 6.0;
- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above and including courses appropriate for the second major;

- at least 13 credits from 2000-level Biology programme core courses [see i) above];
- at least 12 credits from Biology courses at the 3000 or higher level;
- additional credits from Biology courses, as required for an overall total of at least 36 credits from Biology courses;
- the course requirements for the second major;
- additional elective credits as required for an overall total of at least 120 credits, including at least 90 credits from Science courses and at least 42 credits at the 3000 or higher level.

Honours Major/Minor BSc Programme

An Honours Major in Biology may be combined with an Honours Minor in another subject area in an Honours Major/Minor BSc degree programme. Possible subject combinations for BSc degrees are listed under "Undergraduate Degree Programmes" in Science section I.

- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above and including courses appropriate for the minor;
- the Biology Honours Major requirements below;
- the course requirements for the minor;
- additional elective credits as required for an overall total of at least 120 credits, including at least 42 credits at the 3000 or higher level.

Honours Major (for Honours Major/Minor programmes)

- the programme core, as specified in i) above;
- SC/BIOL 4000 3.0 or SC/BIOL 4000 8.0;
- additional credits from Biology courses at the 3000 or higher level, as required for an overall total of at least 51 credits from Biology courses.

Note: SC/CHEM 1000 6.0 is required as a prerequisite for both SC/BIOL 2020 4.0 and SC/CHEM 2020 5.0 in the programme core.

Honours Minor

- SC/BIOL 1010 6.0;
- at least 12 credits from Biology courses at the 2000 level;
- at least 9 credits from Biology courses at the 3000 or higher level;
- additional credits from Biology courses at the 2000 or higher level, as required for an overall total of at least 30 credits from Biology courses.

Note: It is recommended that students interested in cell biology, genetics, molecular biology and biochemistry areas of Biology take the following courses: SC/BIOL 1010 6.0, SC/CHEM 1000 6.0, SC/BIOL 2020 4.0, SC/BIOL 2021 4.0, SC/BIOL 2040 5.0, and SC/CHEM 2020 5.0, plus a minimum of 9 additional credits from Biology courses at the 3000 or higher level. For other areas of interest in Biology, students are advised to choose their 2000-level Biology courses wisely, based on the prerequisites for the courses they wish to take at the 3000 or higher level. Check the course outlines in this Calendar for course prerequisites.

Chemistry

i) All BSc degree candidates (exception noted below) must complete the programme core (normally before proceeding to 3000- or higher-level courses): SC/CHEM 1000 6.0; SC/CHEM 2010 3.0; SC/CHEM 2011 3.0; SC/CHEM 2020 5.0; SC/CHEM 2030 4.0; SC/CHEM 2080 4.0 (may not be required in some Honours Double Major programmes); at least 4 credits from one of the following: SC/BIOL 2020 4.0, SC/MATH 2015 3.0 and SC/MATH 2270 3.0, SC/PHYS 2020 3.0 and SC/PHYS 2211 1.0, SC/PHYS 2060 3.0 and SC/PHYS 2211 1.0, other 2000-level Science courses authorized by the department, SC/BIOL 1010 6.0 (if not required to fulfil other degree requirements), SC/EATS 1010 6.0 (if not required to fulfil other degree requirements).

ii) All BSc degree candidates must comply with general regulation 4 (Science section IV) by completing the following (in addition to SC/CHEM 1000 6.0 from the programme core):

- SC/COSC 1540 3.0 or SC/COSC 1020 3.0 or SC/COSC 1520 3.0;
- SC/MATH 1013 3.0; SC/MATH 1014 3.0;
- SC/PHYS 1410 6.0 or SC/PHYS 1010 6.0 (not necessarily in Year 1);

- one of SC/BIOL 1010 6.0 (strongly recommended for students lacking OAC Biology), SC/EATS 1010 6.0, SC/MATH 1025 3.0; (*Note: Other 1000-level Science courses required for a second major or a minor may be acceptable in this category in Honours Double Major or Honours Major/Minor programmes.*)
 - 12 general education credits (see "General Education Requirements" in Science section IV).
- iii) All BSc degree candidates, in accordance with their declared programmes, must comply with general regulation 5 or 6 (Science section IV) and, in so doing, must also satisfy the course, credit and standing requirements specified below.

Ordinary BSc Programme

To graduate in Ordinary. For students admitted to York University for 1999/2000 and subsequent years, the Senate of York University will require a minimum overall grade-point average of 4.0 in order to be eligible to graduate in an undergraduate Ordinary degree programme.

- the programme core, as specified in i) above;
- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above;
- at least 22 credits (the equivalent of three full courses) from Chemistry courses at the 3000 level, for an overall total of at least 47 credits from Chemistry courses; (*Note: SC/CHEM 3080 4.0 is strongly advised.*)
- additional elective credits as required for an overall total of at least 90 credits.

Honours BSc Programmes

To declare Honours requires successful completion of at least 24 credits and a minimum cumulative credit-weighted grade-point average of 5.0* over all Science (SC) courses completed.

To proceed in each year of an Honours BSc programme requires a minimum cumulative credit-weighted grade-point average of 5.0* over all Science (SC) courses completed.

To graduate in an Honours BSc programme requires successful completion of all Faculty requirements and departmental required courses and a minimum cumulative credit-weighted grade-point average of 5.0* over all Science (SC) courses completed. For students admitted to York University for 1999/2000 and subsequent years, the Senate of York University will require a minimum overall grade-point average of 5.0 in order to be eligible to graduate in an undergraduate Honours degree programme.

* 6.0 for Honours Double Major with Biology.

Specialized Honours BSc Programme

- the programme core, as specified in i) above;
- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above;
- SC/CHEM 3010 4.0; SC/CHEM 3011 4.0; SC/CHEM 3020 4.0; SC/CHEM 3021 4.0; SC/CHEM 3030 4.0; SC/CHEM 3031 4.0;
- SC/CHEM 4100 6.0;
- a minimum of 12 additional credits from Chemistry courses at the 4000 level, for an overall total of at least 67 credits from Chemistry courses;
- a further 12 credits chosen in consultation with the Department of Chemistry; (*Note: SC/CHEM 3012 3.0 and SC/CHEM 3080 4.0 are strongly advised.*)
- additional elective credits as required for an overall total of at least 120 credits.

In the applied chemistry area, the Department of Chemistry offers a Specialized Honours Programme stream in **Atmospheric Chemistry** (see separate entry in Science section V).

Honours Double Major BSc Programme (formerly Combined Honours - before 1999/2000)

Possible subject combinations for BSc degrees are listed under "Undergraduate Degree Programmes" in Science section I. Information on recommended course combinations suitable for Honours Double Major programmes in Chemistry and other Science disciplines may be obtained from the department office.

Early planning of courses in an Honours Double Major Programme is strongly advised so that the necessary prerequisites for courses in both departments are met.

Honours Double Major programmes are necessarily highly demanding and should not be considered by any student without an average academic performance of B grade or better.

All Honours Double Major BSc programmes require an overall total of at least 120 credits, including at least 90 credits from Science courses and at least 42 credits at the 3000 or higher level.

In the applied chemistry area, the Department of Chemistry and the Department of Earth and Atmospheric Science offer an Honours Double Major Programme stream in **Atmospheric Chemistry** (see separate entry in Science section V).

Honours Major/Minor BSc Programme

An Honours Major in Chemistry may be combined with an Honours Minor in another subject area in an Honours Major/Minor BSc degree programme. Possible subject combinations for BSc degrees are listed under "Undergraduate Degree Programmes" in Science section I.

- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above and including courses appropriate for the minor;
- the Chemistry Honours Major requirements below;
- the course requirements for the minor;
- additional elective credits as required for an overall total of at least 120 credits, including at least 42 credits at the 3000 or higher level.

Honours Major (for Honours Major/Minor programmes)

- the Chemistry courses in the programme core, as specified in i) above;
- a minimum of 22 credits from Chemistry courses at the 3000 or higher level, including a minimum of 16 credits from the following: SC/CHEM 3010 4.0, SC/CHEM 3011 4.0, SC/CHEM 3020 4.0, SC/CHEM 3021 4.0, SC/CHEM 3030 4.0, SC/CHEM 3031 4.0, SC/CHEM 3080 4.0;
- a minimum of 9 additional credits from Chemistry courses at the 4000 level, for an overall total of at least 56 credits from Chemistry courses.

Note: The following courses are required as prerequisites or corequisites for the Chemistry courses above: SC/MATH 1013 3.0; SC/MATH 1014 3.0; SC/PHYS 1410 6.0 or SC/PHYS 1010 6.0.

Honours Minor

- SC/CHEM 1000 6.0;
- at least 24 additional credits from Chemistry courses at the 2000 or higher level, for an overall total of at least 30 credits from Chemistry courses.

Note: Some 2000-level Chemistry courses require mathematics and physics courses as prerequisites or corequisites. Careful planning is required to ensure that prerequisites for the 2000- and higher-level Chemistry courses in which the student is interested are completed.

Computer Science

Note: The following degree requirements do not apply to students in the Space and Communication Sciences Stream of Specialized Honours Computer Science; for requirements of that stream, see "Space and Communication Sciences" in Science section V.

i) With the exception noted above, all BSc degree candidates must complete the programme core: SC/COSC 1020 3.0; SC/COSC 1030 3.0; SC/COSC 2001 3.0; SC/COSC 2011 3.0; SC/COSC 2021 3.0.

ii) All BSc degree candidates must comply with general regulation 4 (Science section IV) by completing the following (in addition to SC/COSC 1020 3.0 and SC/COSC 1030 3.0 from the programme core):

- SC/MATH 1090 3.0; SC/MATH 1300 3.0; SC/MATH 1310 3.0;
- 6 credits from SC/BIOL 1010 6.0, SC/BIOL 1410 6.0, SC/CHEM 1000 6.0, SC/EATS 1010 6.0, SC/PHYS 1410 6.0 or SC/PHYS 1010

6.0; (Note: In this context, SC/COSC 1020 3.0 and SC/COSC 1030 3.0 satisfy the other half of the 1000-level Science requirement for courses with laboratories.)

- at least 3 additional credits from SC/BIOL 1010 6.0, SC/BIOL 1410 6.0, SC/CHEM 1000 6.0, SC/EATS 1010 6.0, SC/EATS 1010 3.0, SC/EATS 1011 3.0, SC/MATH 1025 3.0, SC/PHYS 1070 3.0, SC/PHYS 1410 6.0 or SC/PHYS 1010 6.0;
- 12 general education credits (see "General Education Requirements" in Science section IV).

iii) All BSc degree candidates, in accordance with their declared programmes, must comply with general regulation 5 or 6 (Science section IV) and, in so doing, must also satisfy the course, credit and standing requirements specified below.

iv) All BSc degree candidates must satisfy a breadth requirement in Computer Science by completing 3 credits at the 3000 level from Group A courses in each of four areas: theory (second digit of course number is 1), hardware (second digit is 2), software (second digit is 3) and knowledge based (second digit is 4). Group A courses have odd course numbers; Group B courses have even course numbers.

v) All Honours BSc degree candidates must complete at least 30 credits which are neither computer science nor mathematics.

