

Purpose

The mission of the Faculty of Natural and Applied Sciences is to produce godly Christians with expertise in the theoretical and applied sciences, an understanding of and appreciation for the relationship of scientific knowledge to authoritative biblical truth, as well as an awareness of the present and potential impact of science on society. Responsible scientific advancement requires men and women with sound ethical judgment in addition to scientific expertise. Natural sciences students at Trinity Western University will acquire the fundamental scientific, general, and biblical knowledge which equips them to make a positive scientific contribution in industry, research, teaching, or the health sciences.

Perspective

Natural Sciences students will be challenged to live a Christ-centred life while developing a high degree of competence in their specialty. Students learn to apply biblical understanding to scientific issues of today, developing their own answers to many of the ethical issues facing our highly technological society. Students may choose from programs and course work in Biology, Chemistry, Computing Science, Physical Geography, Geology, Mathematics (pure and applied), Nursing, and Physics, including well-supervised and up-to-date laboratory experience. The Natural Sciences faculty are capable and committed professors who teach their discipline with a deep love for Christ and an awareness of His claim on their lives. They keep abreast of new scientific thought and discovery, and as teachers, are expected to continuously advance in their field of expertise as well as in the application of scriptural truth to their own discipline. Natural Sciences students learn an appreciation for scriptural truth and its relevance to scientific issues of today. The Faculty emphasizes that knowledge of our created world is possible only because all things are held together through Christ.

Program

The Faculty offers a Bachelor of Science degree majoring in Biology, Chemistry, Computing Science, Mathematics, Applied Mathematics with Computing Science, or Nursing. An honours degree is available in Biology. Jointly with the Faculty of Humanities and Social Sciences, the Faculty offers a major in Environmental Studies. A major in General Science with a concentration in Chemistry, Computing Science, Biology, Mathematics, Applied Mathematics with Computing Science or Physics is also available. With the exception of Nursing and Environmental Studies, minors are offered in each discipline where a major or concentration is offered. In recent years the Faculty has expanded considerably, and graduates' successes have confirmed the academic strength of the program. Natural sciences students may also complete the requirements of many pre-professional programs such as medicine, dentistry, engineering, forestry, agriculture, and architecture. Emphases of the natural sciences program include:

Scientific Awareness: Scientific investigation demands well-sharpened analytical, mathematical, observational, and laboratory skills. Faculty members will help students develop an appreciation for the essentials of the scientific method and

a disciplined approach to scientific investigation. Students will be encouraged to approach science as a study of the intricate details of design and order inherent in creation and the resulting functional processes. The comprehensive nature of the program prepares students for entry into more advanced scientific studies at the graduate level.

The Scope and Limitations of Science: Careful attention is given to developing sound judgment as to the scope and limits of scientific enterprise. Senior students will be encouraged to expand their capacity to address the ethical issues inherent in scientific discovery.

Practical Application: Science teaches clear, logical thought and a rigorous, analytical approach to problems—valuable skills in any profession. Professors will urge students to apply basic scientific principles to daily life, enabling them to adapt effectively to an increasingly technological world.

An increasing number of field courses are being offered as part of the science programs, including marine biology courses in Hawaii and Salt Spring Island, British Columbia, and transcultural nursing experiences in a variety of Canadian and international areas.

Recommended Guidelines for First Year Courses

The Faculty of Natural and Applied Sciences believes that students taking courses in the Faculty should have as many choices for entry points into the program as is consistent with providing a quality university education. Students should take note of the following 100 level courses and their prerequisites to determine which course is appropriate for them.

Note: a. Almost all Chemistry, Physics, and Biology courses have required labs that must be signed up for at registration.

b. Some Chemistry and Physics courses have required tutorials that must be signed up for at registration.

c. Students sign up for Computing Science course labs after classes have started.

Biology:

First year Biology students with Grade 12 Biology should take BIOL 113 and 114 as well as CHEM 111 and 112 or CHEM 103, 112. BIOL 241 and 242 are available without prerequisite for non-Biology majors. Biology students who have Grade 12 Mathematics should take MATH 123. Biology students with a weaker background in mathematics should take precalculus MATH 100.