Note: See the general prerequisites for 2000-, 3000- and 4000-level Computer Science courses (under "Courses of Instruction") for information about cumulative grade-point average requirements in completed Computer Science courses.

Ordinary BSc Programme

To graduate in Ordinary. For students admitted to York University for 1999/2000 and subsequent years, the Senate of York University will require a minimum overall grade-point average of 4.0 in order to be eligible to graduate in an undergraduate Ordinary degree programme.

- the programme core, as specified in i) above;
- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above;
- SC/MATH 2320 3.0;
- at least 18 credits from Computer Science courses at the 3000 level satisfying the departmental breadth requirement [see iv) above], for an overall total of at least 33 credits from Computer Science courses;
- additional elective credits as required for an overall total of at least 90 credits, including at least 66 credits from Science courses.

Honours BSc Programmes

To declare Honours requires successful completion of at least 24 credits and a minimum cumulative credit-weighted grade-point average of 5.0* over all Science (SC) courses completed.

To proceed in each year of an Honours BSc programme requires a minimum cumulative credit-weighted grade-point average of 5.0* over all Science (SC) courses completed.

To graduate in an Honours BSc programme requires successful completion of all Faculty requirements and departmental required courses and a minimum cumulative credit-weighted grade-point average of 5.0* over all Science (SC) courses completed. For students admitted to York University for 1999/2000 and subsequent years, the Senate of York University will require a minimum overall grade-point average of 5.0 in order to be eligible to graduate in an undergraduate Honours degree programme.

* 6.0 for the Space and Communication Sciences Stream of Specialized Honours and for Honours Double Major with Biology.

Specialized Honours BSc Programme

- the programme core, as specified in i) above;
- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above;
- SC/MATH 2090 3.0; SC/MATH 2221 3.0; SC/MATH 2320 3.0;
- SC/COSC 3101 3.0; SC/COSC 4101 3.0 or SC/COSC 4111 3.0;
- at least 18 additional credits from Computer Science courses at the 3000 level satisfying the departmental breadth requirement [see iv) above];
- at least 9 additional credits from Computer Science courses at the 4000 level;

- at least 6 additional credits from Computer Science courses at the 3000 or 4000 level, for an overall total of at least 54 credits from Computer Science courses;
- additional elective credits as required from an overall total of at least 120 credits, including at least 90 credits from Science courses, at least 42 credits at the 3000 or higher level, and at least 30 credits which are neither computer science nor mathematics.

The Department of Computer Science also offers a Specialized Honours degree stream in **Space and Communication Sciences** whose degree requirements are specified in a separate entry in Science section V.

Honours Double Major and Honours Major/Minor BSc Programmes

An Honours Major in Computer Science may be combined with an Honours Major in another subject area in an Honours Double Major BSc degree programme (formerly Combined Honours - before 1999/2000), or with an Honours Minor in another subject area in an Honours Major/Minor BSc degree programme. Possible subject combinations for BSc degrees are listed under "Undergraduate Degree Programmes" in Science section I.

- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above and including choices appropriate for the second major or the minor;
- the Computer Science Honours Major requirements below;
- the course requirements for the second major or the minor;
- additional elective credits as required for an overall total of at least 120 credits, including at least 90 credits from Science courses, at least 42 credits at the 3000 or higher level, and at least 30 credits which are neither computer science nor mathematics.

Honours Major

- the programme core, as specified in i) above;
- at least 15 credits from Computer Science courses at the 3000 level satisfying the departmental breadth requirement [see iv) above];
- at least 12 credits from Computer Science courses at the 4000 level, for an overall total of at least 42 credits from Computer Science courses.

Note: The following courses are required as prerequisites or corequisites for the Computer Science courses above: SC/MATH 1090 3.0; SC/MATH 1300 3.0; SC/MATH 1310 3.0; SC/MATH 2090 3.0; SC/MATH 1025 3.0 or SC/MATH 2221 3.0 or SC/MATH 2320 3.0.

Honours Minor

- the programme core, as specified in i) above;
- 15 credits from Computer Science courses at the 3000 level, satisfying the departmental breadth requirement [see iv) above];
- 6 credits from Computer Science courses at the 4000 level, for an overall total of at least 36 credits from Computer Science courses.

Note: The following courses are required as prerequisites or corequisites for the Computer Science courses above: SC/MATH 1090 3.0; SC/MATH 1300 3.0; SC/MATH 1310 3.0; SC/MATH 2090 3.0; SC/MATH 1025 3.0 or SC/MATH 2221 3.0 or SC/MATH 2320 3.0.

Earth and Atmospheric Science

Note: The following BSc degree requirements do not apply to students in the Space and Communication Sciences Stream of Specialized Honours Earth and Atmospheric Science (see "Space and Communication Sciences" in Science section V) or the Atmospheric Chemistry Stream of Honours Double Major Earth and Atmospheric Science and Chemistry (see "Atmospheric Chemistry" in Science section V).

i) With the exceptions noted above, all BSc degree candidates must complete the EATS programme core: SC/CHEM 1000 6.0 or SC/EATS 1010 6.0; SC/COSC 1540 3.0; SC/EATS 2030 3.0; SC/EATS 2470 4.0; SC/MATH 1013 3.0; SC/MATH 1014 3.0; SC/MATH 1025 3.0; SC/MATH 2015 3.0; SC/MATH 2270 3.0; SC/PHYS 1010 6.0; SC/PHYS 2020 3.0; SC/PHYS 2211 1.0; SC/PHYS 2212 1.0. (Note: SC/PHYS 1410 6.0 with a minimum grade of C may replace SC/PHYS 1010 6.0.)

ii) All BSc degree candidates must comply with general regulation 4 (Science section IV) by completing the following (in addition to the EATS programme core):

- 12 general education credits (see "General Education Requirements" in Science section IV).

iii) All BSc degree candidates, in accordance with their declared programmes, must comply with general regulation 5 or 6 (Science section IV) and, in so doing, must also satisfy the course, credit and standing requirements specified below.

Ordinary BSc Programme

To graduate in Ordinary. For students admitted to York University for 1999/2000 and subsequent years, the Senate of York University will require a minimum overall grade-point average of 4.0 in order to be eligible to graduate in an undergraduate Ordinary degree programme.

- the EATS programme core, as specified in i) above;
- the Faculty of Pure and Applied Science general education requirements, as specified in ii) above;
- SC/EATS 2010 3.0 (for those wishing to emphasize Atmospheric Science) or SC/EATS 2050 4.0 (for those wishing to emphasize Earth Science);
- 9 credits from SC/EATS 3010 2.0 and SC/EATS 3011 1.0, SC/EATS 3020 3.0, SC/EATS 3030 3.0, SC/EATS 3040 3.0, SC/EATS 3180 3.0, SC/MATH 3241 3.0;
- 9 additional credits from Earth and Atmospheric Science courses at the 3000 or higher level;
- additional credits from Earth and Atmospheric Science courses as required for an overall total of at least 28 credits from Earth and Atmospheric Science courses;
- additional elective credits, approved by the Department of Earth and Atmospheric Science, as required for an overall total of at least 90 credits, including at least 66 credits from Science courses.

Honours BSc Programmes

To declare Honours requires successful completion of at least 24 credits and a minimum cumulative credit-weighted grade-point average of 5.0* over all Science (SC) courses completed.

To proceed in each year of an Honours BSc programme requires a minimum cumulative credit-weighted grade-point average of 5.0* over all Science (SC) courses completed.

To graduate in an Honours BSc programme requires successful completion of all Faculty requirements and departmental required courses and a minimum cumulative credit-weighted grade-point average of 5.0* over all Science (SC) courses completed. For students admitted to York University for 1999/2000 and subsequent years, the Senate of York University will require a minimum overall grade-point average of 5.0 in order to be eligible to graduate in an undergraduate Honours degree programme.

* 6.0 for the Space and Communication Sciences Stream of Specialized Honours and for Honours Double Major with Biology.

Honours Cores

The **Atmospheric Science Honours Core** requires the following in addition to the EATS programme core: SC/EATS 2010 3.0; SC/EATS 3030 3.0; SC/EATS 3040 3.0; SC/EATS 4050 6.0; SC/EATS 4120 3.0; SC/EATS 4130 3.0; SC/EATS 4140 3.0; SC/EATS 4230 3.0; SC/MATH 3241 3.0.

The **Earth Science Honours Core** requires the following in addition to the EATS programme core: SC/EATS 2050 4.0; SC/EATS 3010 2.0; SC/EATS 3011 1.0; SC/EATS 3020 3.0; SC/EATS 3140 4.0; SC/EATS 3180 3.0; SC/EATS 4010 6.0; SC/EATS 4020 3.0; SC/EATS 4040 3.0; SC/EATS 4220 3.0.

Specialized Honours BSc Programme

- the EATS programme core, as specified in i) above;
- the Faculty of Pure and Applied Science general education requirements, as specified in ii) above;
- all obligatory courses in one of the following streams:

Atmospheric Science Stream

- the Atmospheric Science Honours Core;
- at least 3 Science credits chosen from SC/CHEM 2011 3.0, SC/CHEM 2030 4.0, SC/GEOG 1400 6.0, SC/GEOG 2400 6.0, SC/MATH 2222 3.0, SC/MATH 2560 3.0 or SC/MATH 1131 3.0, SC/PHYS 2060 3.0, other Science courses authorized by the Department of Earth and Atmospheric Science;
- 12 credits (to include at least 6 credits from Earth and Atmospheric Science courses), chosen from the following: SC/EATS 3130 3.0, SC/EATS 4020 3.0, SC/EATS 4150 3.0, SC/EATS 4160 3.0, SC/EATS 4170 4.0, SC/EATS 4220 3.0, SC/EATS 4240 3.0, SC/GEOG 3700 3.0, SC/GEOG 4205 3.0, SC/GEOG 4210 3.0, SC/GEOG 4310 3.0, 3000- or 4000-level Special Topics courses in Earth and Atmospheric Science or Geography selected annually by the Earth and Atmospheric Science Department, for an overall total of at least 40 credits from Earth and Atmospheric Science courses;
- 12 additional credits from the above list or from the following: SC/EATS 1010 6.0, SC/EATS 3020 3.0, SC/GEOG 1400 6.0, SC/GEOG 2400 6.0, SC/MATH 3242 3.0, SC/MATH 3271 3.0, SC/MATH 3272 3.0, SC/MATH 3410 3.0, SC/MATH 4141 3.0, SC/MATH 4142 3.0, SC/PHYS 3050 3.0, SC/PHYS 3150 3.0, SC/PHYS 4120 3.0;
- 9 additional Science credits, approved by the Department of Earth and Atmospheric Science, as required for an overall total of at least 42 credits at the 3000 or higher level.

Earth Science Stream

- the Earth Science Honours Core;
- SC/EATS 2010 3.0;
- SC/MATH 3241 3.0; SC/MATH 3242 3.0; SC/MATH 3271 3.0; SC/PHYS 3020 3.0; SC/PHYS 3050 3.0;
- 9 credits from SC/EATS 3280 3.0, SC/EATS 3300 3.0, SC/EATS 4250 3.0, SC/EATS 4400 3.0, SC/MATH 3410 3.0, SC/PHYS 3070 3.0, SC/PHYS 3150 3.0, for an overall total of at least 42 credits from Earth and Atmospheric Science courses;
- 6 additional Science credits approved by the Department of Earth and Atmospheric Science;
- additional elective credits, approved by the Department of Earth and Atmospheric Science, as required for an overall total of at least 120 credits.

The Department of Earth and Atmospheric Science also offers a Specialized Honours degree stream in **Space and Communication Sciences** whose degree requirements are specified in a separate entry in Science section V.

Honours Double Major and Honours Major/Minor BSc Programmes

An Honours Major in Earth and Atmospheric Science may be combined with an Honours Major in another subject area in an Honours Double Major BSc degree programme (formerly Combined Honours - before 1999/2000), or with an Honours Minor in another subject area in an Honours Major/Minor BSc degree programme. Possible subject combinations for BSc degrees are listed under "Undergraduate Degree Programmes" in Science section I. Further information on course selection for various Honours Double Major programmes is detailed in the Earth and Atmospheric Science departmental handbook.

All degree candidates should contact departmental advisors as early as possible regarding course requirements for particular Honours Double Major and Honours Major/Minor programmes. Early planning of courses is strongly advised so that the necessary prerequisites for courses in both departments are met.

- the Faculty of Pure and Applied Science general education requirement, as specified in ii) above;
- the Earth and Atmospheric Science Honours Major requirements below;
- the course requirements for the second major or the minor;
- additional elective credits, approved by the Department of Earth and Atmospheric Science, as required for an overall total of at least 120 credits, including at least 42 credits at the 3000 or higher level.

In cooperation with the Department of Chemistry, the department offers an Honours Double Major Programme stream in the applied science area of **Atmospheric Chemistry** - see separate entry in Science section V.

Honours Major

An Honours Major in Earth and Atmospheric Science may be taken in either the Atmospheric Science Stream or the Earth Science Stream.

Atmospheric Science Stream

- the Atmospheric Science Honours Core, including the EATS programme core, as specified above;

Earth Science Stream

- the Earth Science Honours Core, including the EATS programme core, as specified above.

Honours Minor

- SC/EATS 1010 6.0;
- SC/EATS 2010 3.0; SC/EATS 2030 3.0; SC/EATS 2050 4.0;
- at least 9 credits from the following courses: SC/EATS 3010 2.0; SC/EATS 3011 1.0; SC/EATS 3020 3.0; SC/EATS 3030 3.0; SC/EATS 3040 3.0; SC/EATS 3180 3.0; SC/MATH 3241 3.0.

Note: The following courses are required as prerequisites or corequisites for the courses listed above: SC/COSC 1540 3.0; SC/MATH 1013 3.0; SC/MATH 1014 3.0; SC/MATH 1025 3.0; SC/MATH 2015 3.0; SC/MATH 2270 3.0; SC/PHYS 1010 6.0; SC/PHYS 2010 3.0; SC/PHYS 2020 3.0.

Concurrent Certificate in Geographic Information Systems (GIS) and Remote Sensing

See "Certificate Programmes" in Science section I.

Concurrent Certificate in Meteorology

See "Certificate Programmes" in Science section I.

Environmental Science

Specialized Honours BSc Programme

i) All BSc degree candidates must complete the programme core: SC/GEOG 1400 6.0; SC/GEOG 2400 6.0; SC/GEOG 2500 3.0 or SC/GEOG 2700 3.0; 6 credits from SC/GEOG 3200 3.0, SC/GEOG 3500 3.0, SC/GEOG 4180 4.0, SC/GEOG 4200 3.0, SC/GEOG 4280 3.0; 6 credits from SC/GEOG 3400 3.0, SC/GEOG 3600 3.0, SC/GEOG 3700 3.0, SC/GEOG 4100 3.0, SC/GEOG 4205 3.0, SC/GEOG 4210 3.0, SC/GEOG 4310 3.0, SC/GEOG 4400 3.0, SC/GEOG 4600 3.0; 12 additional credits from Science Geography courses (including 3 credits in statistics for students in the Physical Sciences Stream).

ii) All BSc degree candidates must comply with general regulation 4 (Science section IV) by completing the following (in addition to SC/GEOG 1400 6.0 from the programme core):

- SC/COSC 1540 3.0 (Physical Sciences Stream), or either SC/COSC 1520 3.0 or SC/COSC 1540 3.0 (Life Sciences Stream);
- SC/MATH 1505 6.0, or both SC/MATH 1013 3.0 and SC/MATH 1014 3.0 (for the Life Sciences Stream); or SC/MATH 1013 3.0, SC/MATH 1014 3.0 and SC/MATH 1025 3.0 (for the Physical Sciences Stream);
- SC/BIOL 1010 6.0 and one of SC/CHEM 1000 6.0 or SC/EATS 1010 6.0 (for the Life Sciences Stream); or SC/CHEM 1000 6.0 and one of SC/PHYS 1010 6.0 or SC/PHYS 1410 6.0 (for the Physical Sciences Stream);
- 12 general education credits (see "General Education Requirements" in Science section IV).

iii) All BSc degree candidates, in accordance with their declared programme, must comply with general regulation 6 (Science section IV) and, in so doing, must satisfy the course, credit and standing requirements specified below.

To declare Honours requires successful completion of at least 24 credits and a minimum cumulative credit-weighted grade-point average of 5.0 over all Science (SC) courses completed.

To proceed in each year of an Honours BSc programme requires a minimum cumulative credit-weighted grade-point average of 5.0 over all Science (SC) courses completed.

To graduate in an Honours BSc programme requires successful completion of all Faculty requirements and programme required courses and a minimum cumulative credit-weighted grade-point average of 5.0 over all Science (SC) courses completed. For students admitted to York University for 1999/2000 and subsequent years, the Senate of York University will require a minimum overall grade-point average of 5.0 in order to be eligible to graduate in an undergraduate Honours degree programme.

Additional Course Requirements

- 9 credits at the 2000 level or higher in the social, economic, political and policy aspects of environmental issues, chosen from courses listed in the Environmental Science supplemental calendar; (Students who wish to select a course not listed must consult with the Environmental Science coordinator.)
- all obligatory courses in one of the following streams:

Life Sciences Stream

- SC/BIOL 2010 4.0; SC/BIOL 2030 5.0 or SC/BIOL 2031 4.0; SC/BIOL 2050 3.0;
- one ecology field course (SC/BIOL 3001 3.0 or SC/BIOL 3001 2.0);
- SC/BIOL 3090 3.0 (or SC/MATH 1131 3.0 or SC/MATH 2560 3.0);
- 15 additional credits chosen from the following: a second ecology field course (SC/BIOL 3002 3.0 or SC/BIOL 3002 2.0), SC/BIOL 3170 3.0, SC/BIOL 4000 8.0, SC/BIOL 4020 3.0, SC/BIOL 4070 3.0, SC/BIOL 4080 3.0, SC/BIOL 4090 4.0, SC/BIOL 4095 3.0, SC/BIOL 4100 3.0, SC/BIOL 4120 3.0, SC/BIOL 4130 3.0, SC/BIOL 4170 4.0 (4170 3.0) (4170 2.0) (topics in ecology), SC/BIOL 4230 4.0, SC/BIOL 4240 4.0, SC/BIOL 4245 3.0, SC/BIOL 4250 3.0, SC/BIOL 4255 3.0, SC/BIOL 4340 3.0, SC/BIOL 4400 3.0, SC/BIOL 4420 3.0;
- additional elective credits, as required for an overall total of at least 120 credits, including at least 42 credits at the 3000 or higher level;

Physical Sciences Stream

- SC/EATS 2010 3.0; SC/EATS 2470 4.0;
- SC/CHEM 2030 4.0; SC/PHYS 2020 3.0;
- SC/MATH 2015 3.0; SC/MATH 2270 3.0;
- SC/EATS 3030 3.0; SC/EATS 3130 3.0; SC/EATS 4220 3.0;
- 6 additional credits chosen from SC/EATS 3040 3.0, SC/EATS 4050 6.0 (4050 3.0), SC/EATS 4120 3.0, SC/EATS 4130 3.0, SC/EATS 4140 3.0, SC/EATS 4150 3.0, SC/EATS 4160 3.0, SC/EATS 4170 4.0, SC/EATS 4230 3.0, SC/EATS 4240 3.0, SC/EATS 4300 3.0 (atmospheric science topics), SC/MATH 3241 3.0;
- additional elective credits, as required for an overall total of at least 120 credits, including at least 42 credits at the 3000 or higher level.

General Science

Ordinary BSc Programme

Open only to Science students co-registered in the Faculty of Education Junior-Intermediate Programme who are declaring Science as their teaching subject.

To graduate in Ordinary. For students admitted to York University for 1999/2000 and subsequent years, the Senate of York University will require a minimum overall grade-point average of 4.0 in order to be eligible to graduate in an undergraduate Ordinary degree programme.

i) All BSc degree candidates must complete the programme core: both SC/CHEM 2010 3.0 and SC/CHEM 2030 4.0, or both SC/CHEM 2011 3.0 and SC/CHEM 2020 5.0; SC/MATH 2015 3.0; SC/MATH 2270 3.0; either SC/BIOL 2010 4.0 or SC/BIOL 2030 5.0, and SC/BIOL 2050 3.0, or SC/PHYS 2010 3.0, SC/PHYS 2040 3.0, SC/PHYS 2211 1.0, and SC/PHYS 2212 1.0.

ii) All BSc degree candidates must comply with general regulation 4 (Science section IV) by completing the following courses:

- SC/COSC 1520 3.0 or SC/COSC 1540 3.0;
- SC/CHEM 1000 6.0; SC/BIOL 1010 6.0 or SC/PHYS 1010 6.0;
- SC/MATH 1013 3.0; SC/MATH 1014 3.0; SC/MATH 1025 3.0;
- 12 general education credits (see "General Education Requirements" in Science section IV).

iii) All BSc degree candidates, in accordance with their declared programme, must comply with general regulation 5 (Science section IV) except for the requirement that at least 24 credits be taken in one major subject area. To do this, candidates must complete additional elective credits as required for an overall total of at least 90 credits, including at least 66 credits from Science courses and at least 18 credits at the 3000 or higher level.

Note: Students who choose the Biology courses under i) and ii) above must take one of SC/EATS 1010 6.0, SC/PHYS 1410 6.0 or SC/PHYS 1010 6.0 in order to satisfy Faculty of Education requirements in Science as their Intermediate teaching subject. Students who choose the Physics courses under i) and ii) above must take at least 6 credits from the following: SC/BIOL 1010 6.0, SC/BIOL 2010 4.0, SC/BIOL 2030 5.0, SC/BIOL 2050 3.0, SC/KINE 2031 3.0, SC/NATS 1620 6.0, SC/NATS 1640 6.0, in order to satisfy Faculty of Education requirements in Science as their Intermediate teaching subject.