Chemistry:

To complete a Chemistry major or minor, the following courses are normally taken in first year: CHEM 111, 112; or CHEM 103, 104; or CHEM 103, 112; MATH 123, 124; PHYS 111, 112. Physics may be delayed to second year if desired. Students desiring a terminal general Chemistry course: CHEM 101. Science majors with Chemistry 11: CHEM 103, 104. CHEM 103–4 lectures per week. Science majors with Chemistry 12 or high standing

in Chemistry 11: CHEM 111, 112.

Note: Students with a B or better in CHEM 103 may take CHEM 112. Students with a B or better in CHEM 104 may take second year Chemistry courses.

Computing Science:

Students with no previous computing experience: CMPT 100 and applications modules as needed. Business students with a computing literacy course: CMPT 101 and applications modules as needed.

Science majors:

- with credit for a University Pascal course: CMPT 143 (second semester);
- with a B or better in Algebra 12 and Computing Science programming from high school: CMPT 141 (second semester);
- with some computing experience but little programming: CMPT 140 and 145

Note: CMPT 100 and 101 and applications modules cannot be counted as fulfilling any of the science requirements toward a major in science.

No computing course may be used to satisfy lab science requirements for any TWU program.

Mathematics:

All students without Mathematics 12 or with less than a B grade in Mathematics 12 needing calculus later: MATH 100.

Education majors: elementary level pre-service teachers only with weak mathematics background: MATH 190; secondary level or elementary level with a B or more in Mathematics 12: MATH 123.

Business majors (B.B.A. program) with at least a B in Mathematics 12 or MATH 100 or 101: MATH 120. Otherwise, take MATH 101; with a very good math background: MATH 123.

Science majors: MATH 123, 124

Note: No student may take both MATH 190 and 101. Also, MATH 120 and 123 cannot both be taken for credit.

Nursing:

Nursing courses at the 200 level and above are only open to those admitted as students to the Department of Nursing, or by permission of the Director of Nursing. First year Nursing courses may be taken by non-Nursing students, subject to class and laboratory availability. First priority is given to students admitted to the first year program in Nursing.

Physics:

Students wishing to complete a concentration or minor in Physics should take PHYS 111, 112; and MATH 123, 124.

Additional Information:

All students must register in the tutorials for CHEM 103, 104; CHEM 111, 112; and PHYS 111, 112.

Students who have not completed Grade 12 Physics but need PHYS 111, 112 will be allowed

entrance with the condition that attendance at the tutorial is compulsory.

Applied Mathematics with Computing Science

Department of Mathematical Sciences

Dr. John Byl, Chair

The Department of Mathematical Sciences offers a major in Computing Science, leading to a B.Sc. Degree, as well as a concentration and a minor.

This program offers a departmental major in Applied Mathematics which stresses applications to practical problems, making use of computers.

General Graduation Requirements

(See also Academic Information section, particularly for further details on core requirements.)

| | Sem. hrs. |
|--|------------|
| Mathematics and Computer Science (24 sem. hrs. must be 300 or 400 level) | 42 |
| ENGL 103, 104 | 6 |
| Fine Arts | 3 |
| History | 3 |
| Human Kinetics (incl. HKIN190) | 4 |
| IDIS 102 | 1 |
| CMPT 480 or MATH 480 | 3 |
| NATS 490 | 1 |
| Philosophy (PHIL 350 recommended) | 3 |
| PHYS 111, 112 | 6 |
| Religious Studies (incl. RELS 101, 102; Bible content; Christianity & Intercultural Studies) | 12 |
| Society and Culture | 3 |
| UNIV 101 | 1 |
| Electives | 34 |
| Total | 122 |

Specific Requirements

MATH 123, 124 Calculus I and II
 MATH 223 Calculus III
 MATH 250 Linear Algebra
 MATH 321 Differential Equations I
 MATH 330 Numerical Analysis I
 MATH 480 or CMPT 480 Ethical and Social Issues (CMPT 480 or MATH 480 fulfils NATS 487 requirement.)
 CMPT 141* Introduction to First Modular Language

*or CMPT 143 or 145

plus at least 3 sem. hrs. in a 200 level CMPT course, 3 sem. hrs. in a 300 or 400 level CMPT course, and 12 sem. hrs. Mathematics and/or Computing Science electives at a 300 or 400 level.

Students who do not have a strong background in computer programming must either take CMPT 140 or have the instructor's permission before enrolling in CMPT 141.

Note: MATH 100, 101, 102, 120, 150, and CMPT courses numbered below 130 do not count towards a Mathematics, Applied Mathematics with Computing Science, or Computing Science major, concentration, or minor.