Geography

i) All BSc degree candidates must complete the programme core: SC/GEOG 1400 6.0; AS/GEOG 1410 6.0; SC/GEOG 2400 6.0; SC/GEOG 2420 3.0; SC/GEOG 2500 3.0 or SC/GEOG 2700 3.0 or both SC/GEOG 4205 3.0 and SC/GEOG 4210 3.0 (*Note: SC/GEOG 2700 3.0 is required for Honours Double Major in Geography and Earth Science; SC/GEOG 4205 3.0 and SC/GEOG 4210 3.0 are required for Honours Double Major in Geography and Atmospheric Science.*)

ii) All BSc degree candidates must comply with general regulation 4 (Science section IV) by completing the following (in addition to SC/GEOG 1400 6.0 from the programme core):

- SC/COSC 1520 3.0 or SC/COSC 1540 3.0;
- 6 credits from SC/MATH 1505 6.0, SC/MATH 1013 3.0, SC/MATH 1014 3.0, SC/MATH 1025 3.0;
- 12 credits from SC/BIOL 1010 6.0, SC/CHEM 1000 6.0, SC/EATS 1010 6.0, SC/PHYS 1410 6.0 or SC/PHYS 1010 6.0;
- 12 general education credits (see "General Education Requirements" in Science section IV).

iii) All BSc degree candidates, in accordance with their declared programmes, must comply with general regulation 5 or 6 (Science section IV) and, in so doing, must satisfy the course, credit and standing requirements specified below.

Ordinary BSc Programme

To graduate in Ordinary. For students admitted to York University for 1999/2000 and subsequent years, the Senate of York University will require a minimum overall grade-point average of 4.0 in order to be eligible to graduate in an undergraduate Ordinary degree programme.

- the programme core, as specified in i) above;
- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above;
- at least 6 credits from Science Geography courses at the 3000 or 4000 level, for an overall total of at least 30 credits from Geography courses;
- additional elective credits as required for an overall total of at least 90 credits, including at least 66 credits from Science courses and at least 18 credits at the 3000 or higher level.

Honours BSc Programmes

To declare Honours requires successful completion of at least 24 credits and a minimum cumulative credit-weighted grade-point average of 5.0 over all Science (SC) courses completed.

To proceed in each year of an Honours BSc programme requires a minimum cumulative credit-weighted grade-point average of 5.0 over all Science (SC) courses completed.

To graduate in an Honours BSc programme requires successful completion of all Faculty requirements and departmental required courses and a minimum cumulative credit-weighted grade-point average of 5.0 over all Science (SC) courses completed. For students admitted to York University for 1999/2000 and subsequent years, the Senate of York University will require a minimum overall grade-point average of 5.0 in

order to be eligible to graduate in an undergraduate Honours degree programme.

Specialized Honours BSc Programme

- the programme core, as specified in i) above;
- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above;
- SC/GEOG 3420 3.0;
- at least 33 additional credits from Science Geography courses at the 3000 or 4000 level, for an overall total of at least 54 credits from Science Geography courses (at least 60 from Geography courses);
- at least 6 credits from non-Geography Science courses at the 2000 or higher level;
- additional elective credits as required for an overall total of at least 120 credits, including at least 90 credits from Science courses and at least 42 credits at the 3000 or higher level.

Honours Double Major BSc Programmes (formerly Combined Honours - before 1999/2000)

Honours Double Major BSc programmes are offered in Geography and Earth and Atmospheric Science (in either the Atmospheric Science Stream or the Earth Science Stream).

- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above and including courses appropriate for the second major;
- for the **Geography and Atmospheric Science Stream**: at least 36 credits from Geography courses, including the programme core [see i) above], SC/GEOG 3420 3.0, and at least 3 credits from the following courses: SC/GEOG 3700 3.0, SC/GEOG 4000 6.0, SC/GEOG 4310 3.0, appropriate sections of SC/GEOG 3390 6.0 (3390 3.0) and SC/GEOG 4390 6.0 (4390 3.0) selected annually by the department; (*Note: If only 3 credits are chosen from the list above, 3 additional credits from Geography courses at the 3000- or 4000-level are required.*)

or

for the **Geography and Earth Science Stream**: at least 36 credits from Geography courses, including the programme core [see i) above], SC/GEOG 3420 3.0, and at least 9 credits selected from the following courses: SC/GEOG 2140 3.0, SC/GEOG 3400 3.0, SC/GEOG 3600 3.0, SC/GEOG 3700 3.0, SC/GEOG 4000 6.0, SC/GEOG 4100 3.0, SC/GEOG 4180 4.0, SC/GEOG 4200 3.0, SC/GEOG 4205 3.0, SC/GEOG 4210 3.0, SC/GEOG 4310 3.0, SC/GEOG 4400 3.0, SC/GEOG 4600 3.0, appropriate sections of SC/GEOG 3390 6.0 (3390 3.0) and SC/GEOG 4390 6.0 (4390 3.0) selected annually by the department;

- the course requirements for the second major;
- additional elective credits as required for an overall total of at least 120 credits, including at least 90 credits from Science courses and at least 42 credits at the 3000 or higher level.

Concurrent Certificate in Geographic Information Systems (GIS) and Remote Sensing

See "Certificate Programmes" in Science section I.

Honours Science

This Honours BSc programme has no declared major. It is appropriate for a student who wishes to enrol in a broader range of courses at the 3000 and 4000 levels than can normally be undertaken in Specialized Honours, Honours Double Major, or Honours Major/Minor programmes.

To declare "Honours Science" requires successful completion of at least 24 credits with a minimum cumulative credit-weighted grade-point average of 5.0 over all Science (SC) courses completed, and permission of the Faculty Honours Science advisor. The candidate is expected to provide a rationale for this choice of programme and a study plan.

To proceed in each year of the "Honours Science" Programme requires a minimum cumulative credit-weighted grade-point average of 5.0 over all Science (SC) courses completed and permission of the Faculty Honours Science advisor.

To graduate in the "Honours Science" Programme requires successful completion of the Faculty 1000-level requirements (see general regulation 4 in Science section IV) and the Faculty Honours requirements (see general regulation 6 in Science section IV) excluding the major requirement, and a minimum cumulative credit-weighted grade-point average of 5.0 over all Science (SC) courses completed. For students admitted to York University for 1999/2000 and subsequent years, the Senate of York University will require a minimum overall grade-point average of 5.0 in order to be eligible to graduate in an undergraduate Honours degree programme.

Kinesiology and Health Science

The School of Physical Education offers Honours BSc programmes in Kinesiology and Health Science. All BSc degree candidates must complete a specified core of academic and practicum courses, and, depending on individual interests, personal objectives and the stream selected, complement the designated requirements with optional courses from within and outside the School of Physical Education. The streams available for proceeding towards a Specialized Honours BSc are a) Health and Kinesiology, b) Applied Certificate and c) Discipline Specialization. The Health and Kinesiology Stream is particularly suited to students aspiring to careers related to teaching or recreation or for those desiring a generalized approach to Kinesiology and Health Science. The Applied Certificate Stream focuses on specific professionally related areas; a student in this stream graduates with a certificate as well as a BSc. The Discipline Specialization Stream concentrates studies in a particular academic area of Kinesiology and Health Science and is appropriate for those considering graduate studies and/or careers in research in exercise physiology or sport psychology. Kinesiology and Health Science may also be combined with the study of another Science major or a minor within the Faculty of Pure and Applied Science in an Honours Double Major or an Honours Major/Minor BSc programme.

On entering the university and selecting Kinesiology and Health Science as a major, first-year BSc students are automatically enrolled in the Health and Kinesiology Stream of Specialized Honours. Students who hope to proceed in an Honours Double Major or an Honours Major/Minor BSc programme select 1000-level science and mathematics options (within this stream) which are appropriate for the second major or the minor. After successful completion of 24 academic credits with a cumulative credit-weighted Science grade-point average of at least 5.0, students declare their choice of programme and stream. Entrance into the Applied Certificate or Discipline Specialization stream requires an application at this time - contact the School of Physical Education regarding application requirements and procedures.

Honours BSc Programmes

Note: Academic courses in Kinesiology and Health Science offered by the School of Physical Education have the prefix "KINE". Practicum courses have the prefix "PKIN".

i) All BSc degree candidates must complete the Kinesiology and Health Science core which includes an academic core: SC/KINE 1000 4.0; SC/KINE 1020 4.0; SC/KINE 2010 3.0; SC/KINE 2020 3.0; SC/KINE 2031 3.0; SC/KINE 2049 4.0; SC/KINE 2050 3.0; SC/KINE 3011 3.0; SC/KINE 3012 3.0; SC/KINE 3020 3.0 or SC/KINE 3090 3.0; SC/KINE 3030 3.0; SC/KINE 4010 3.0; SC/KINE 4020 3.0; and a practicum core: SC/PKIN 7500 2.0; and at least 2 credits in each of the following practicum areas: gymnastics/dance, aquatics, team sports, individual and dual sports, and track and field.

ii) All BSc degree candidates must comply with general regulation 4 (Science section IV) by completing the following (in addition to the Kinesiology and Health Science core):

- SC/COSC 1520 3.0;
- 6 credits from SC/MATH 1505 6.0, SC/MATH 1013 3.0 or SC/MATH 1300 3.0, SC/MATH 1014 3.0 or SC/MATH 1310 3.0, SC/MATH 1025 3.0;

- 6 credits from SC/BIOL 1010 6.0, SC/BIOL 1410 6.0, SC/CHEM 1000 6.0, SC/EATS 1010 6.0, SC/PHYS 1410 6.0 or SC/PHYS 1010 6.0; (*Note: Required Kinesiology and Health Science core courses satisfy the other half of the 1000-level Science requirement for courses with laboratories.*)
- SC/PSYC 1010 6.0;
- 12 general education credits (see "General Education Requirements" in Science section IV).

iii) All BSc degree candidates, in accordance with their declared Honours programme, must comply with general regulation 6 (Science section IV) and, in so doing, must also satisfy the course, credit and standing requirements specified below.

To declare Honours requires successful completion of at least 24 credits and a minimum cumulative credit-weighted grade-point average of 5.0* over all Science (SC) courses completed.

To proceed in each year of an Honours BSc programme requires a minimum cumulative credit-weighted grade-point average of 5.0* over all Science (SC) courses completed.

To graduate in an Honours BSc programme requires successful completion of all Faculty requirements and departmental required courses and a minimum cumulative credit-weighted grade-point average of 5.0* over all Science (SC) courses completed. For students admitted to York University for 1999/2000 and subsequent years, the Senate of York University will require a minimum overall grade-point average of 5.0 in order to be eligible to graduate in an undergraduate Honours degree programme.

* 6.0 for Honours Double Major with Biology.

Specialized Honours BSc Programme

Health and Kinesiology Stream

- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above;
- at least 54 academic credits from Kinesiology and Health Science courses, including the Kinesiology and Health Science academic core [see i) above] and at least 6 additional academic credits from Kinesiology and Health Science courses at the 4000 level;
- additional academic elective credits as required for an overall total of at least 120 credits, including at least 90 credits from Science courses and at least 42 credits at the 3000 or higher level;
- the practicum core [see i) above] and a minimum of 6 additional practicum credits, for an overall total of at least 18 practicum credits.

Students in the Health and Kinesiology Stream can use the available non-science elective credits in that stream to take courses towards a **Certificate in Sport Administration**. More than 120 credits may be required to complete both the certificate and the degree requirements. Consult the School of Physical Education for details.

Applied Certificate Stream

- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above;
- at least 66 academic credits from Kinesiology and Health Science courses, including the Kinesiology and Health Science academic core [see i) above] and all obligatory courses for one of the following certificates:

Certificate in Coaching: SC/KINE 2475 3.0; SC/KINE 3450 3.0 or AS/KINE 3580 3.0; SC/KINE 3570 3.0; SC/KINE 3610 3.0; SC/KINE 4550 6.0; SC/KINE 4600 3.0; SC/KINE 4610 3.0;

Certificate in Fitness Assessment and Exercise Counselling: AS/KINE 3240 3.0; SC/KINE 3400 3.0; SC/KINE 3450 3.0; SC/KINE 3640 3.0; SC/KINE 4400 6.0; AS/KINE 4430 3.0; SC/KINE 4460 3.0;

Certificate in Sport Therapy: SC/KINE 2490 3.0; SC/KINE 3450 3.0; SC/KINE 3585 3.0; SC/KINE 3600 3.0; SC/KINE 4570 3.0; SC/KINE 4580 3.0; SC/KINE 4590 6.0;

- additional academic elective credits as required for an overall total of at least 120 credits, including at least 90 credits from Science courses and at least 42 credits at the 3000 or higher level;

- the practicum core [see i) above] and a minimum of 4 additional practicum credits, for an overall total of at least 16 practicum credits. Specific practicum courses are required for each certificate (consult the Kinesiology and Health Science mini-calendar).

Discipline Specialization Stream

- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above;
- at least 54 academic credits from Kinesiology and Health Science courses, including the Kinesiology and Health Science academic core [see i) above] and at least 6 additional academic credits from Kinesiology and Health Science courses, at the 4000 level;
- additional academic elective credits as required for an overall total of at least 120 credits, including at least 90 credits from Science courses and at least 42 credits at the 3000 or higher level. *[Note: In this stream, 30 academic credits (including at least 12 credits in Kinesiology and Health Science courses) must be chosen for a specific discipline area (either exercise physiology or sport psychology). Consult the School of Physical Education for the courses required for each area.]*
- the practicum core [see i) above] and a minimum of 2 additional practicum credits, for an overall total of at least 14 practicum credits.

Honours Double Major and Honours Major/Minor BSc Programmes

An Honours Major in Kinesiology and Health Science may be combined with an Honours Major in another subject area in an Honours Double Major BSc degree programme (formerly Combined Honours - before 1999/2000), or with an Honours Minor in another subject area in an Honours Major/Minor BSc degree programme. Possible subject combinations are listed under "Undergraduate Degree Programmes" in Science section I.

- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above and including courses appropriate for the second major or the minor;
- the Kinesiology and Health Science Honours Major requirements below;
- the course requirements for the second major or the minor;
- additional academic elective credits as required for an overall total of at least 120 credits, including at least 90 credits from Science courses and at least 42 credits at the 3000 or higher level.

Honours Major

- the Kinesiology and Health Science core [see i) above], including the academic core and the practicum core;
- at least 6 additional academic credits from Kinesiology and Health Science courses at the 4000 level, for an overall total of at least 48 academic credits from Kinesiology and Health Science courses;
- at least 6 additional practicum (PKIN) credits, for an overall total of at least 18 practicum credits.

Note: SC/PSYC 1010 6.0 is required as a prerequisite for one 3000-level Kinesiology and Health Science core course.

Honours Minor

- the Kinesiology and Health Science core [see i) above], including the academic core and the practicum core, for a total of at least 42 academic credits from Kinesiology and Health Science courses;
- at least 6 additional practicum (PKIN) credits, for an overall total of at least 18 practicum credits.

Note: SC/PSYC 1010 6.0 is required as a prerequisite for one 3000-level Kinesiology and Health Science core course.

Mathematics and Statistics

The Department of Mathematics and Statistics offers BSc degree programmes in three subject/areas:

- I. Applied Mathematics
- II. Mathematics
- III. Statistics

The BSc degree programmes in each subject area are listed separately below. A student should choose one of these subject areas based on interest and employment goals, but it is possible to change subject areas provided the requirements of the desired subject area can be met.

- i) All BSc degree candidates must complete a programme core (see programme specifications below).
- ii) All BSc degree candidates must comply with general regulation 4 (Science section IV) by completing the following (in addition to the 1000-level COSC and MATH requirements specified for their programme):
 - 12 credits from SC/BIOL 1010 6.0 or SC/BIOL 1410 6.0, SC/CHEM 1000 6.0, SC/EATS 1010 6.0, SC/MATH 2041 3.0 and SC/MATH 2042 3.0, SC/PHYS 1410 6.0 or SC/PHYS 1010 6.0;
 - additional 1000-level Science credits (excluding SC/CHEM 1500 4.0, SC/CHEM 1520 4.0, SC/MATH 1500 3.0, SC/MATH 1510 6.0, SC/MATH 1515 3.0, SC/MATH 1525 3.0, SC/PHYS 1510 4.0, and all Natural Science courses) - as required for a total of at least 24 1000-level Science credits;
 - 12 general education credits (see "General Education Requirements" in Science section IV).
- iii) All BSc degree candidates, in accordance with their declared programmes, must comply with general regulation 5 or 6 (Science section IV) and, in so doing, must satisfy the course, credit and standing requirements specified below.

Ordinary BSc Programmes

To graduate in Ordinary. For students admitted to York University for 1999/2000 and subsequent years, the Senate of York University will require a minimum overall grade-point average of 4.0 in order to be eligible to graduate in an undergraduate Ordinary degree programme.

Honours BSc Programmes

To declare Honours requires successful completion of at least 24 credits and a minimum cumulative credit-weighted grade-point average of 5.0* over all Science (SC) courses completed.

To proceed in each year of an Honours BSc programme requires a minimum cumulative credit-weighted grade-point average of 5.0* over all Science (SC) courses completed.

To graduate in an Honours BSc programme requires successful completion of all Faculty requirements and departmental required courses and a minimum cumulative credit-weighted grade-point average of 5.0* over all Science (SC) courses completed. For students admitted to York University for 1999/2000 and subsequent years, the Senate of York University will require a minimum overall grade-point average of 5.0 in order to be eligible to graduate in an undergraduate Honours degree programme.

* 6.0 for Honours Double Major with Biology.

Notes:

1. For the purpose of satisfying departmental degree requirements, the following minimum numbers of credits must be completed within the Department of Mathematics and Statistics: 18 for the Ordinary Programme, 21 for the Honours Double Major Programme, 30 for the Specialized Honours Programme.

2. For BA degree programmes in Mathematics and Statistics, see "Programmes of Study" in the Faculty of Arts section in this Calendar.

I. Applied Mathematics BSc Programmes

All BSc degree candidates must complete the programme core: SC/COSC 1540 3.0 or SC/COSC 2031 3.0; SC/MATH 1013 3.0; SC/MATH 1014 3.0; SC/MATH 1016 1.0; SC/MATH 1017 1.0; SC/MATH 1025 3.0; SC/MATH 2015 3.0; SC/MATH 2018 1.0; SC/MATH 2041 3.0; SC/MATH 2270 3.0; SC/MATH 3241 3.0.

In addition, all degree candidates must select a number of credits (depending on their programme) from the following list.

List 1: SC/MATH 3110 3.0, SC/MATH 3131 3.0, SC/MATH 3170 6.0, SC/MATH 3241 3.0, SC/MATH 3242 3.0, SC/MATH 3260 3.0, SC/MATH 3271 3.0, SC/MATH 3410 3.0, SC/MATH 4000 6.0 (4000 3.0) (projects in Applied Mathematics only), SC/MATH 4141 3.0, SC/MATH 4142 3.0, SC/MATH 4160 3.0, SC/MATH 4170 6.0, SC/MATH 4240 3.0, SC/MATH 4241

3.0, SC/MATH 4270 3.0, SC/MATH 4271 3.0, SC/MATH 4430 3.0, SC/MATH 4470 3.0

Ordinary BSc Programme

- the programme core;
- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above;
- SC/MATH 2030 3.0 or SC/MATH 2222 3.0 or SC/MATH 2320 3.0;
- at least 12 additional credits selected from List 1 courses, for an overall total of at least 39 credits from major SC/MATH courses;
- additional elective credits as required for an overall total of at least 90 credits, including at least 66 credits from Science courses and at least 18 credits at the 3000 or higher level.

Specialized Honours BSc Programme

- the programme core;
- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above;
- SC/MATH 2030 3.0; SC/MATH 2222 3.0;
- SC/MATH 3110 3.0; SC/MATH 3210 3.0; SC/MATH 3242 3.0; SC/MATH 3410 3.0;
- at least 21 additional credits selected from List 1 courses (including SC/MATH 3260 3.0 or SC/MATH 3170 6.0, and at least 12 credits at the 4000 level), for an overall total of at least 63 credits from major SC/MATH courses;
- additional elective credits as required for an overall total of at least 120 credits, including at least 90 credits from Science courses and at least 42 credits at the 3000 or higher level.

Honours Double Major and Honours Major/Minor BSc Programmes

An Honours Major in Applied Mathematics may be combined with an Honours Major in another subject area in an Honours Double Major degree programme (formerly Combined Honours - before 1999/2000), or with an Honours Minor in another subject area in an Honours Major/Minor BSc degree programme. Possible subject combinations for BSc degrees are listed under "Undergraduate Degree Programmes" in Science section I.

- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above and including courses appropriate for the second major or the minor;
- the Applied Mathematics Honours Major requirements below;
- the course requirements for the second major or the minor;
- additional elective credits as required for an overall total of at least 120 credits, including at least 90 credits from Science courses and at least 42 credits at the 3000 or higher level.

Honours Major

- the programme core;
- SC/MATH 3242 3.0 or SC/MATH 3170 6.0;
- 12 credits at the 4000 level, selected from List 1 courses, for an overall total of at least 39 credits from major SC/MATH courses.

Honours Minor

- SC/COSC 1540 3.0;
- SC/MATH 1013 3.0; SC/MATH 1014 3.0; SC/MATH 1025 3.0;
- SC/MATH 2015 3.0; two of SC/MATH 2041 3.0, SC/MATH 2222 3.0, SC/MATH 2270 3.0;
- at least 9 credits from List 1 courses, including SC/MATH 3170 6.0 or SC/MATH 3241 3.0 or SC/MATH 3260 3.0, for an overall total of at least 27 credits from major SC/MATH courses.

II. Mathematics BSc Programmes

Ordinary BSc Programme

- SC/COSC 1520 3.0; SC/COSC 1530 3.0 or SC/MATH 2041 3.0; or equivalents;
- SC/MATH 1300 3.0 and SC/MATH 1310 3.0, or equivalents;
- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above;

- SC/MATH 1090 3.0 or SC/MATH 1190 3.0 or SC/MATH 2090 3.0 or SC/MATH 2320 3.0;
- SC/MATH 2221 3.0; SC/MATH 2222 3.0; SC/MATH 2310 3.0;
- at least 12 credits from major (i.e., without second digit 5) SC/MATH courses, or approved or equivalent courses, at the 3000 level or higher, for a total of at least 30 credits from major SC/MATH courses;
- additional elective credits as required for an overall total of at least 90 credits, including at least 66 credits from Science courses and at least 18 credits at the 3000 or higher level.

Note: Mathematics Honours Core courses SC/MATH 1000 3.0, SC/MATH 1010 3.0, SC/MATH 2010 3.0, SC/MATH 2021 3.0, and SC/MATH 2022 3.0 may replace SC/MATH 1300 3.0, SC/MATH 1310 3.0, SC/MATH 2310 3.0, SC/MATH 2221 3.0, and SC/MATH 2222 3.0, respectively.

Honours BSc Programmes

Mathematics Honours Core

The core courses below are required in all Honours Mathematics programmes.

- SC/MATH 1000 3.0; SC/MATH 1010 3.0;
- SC/MATH 1090 3.0 or SC/MATH 1190 3.0 or SC/MATH 2090 3.0 or SC/MATH 2320 3.0;
- SC/MATH 2010 3.0; SC/MATH 3010 3.0;
- SC/MATH 2021 3.0; SC/MATH 2022 3.0;
- SC/MATH 3020 6.0, or both SC/MATH 3131 3.0 and SC/MATH 3132 3.0;
- SC/MATH 3210 3.0;
- 6 credits from SC/MATH 4000 6.0 (4000 3.0) (projects in pure mathematics), SC/MATH 4010 6.0, SC/MATH 4020 6.0, SC/MATH 4030 3.0, SC/MATH 4080 6.0, SC/MATH 4110 3.0, SC/MATH 4120 3.0, SC/MATH 4130 3.0, SC/MATH 4140 3.0, SC/MATH 4150 3.0, SC/MATH 4160 3.0, SC/MATH 4170 6.0, SC/MATH 4210 3.0, SC/MATH 4230 3.0, SC/MATH 4250 6.0, SC/MATH 4280 3.0, SC/MATH 4290 3.0, SC/MATH 4430 3.0, SC/MATH 4630 3.0, SC/MATH 4730 3.0.

Note: Students may substitute non-Honours versions of the sequence SC/MATH 1000/1010/2010, but any student who does not complete SC/MATH 1010 3.0 must take SC/MATH 3110 3.0 above and beyond the normal Honours requirements. If one or more of SC/MATH 2021 3.0 or SC/MATH 2022 3.0 is replaced by other linear algebra courses and if the grades obtained were less than A, then SC/MATH 2090 3.0 or SC/MATH 2320 3.0 must be taken above and beyond the normal Honours requirements.

Specialized Honours BSc Programme

- the Mathematics Honours Core;
- SC/COSC 1520 3.0; SC/COSC 1530 3.0 or SC/MATH 2041 3.0; or equivalents;
- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above;
- at least 6 additional credits from major SC/MATH courses at the 4000 level (these must include either SC/MATH 4010 6.0 or SC/MATH 4020 6.0 if neither was taken as part of the Mathematics Honours Core);
- at least 24 additional credits from major (i.e., without second digit 5) SC/MATH courses, or approved or equivalent courses, for a total of at least 66 credits from major SC/MATH courses;
- additional elective credits as required for an overall total of at least 120 credits, including at least 90 credits from Science courses and at least 42 credits at the 3000 or higher level.

Honours Double Major and Honours Major/Minor BSc Programmes

An Honours Major in Mathematics may be combined with an Honours Major in another subject area in an Honours Double Major BSc degree programme (formerly Combined Honours - before 1999/2000), or with an Honours Minor in another subject area in an Honours Major/Minor BSc degree programme. Possible subject combinations for BSc degrees are listed under "Undergraduate Degree Programmes" in Science section I.

- SC/COSC 1520 3.0; SC/COSC 1530 3.0 or SC/MATH 2041 3.0; or equivalents;

- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above and including courses appropriate for the second major or the minor;
- the Mathematics Honours Major requirements below;
- the course requirements for the second major or the minor;
- additional elective credits as required for an overall total of at least 120 credits, including at least 90 credits from Science courses and at least 42 credits at the 3000 or higher level.

Honours Major

- the Mathematics Honours Core;
- at least 6 additional major (i.e., without second digit 5) SC/MATH credits at the 4000 level, for a total of at least 42 credits from major SC/MATH courses.

Honours Minor

- SC/MATH 1300 3.0; SC/MATH 1310 3.0;
- SC/MATH 1090 3.0 or SC/MATH 1190 3.0 or SC/MATH 2090 3.0 or SC/MATH 2320 3.0;
- SC/MATH 2221 3.0; SC/MATH 2222 3.0;
- SC/MATH 2310 3.0;
- at least 12 credits from major (i.e., without second digit 5) SC/MATH courses, or approved or equivalent courses, at the 3000 or higher level, for an overall total of at least 30 SC/MATH credits.

Note: Mathematics Honours Core courses SC/MATH 1000 3.0, SC/MATH 1010 3.0, SC/MATH 2010 3.0, SC/MATH 2021 3.0, and SC/MATH 2022 3.0 may replace SC/MATH 1300 3.0, SC/MATH 1310 3.0, SC/MATH 2310 3.0, SC/MATH 2221 3.0, and SC/MATH 2222 3.0, respectively.

III. Statistics BSc Programmes

Ordinary BSc Programme

- SC/COSC 1520 3.0 and SC/COSC 1530 3.0, or SC/COSC 1540 3.0, or SC/COSC 1020 3.0 and SC/COSC 1030 3.0, or equivalents;
- 6 credits from 1000-level major (i.e., without second digit 5) SC/MATH courses in calculus;
- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above;
- SC/MATH 1131 3.0; SC/MATH 2030 3.0; SC/MATH 2131 3.0;
- SC/MATH 2221 3.0 or SC/MATH 1025 3.0 or SC/MATH 2021 3.0; SC/MATH 2222 3.0 or SC/MATH 2022 3.0;
- SC/MATH 2310 3.0, or SC/MATH 2015 3.0, or SC/MATH 2010 3.0 and SC/MATH 3010 3.0;
- SC/MATH 3033 3.0; SC/MATH 3131 3.0;
- at least 3 additional credits from 3000- or 4000-level SC/MATH courses with third digit 3 (excluding SC/MATH 3230 3.0 and SC/MATH 3330 3.0), for a total of at least 33 credits from major SC/MATH courses;
- additional elective credits as required for an overall total of at least 90 credits, including at least 66 credits from Science courses and at least 18 credits at the 3000 or higher level.

Specialized Honours BSc Programme

- SC/COSC 1520 3.0 and SC/COSC 1530 3.0, or SC/COSC 1540 3.0, or SC/COSC 1020 3.0 and SC/COSC 1030 3.0, or equivalents;
- SC/MATH 1000 3.0; SC/MATH 1010 3.0; SC/MATH 1131 3.0;
- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above;
- SC/MATH 2010 3.0;
- SC/MATH 2021 3.0; SC/MATH 2022 3.0;
- SC/MATH 2030 3.0; SC/MATH 2131 3.0;
- SC/MATH 3010 3.0; SC/MATH 3210 3.0;
- SC/MATH 3033 3.0; SC/MATH 3034 3.0; SC/MATH 3131 3.0; SC/MATH 3132 3.0; SC/MATH 3430 3.0;
- 12 credits from 4000-level SC/MATH courses with third digit 3;
- 9 additional credits from major (second digit not 5) SC/MATH courses, for a total of at least 66 credits from major SC/MATH courses;
- additional elective credits as required for an overall total of at least 120 credits, including at least 90 credits from Science courses and at least 42 credits at the 3000 or higher level.

Honours Double Major BSc Programme

An Honours Major in Statistics may be combined with an Honours Major in another subject area in an Honours Double Major BSc degree programme (formerly Combined Honours - before 1999/2000). Possible subject combinations for BSc degrees are listed under "Undergraduate Degree Programmes" in Science section I.

- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above and including courses appropriate for the second major;
- the Statistics Honours Major requirements below;
- the course requirements for the second major;
- additional elective credits as required for an overall total of at least 120 credits, including at least 90 credits from Science courses and at least 42 credits at the 3000 or higher level.

Honours Major

- SC/COSC 1520 3.0 and SC/COSC 1530 3.0, or SC/COSC 1540 3.0, or SC/COSC 1020 3.0 and SC/COSC 1030 3.0, or equivalents;
- 6 credits from 1000-level major (i.e., without second digit 5) SC/MATH courses in calculus;
- SC/MATH 1131 3.0; SC/MATH 2030 3.0; SC/MATH 2131 3.0;
- SC/MATH 2010 3.0 and SC/MATH 3010 3.0, or SC/MATH 2015 3.0, or SC/MATH 2310 3.0;
- SC/MATH 2021 3.0 or SC/MATH 2221 3.0 or SC/MATH 1025 3.0; SC/MATH 2022 3.0 or SC/MATH 2222 3.0;
- SC/MATH 3033 3.0; SC/MATH 3131 3.0;
- 9 additional credits from 3000- or 4000-level SC/MATH courses with third digit 3 (excluding SC/MATH 3230 3.0 and SC/MATH 3330 3.0), for an overall total of at least 39 credits from major SC/MATH courses.

Physics and Astronomy

Note: The following BSc degree requirements do not apply to students in the Space and Communication Sciences Stream of Specialized Honours Physics and Astronomy - for requirements for that stream, see "Space and Communication Sciences" in Science section V.

- With the exception noted above, all BSc degree candidates must complete the programme core: SC/PHYS 1010 6.0; SC/PHYS 2010 3.0; SC/PHYS 2020 3.0; SC/PHYS 2040 3.0; SC/PHYS 2060 3.0; SC/PHYS 2211 1.0; SC/PHYS 3040 6.0. (*Note: All programme core courses require mathematics prerequisites or corequisites.*)
- All BSc degree candidates must comply with general regulation 4 (Science section IV) by completing the following (in addition to SC/PHYS 1010 6.0 from the programme core):
 - SC/COSC 1540 3.0 or SC/COSC 1020 3.0;
 - SC/MATH 1013 3.0; SC/MATH 1014 3.0; SC/MATH 1025 3.0;
 - SC/CHEM 1000 6.0 [or course(s) with laboratories required for the second major or the minor in Honours Double Major or Honours Major/Minor BSc programmes - see departmental mini-calendars or Faculty checklists];
 - 12 general education credits (see "General Education Requirements" in Science section IV).
- All BSc degree candidates, in accordance with their declared programmes, must comply with general regulation 5 or 6 (Science section IV) and, in so doing, must also satisfy the course, credit and standing requirements specified below.

Ordinary BSc Programme

To graduate in Ordinary. For students admitted to York University for 1999/2000 and subsequent years, the Senate of York University will require a minimum overall grade-point average of 4.0 in order to be eligible to graduate in an undergraduate Ordinary degree programme.

Students may follow a stream emphasizing Physics or Astronomy.

Students in both streams must take the following courses:

- the programme core, as specified in i) above;
- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above;

- SC/MATH 2015 3.0; SC/MATH 2270 3.0;
- 6 credits from SC/PHYS 3010 3.0, SC/PHYS 3020 3.0, SC/PHYS 3030 3.0; (*Note prerequisites and corequisite.*)

In addition, there are the following stream-dependent course requirements:

Physics Stream

- SC/PHYS 2212 1.0; SC/PHYS 3210 6.0;
- SC/CHEM 2011 3.0;
- at least 3 additional credits from 3000- or 4000-level Science courses;
- additional elective credits, chosen in consultation with the Department of Physics and Astronomy, as required for an overall total of at least 90 credits.

Astronomy Stream

- SC/PHYS 1070 3.0; SC/PHYS 2070 3.0; SC/PHYS 4270 4.0;
- at least 3 additional credits from 3000- or 4000-level Science courses;
- additional elective credits, chosen in consultation with the Department of Physics and Astronomy, as required for an overall total of at least 90 credits.

Honours BSc Programmes

To declare Honours requires successful completion of at least 24 credits and a minimum cumulative credit-weighted grade-point average of 5.0* over all Science (SC) courses completed.

To proceed in each year of an Honours BSc programme requires a minimum cumulative credit-weighted grade-point average of 5.0* over all Science (SC) courses completed.

To graduate in an Honours BSc programme requires successful completion of all Faculty requirements and departmental required courses and a minimum cumulative credit-weighted grade-point average of 5.0* over all Science (SC) courses completed. For students admitted to York University for 1999/2000 and subsequent years, the Senate of York University will require a minimum overall grade-point average of 5.0 in order to be eligible to graduate in an undergraduate Honours degree programme.

* 6.0 for the Space and Communication Sciences Stream of Specialized Honours and for Honours Double Major with Biology.

Specialized Honours BSc Programme

Students may follow a stream emphasizing either Physics, Applied Physics or Astronomy.

Students in all three streams must take the following courses:

- the programme core, as specified in i) above;
- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above;
- SC/CHEM 2011 3.0 (may be taken in Year 3); SC/MATH 2015 3.0; SC/MATH 2270 3.0; SC/PHYS 2212 1.0;
- SC/MATH 3271 3.0; SC/MATH 3410 3.0; SC/PHYS 3010 3.0; SC/PHYS 3020 3.0; SC/PHYS 3030 3.0; SC/PHYS 3210 6.0; SC/PHYS 4020 3.0.

In addition, there are the following stream-dependent course requirements:

Physics Stream

- SC/PHYS 4010 6.0; SC/PHYS 4040 3.0 or SC/PHYS 4050 3.0;
- either SC/PHYS 4210 3.0 and SC/PHYS 4211 3.0; or SC/MATH 3241 3.0, one of SC/MATH 3242 3.0 or SC/MATH 4270 3.0, and one of SC/PHYS 4210 3.0 or SC/PHYS 4211 3.0;
- 3 additional credits in PHYS courses at the 3000 level or higher;
- additional elective credits, chosen in consultation with the Department of Physics and Astronomy, as required for an overall total of at least 120 credits.

Applied Physics Stream

- SC/PHYS 3050 3.0; SC/PHYS 3150 3.0; SC/PHYS 4050 3.0; SC/PHYS 4210 3.0; SC/PHYS 4211 3.0; SC/PHYS 4310 3.0;

- 6 credits from SC/MATH 3241 3.0, SC/MATH 3242 3.0, SC/PHYS 3250 3.0, SC/PHYS 4120 3.0;
- additional credits from 3000- and 4000-level Science courses, chosen in consultation with the Department of Physics and Astronomy, as required for an overall total of at least 120 credits.

Astronomy Stream

- SC/PHYS 1070 3.0; SC/PHYS 2070 3.0; SC/PYS 3070 3.0; SC/PHYS 4070 3.0; SC/PHYS 4270 4.0;
- SC/MATH 3241 3.0; SC/MATH 3242 3.0 or SC/PHYS 4210 3.0; SC/PHYS 4010 6.0;
- 3 additional credits from PHYS courses at the 3000 level or higher;
- additional elective credits, chosen in consultation with the Department of Physics and Astronomy, as required for an overall total of at least 120 credits.

The Department of Physics and Astronomy also offers a Specialized Honours degree stream in **Space and Communication Sciences** whose degree requirements are specified in a separate entry in Science section V.

Honours Double Major and Honours Major/Minor BSc Programmes

An Honours Major in Physics and Astronomy may be combined with an Honours Major in another subject area in an Honours Double Major BSc degree programme (formerly Combined Honours - before 1999/2000), or with an Honours Minor in another subject area in an Honours Major/Minor BSc degree programme. Possible subject combinations for BSc degrees are listed under "Undergraduate Degree Programmes" in Science section I.

Early planning of courses in all combined programmes is strongly advised so that the necessary prerequisites for courses in both departments are met.

- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above and including courses appropriate for the second major or the minor;
- the Physics and Astronomy Honours Major requirements below;
- the course requirements for the second major or the minor;
- additional elective credits, chosen in consultation with the Department of Physics and Astronomy, as required for an overall total of at least 120 credits, and at least 42 credits at the 3000 or higher level.

Honours Major

Students may follow a stream emphasizing Physics or Astronomy.

Students in both streams must take the following courses:

- the programme core, as specified in i) above;
- 6 credits from SC/PHYS 3010 3.0, SC/PHYS 3020 3.0, SC/PHYS 3030 3.0.

Note: The following courses are required as prerequisites or corequisites for the courses above: SC/MATH 1013 3.0; SC/MATH 1014 3.0; SC/MATH 1025 3.0; SC/MATH 2015 3.0; SC/MATH 2270 3.0; SC/CHEM 2011 3.0 or SC/MATH 3271 3.0.

In addition, there are the following stream-dependent course requirements:

Physics Stream

- SC/PHYS 2212 1.0; SC/PHYS 3210 6.0;
- at least 6 credits from PHYS courses at the 4000 level, for an overall total of at least 44 credits from PHYS courses;

Astronomy Stream

- SC/PHYS 1070 3.0; SC/PHYS 2070 3.0; SC/PHYS 3220 3.0; SC/PHYS 4270 4.0; for an overall total of at least 44 credits from PHYS courses.

Honours Minor

Students may follow a stream in Physics or a stream in Astronomy in the minor subject area.

Students in both streams must take the following courses:

- the programme core, as specified in i) above;
- 3 credits from SC/PHYS 3010 3.0, SC/PHYS 3020 3.0, SC/PHYS 3030 3.0.

Note: The following courses are required as prerequisites or corequisites for the courses above: SC/MATH 1013 3.0; SC/MATH 1014 3.0; SC/MATH 1025 3.0; SC/MATH 2015 3.0; SC/CHEM 2011 3.0 or SC/MATH 2270 3.0. SC/MATH 3271 3.0 is a prerequisite for SC/PHYS 3020 3.0.

In addition, there are the following stream-dependent course requirements:

Physics Stream

- SC/PHYS 2212 1.0; SC/PHYS 3220 3.0; for an overall total of 32 credits from PHYS courses;

Astronomy Stream

- SC/PHYS 1070 3.0; SC/PHYS 2070 3.0; SC/PHYS 3070 3.0 or SC/PHYS 4270 4.0; for an overall total of at least 37 credits from PHYS courses.

Note: SC/PHYS 2270 3.0 is a prerequisite or corequisite for courses above.

Psychology

Substantive changes have been made to the requirements for BSc programmes in Psychology. The following requirements apply to all students admitted to York University for 1999/2000 and subsequent years. Although it is recommended that students who were admitted before 1999/2000 follow as many of the new requirements as possible, they may graduate according to the requirements of the year in which they were admitted.

i) All BSc degree candidates must complete SC/PSYC 1010 6.0. *[Note: Students must obtain a minimum grade of C (4.0) in SC/PSYC 1010 6.0 to be permitted to pursue a degree in Psychology as well as to take Psychology courses for which SC/PSYC 1010 6.0 is a prerequisite. Students who receive D or D+ in SC/PSYC 1010 6.0 have a single opportunity to take a requalifying examination on a specified date in the summer. A student must earn a grade of at least C on this examination to be permitted to proceed in Psychology courses. The examination result does not change the student's grade in SC/PSYC 1010 6.0. Students receiving E or F in SC/PSYC 1010 6.0 are not allowed to take the requalifying examination.]*

ii) All BSc degree candidates must comply with general regulation 4 (Science section IV) by completing the following (in addition to SC/PSYC 1010 6.0 from the programme core):

- SC/COSC 1520 3.0 or SC/COSC 1540 3.0;
- 6 credits from SC/MATH 1505 6.0, SC/MATH 1013 3.0, SC/MATH 1014 3.0, SC/MATH 1025 3.0;
- 12 credits from SC/BIOL 1010 6.0, SC/CHEM 1000 6.0, SC/EATS 1010 6.0, SC/PHYS 1410 6.0 or SC/PHYS 1010 6.0;
- 12 general education credits (see "General Education Requirements" in Science section IV).

iii) All BSc degree candidates, in accordance with their declared programmes, must comply with general regulation 5 or 6 (Science section IV) and, in so doing, must also satisfy the course, credit and standing requirements specified below.

Ordinary BSc Programme

To graduate in Ordinary. For students admitted to York University for 1999/2000 and subsequent years, the Senate of York University will require a minimum overall grade-point average of 4.0 in order to be eligible to graduate in an undergraduate Ordinary degree programme.

- SC/PSYC 1010 6.0 with a minimum grade of C;
- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above;
- SC/PSYC 2021 3.0 (or SC/PSYC 2020 6.0); SC/PSYC 2030 3.0;
- 3 credits from the following courses: SC/PSYC 2110 3.0, SC/PSYC 2120 3.0, SC/PSYC 2130 3.0, SC/PSYC 3140 3.0, SC/PSYC 3440 3.0;

- 3 credits from the following courses: SC/PSYC 2210 3.0, SC/PSYC 2220 3.0, SC/PSYC 2230 3.0, SC/PSYC 2240 3.0, SC/PSYC 3260 3.0, SC/PSYC 3270 3.0;
- at least 12 additional credits from Psychology courses (including at least 6 credits from Science Psychology courses), for an overall total of at least 30 credits from Psychology courses (including at least 12 credits at the 3000 level);
- additional elective credits as required for an overall total of at least 90 credits, including at least 66 credits from Science courses and at least 18 credits at the 3000 or higher level.

Note: At least half (50%) of the Psychology requirements above must be satisfied by Psychology courses offered by the Psychology departments at York (Arts, Atkinson, Glendon).

Honours BSc Programmes

To declare Honours requires successful completion of at least 24 credits and a minimum cumulative credit-weighted grade-point average of 5.0* over all Science (SC) courses completed.

To proceed in each year of an Honours BSc programme requires a minimum cumulative credit-weighted grade-point average of 5.0* over all Science (SC) courses completed.

To graduate in an Honours BSc programme requires successful completion of all Faculty requirements and departmental required courses and a minimum cumulative credit-weighted grade-point average of 5.0* over all Science (SC) courses completed. For students admitted to York University for 1999/2000 and subsequent years, the Senate of York University will require a minimum overall grade-point average of 5.0 in order to be eligible to graduate in an undergraduate Honours degree programme.

* 6.0 for Honours Double Major with Biology.

Specialized Honours BSc Programme

- SC/PSYC 1010 6.0 with a minimum grade of C;
- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above;
- SC/PSYC 2020 6.0, or SC/PSYC 2021 3.0 and SC/PSYC 2022 3.0, or SC/MATH 1131 3.0 and SC/MATH 2570 3.0, or SC/MATH 2560 3.0 and SC/MATH 2570 3.0;
- SC/PSYC 2030 3.0;
- one of SC/PSYC 3010 3.0, SC/PSYC 3030 6.0, SC/PSYC 3090 3.0, or alternate courses approved by the Department of Psychology;
- 6 credits from the following courses: SC/PSYC 2110 3.0, SC/PSYC 2120 3.0, SC/PSYC 2130 3.0, SC/PSYC 3140 3.0;
- 6 credits from the following courses: SC/PSYC 2210 3.0, SC/PSYC 2220 3.0, SC/PSYC 2230 3.0, SC/PSYC 2240 3.0, SC/PSYC 3250 3.0, SC/PSYC 3260 3.0, SC/PSYC 3270 3.0, SC/PSYC 3280 3.0, SC/PSYC 3290 3.0;
- SC/PSYC 4000 6.0 or SC/PSYC 4170 6.0; 6 additional credits from Psychology courses at the 4000 level;
- additional credits from Psychology courses, as required for an overall total of at least 54 credits from Psychology courses;
- additional elective credits as required for an overall total of at least 120 credits, including at least 90 credits from Science courses and at least 42 credits at the 3000 or higher level.

Notes:

1. *The statistics courses listed above as acceptable substitutes for SC/PSYC 2020 6.0 are counted as Psychology course credits.*

2. *At least half (50%) of the Psychology requirements above must be satisfied by Psychology courses offered by the Psychology departments at York (Arts, Atkinson, Glendon).*

Honours Double Major and Honours Major/Minor BSc Programmes

An Honours Major in Psychology may be combined with an Honours Major in another subject area in an Honours Double Major BSc degree programme, or with an Honours Minor in another subject area in an Honours Major/Minor BSc degree programme. Possible subject combinations for BSc degrees are listed under "Undergraduate Degree Programmes" in Science section I.

- the Faculty of Pure and Applied Science general education and 1000-level Science requirements, as specified in ii) above and including courses appropriate for the second major or the minor;
- the Psychology Honours Major requirements below;
- the course requirements for the second major or the minor;
- additional elective credits as required for an overall total of at least 120 credits, including at least 90 credits from Science courses and at least 42 credits at the 3000 or higher level.

Honours Major

- SC/PSYC 1010 6.0 with a minimum grade of C;
- SC/PSYC 2020 6.0, or SC/PSYC 2021 3.0 and SC/PSYC 2022 3.0, or SC/MATH 1131 3.0 and SC/MATH 2570 3.0, or SC/MATH 2560 3.0 and SC/MATH 2570 3.0;
- SC/PSYC 2030 3.0;
- 3 credits from the following courses: SC/PSYC 2110 3.0, SC/PSYC 2120 3.0, SC/PSYC 2130 3.0, SC/PSYC 3140 3.0, SC/PSYC 3440 3.0;
- 3 credits from the following courses: SC/PSYC 2210 3.0, SC/PSYC 2220 3.0, SC/PSYC 2230 3.0, SC/PSYC 2240 3.0, SC/PSYC 3260 3.0, SC/PSYC 3270 3.0;
- SC/PSYC 4000 6.0 or SC/PSYC 4170 6.0; 6 additional credits from Psychology courses at the 4000 level;
- at least 9 additional credits from Psychology courses, for an overall total of at least 42 credits from Psychology courses.

Notes:

- The statistics courses listed above as acceptable substitutes for SC/PSYC 2020 6.0 are counted as Psychology course credits.
- At least half (50%) of the Psychology requirements above must be satisfied by Psychology courses offered by the Psychology departments at York (Arts, Atkinson, Glendon).

Honours Minor

- SC/PSYC 1010 6.0 with a minimum grade of C;
- 6 credits from Psychology courses at the 4000 level;
- at least 18 additional credits from Psychology courses, for an overall total of at least 30 credits from Psychology courses.

Note: At least half (50%) of the Psychology requirements above must be satisfied by Psychology courses offered by the Psychology departments at York (Arts, Atkinson, Glendon).

Joint York/Seneca Certificate Programme in Rehabilitation Services

See "Certificate Programmes" in Science section I.

Space and Communication Sciences (Applied Science Streams)

Each of the departments of Computer Science, Earth and Atmospheric Science, and Physics and Astronomy offers a Specialized Honours degree stream in Space and Communication Sciences.

- All BSc degree candidates must complete the Space and Communication Sciences core: SC/COSC 1020 3.0; SC/COSC 1030 3.0; SC/MATH 1013 3.0; SC/MATH 1014 3.0; SC/MATH 1025 3.0; SC/MATH 1090 3.0; SC/PHYS 1010 6.0; SC/CHEM 1000 6.0 or SC/EATS 1010 6.0; SC/COSC 2011 3.0; SC/COSC 2021 3.0; SC/MATH 2015 3.0; SC/MATH 2090 3.0; SC/MATH 2270 3.0; SC/PHYS 2010 3.0 or SC/EATS 2470 4.0; SC/PHYS 2020 3.0; SC/PHYS 2040 3.0; SC/PHYS 2211 1.0; SC/COSC/EATS/PHYS 3001 1.0; SC/COSC 3121 3.0; SC/COSC 3211 3.0; SC/EATS/PHYS 3280 3.0; SC/PHYS 3050 3.0; SC/PHYS 3250 3.0; SC/COSC/EATS/PHYS 4001 6.0.
- All BSc degree candidates must comply with general regulation 4 (Science section IV) by completing the following (in addition to the 1000-level courses specified in the programme core):
 - 12 general education credits (see "General Education Requirements" in Science section IV).

iii) All BSc degree candidates, in accordance with their declared programme, must comply with general regulation 6 (Science section IV) and, in so doing, must also satisfy the course, credit and standing requirements specified below.

iv) All BSc degree candidates must complete a non-credit industrial internship (normally salaried) approved by the departmental Space and Communication Sciences coordinator. The minimum experience requirement is a four-month placement, normally after the third year of study, though terms of eight, twelve or sixteen months are preferred.

Honours BSc Programmes

To declare Honours requires successful completion of at least 24 credits and a minimum cumulative credit-weighted grade-point average of 6.0 over all Science (SC) courses completed.

To proceed in each year of an Honours BSc programme requires a minimum cumulative credit-weighted grade-point average of 6.0 over all Science (SC) courses completed.

To graduate in an Honours BSc programme requires successful completion of all Faculty requirements and departmental required courses and a minimum cumulative credit-weighted grade-point average of 6.0 over all Science (SC) courses completed. For students admitted to York University for 1999/2000 and subsequent years, the Senate of York University will require a minimum overall grade-point average of 5.0 in order to be eligible to graduate in an undergraduate Honours degree programme.

Specialized Honours in Computer Science

- the Space and Communication Sciences core;
- the Faculty of Pure and Applied Science general education requirements, as specified in ii) above;
- SC/COSC 2001 3.0;
- one of SC/CHEM 2011 3.0, SC/COSC 2031 3.0, SC/EATS 2010 3.0, SC/EATS 2030 3.0, SC/PHYS 1070 3.0, SC/PHYS 2060 3.0;
- SC/COSC 3321 3.0;
- one of SC/COSC 3311 3.0, SC/COSC 3331 3.0, SC/COSC 3401 3.0;
- one of the following: any 3000-level Computer Science course (without second digit 5) not already completed, SC/EATS 3020 3.0, SC/EATS 3030 3.0, SC/MATH 3271 3.0, SC/MATH 3410 3.0, SC/PHYS 3020 3.0, SC/PHYS 3070 3.0, SC/PHYS 3080 3.0, SC/PHYS 3150 3.0, SC/PHYS 4120 3.0, other courses approved by the Department of Computer Science;
- two of SC/COSC 4242 3.0, SC/COSC 4331 3.0, SC/COSC 4421 3.0, SC/COSC 4422 3.0;
- SC/COSC 4351 3.0 or SC/COSC 4352 3.0;
- one of SC/COSC 4301 3.0, SC/COSC 4302 3.0, SC/COSC 4321 3.0, SC/COSC 4341 3.0;
- two courses selected from the following: the 4000-level COSC courses listed above (not already taken), SC/EATS 4220 3.0, SC/EATS 4230 3.0, SC/EATS 4020 3.0 or SC/PHYS 4060 3.0, SC/PHYS 3070 3.0, SC/PHYS 4110 3.0, SC/PHYS 4270 3.0, SC/PHYS 4450 3.0; for an overall total of at least 46 credits in Computer Science.

Specialized Honours in Earth and Atmospheric Science

- the Space and Communication Sciences core, including SC/EATS 2470 4.0;
- the Faculty of Pure and Applied Science general education requirements, as specified in ii) above;
- SC/EATS 2010 3.0; SC/EATS 2030 3.0;
- SC/EATS 3020 3.0; SC/EATS 3030 3.0; SC/EATS 4220 3.0; SC/EATS 4230 3.0; SC/EATS 4250 3.0; SC/MATH 3271 3.0;
- at least 6 credits from courses approved by the Department of Earth and Atmospheric Science (see departmental handbook for list of approved courses), including at least 2 credits at the 3000 or 4000 level, for an overall total of at least 35 credits in Earth and Atmospheric Science.

Specialized Honours in Physics and Astronomy

- the Space and Communication Sciences core, including SC/PHYS 2010 3.0;
 - the Faculty of Pure and Applied Science general education requirements, as specified in ii) above;
 - two of SC/CHEM 2011 3.0, SC/COSC 2001 3.0, SC/EATS 2010 3.0, SC/EATS 2030 3.0, SC/PHYS 1070 3.0, SC/PHYS 2060 3.0, SC/PHYS 2070 3.0, SC/PHYS 3070 3.0;
 - SC/MATH 3271 3.0; SC/PHYS 3020 3.0; SC/PHYS 3040 6.0;
 - one of SC/COSC 3212 3.0, SC/COSC 3401 3.0, SC/EATS 3020 3.0, SC/MATH 3410 3.0, SC/PHYS 3010 3.0, SC/PHYS 3030 3.0, SC/PHYS 3070 3.0, SC/PHYS 3150 3.0, SC/PHYS 3220 3.0, SC/PHYS 4120 3.0, other courses approved by the Department of Physics and Astronomy;
 - SC/PHYS 4110 3.0; SC/PHYS 4250 3.0; SC/PHYS 4450 3.0;
 - one of SC/COSC 4421 3.0, SC/COSC 4422 3.0, SC/EATS 4220 3.0, SC/EATS 4230 3.0, SC/PHYS 3070 3.0, SC/PHYS 4020 3.0, SC/PHYS 4060 3.0, SC/PHYS 4270 3.0, SC/PHYS 4410 3.0, SC/PHYS 4550 3.0.
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Statistics

See Mathematics and Statistics.