Concentration in Applied Mathematics with Computing Science

Mathematics and Computing Science: 30 sem. hrs. including:
 MATH 123, 124
 Calculus I and II
 MATH 223
 Calculus III
 CMPT 141, 143, or 145
 Introduction to a First Modular Language
 CMPT 200 level for 3 sem. hrs.
 plus another 15 sem. hrs. of Mathematics and Computing Science courses, at least 6 of each (12 altogether) are at the 300 or 400 level.

Minor in Applied Mathematics with Computing Science

(see General Graduation Requirements section), the following specific requirements apply: 24 sem. hrs. including MATH 123, 124; and 9 sem. hrs. of Mathematics electives, of which 6 sem. hrs. are at a 300 or 400 level; CMPT 141 (or 143 or 145); 3 sem. hrs. of a 200 level Computing Science elective; and 3 sem. hrs. of a 300 or 400 level Computing Science elective.

Biology

*Department of Biology
 Dr. Richard J. L. Paulton, Chair*

The Department of Biology offers two programs in Biology: a B.Sc. Honours program and a B.Sc. Major. In addition, the Department shares in offering the Environmental Studies program, an interdisciplinary major involving the Natural Sciences and Social Sciences Faculties. The Department provides students with a thorough understanding of the role of biology in modern society. Students are prepared for careers in ecology and environmental science, biotechnology, and medical science. Courses of study fully meet the requirements for professional schools—medicine, dentistry, veterinary medicine, chiropractic, physiotherapy—as well as those for graduate school. The Department provides opportunities for further study in the spring and summer at the Au Sable Institute for Environmental Studies in Washington state, the Great Lakes area, Virginia, Africa, and India. The Biology Department offers co-op programs that provide work experience in applied biology. It encourages students to participate in faculty research programs in ecology, marine biology, biotechnology, and medical science.

Honours Program in Biology, B.Sc. (Honours) Degree

The Honours Degree in Biology provides students with sufficient latitude to design an in-depth program of study tailored to a specific emphasis in Biology. The Biology Department currently offers

four emphases in the Honours program: Cell and Developmental Biology, Biochemistry and Molecular Biology, Ecology, and General Biology.

General Graduation Requirements

(See also Academic Information section, particularly for further details on core requirements.)

| | Sem. hrs. |
|--|------------|
| Biology (36 sem. hrs. must be 300 or 400 level) | 54 |
| Chemistry (CHEM 111, 112; and 221, 222) | 12 |
| ENGL 103, 104 | 6 |
| Fine Arts | 3 |
| History | 3 |
| Human Kinetics (incl. HKIN 190) | 4 |
| IDIS 102 | 1 |
| MATH 123, 124 | 6 |
| NATS 487, 490 | 3 |
| Philosophy | 3 |
| PHYS 111, 112 | 6 |
| Religious Studies (incl. RELS 101, 102; Bible content; Christianity & Intercultural Studies) | 12 |
| Society and Culture | 3 |
| UNIV 101 | 1 |
| Electives | 17 |
| Total | 134 |

Requirements for the Honours Degree:

- 1) Admission into the Biology Honours program requires a cumulative GPA of 3.0 over the first two years of study, a GPA of 3.0 in Biology courses, and an overall GPA of 2.7 for graduation.
- 2) A total of 134 sem. hrs. must be completed.
- 3) A minimum of 54* sem. hrs. in Biology courses must be completed of which 36 sem. hrs. must be upper level (300 or higher). (*Except for Biochemistry and Molecular Biology emphasis.) See table.

Specific Requirements

The following Biology courses are required:

BIOL 113, 114 General Biology
 BIOL 223 Cell Biology
 BIOL 308, 345,

or 360 Zoology
 BIOL 312 or 314 Botany (or other Botany course)
 BIOL 333 or 334 Microbiology
 BIOL 371, 372 Genetics
 BIOL 381 Ecology
 BIOL 384, 386 Biochemistry
 BIOL 409, 410 Senior Thesis

Cell and Developmental Biology Emphasis

Students must take BIOL 336 and 15 additional sem. hrs. from the following:

BIOL 308 or 360 (Zoology—whichever course was not already taken as a Specific Requirement above)
 BIOL 312 or 314 (Botany— whichever course was not already taken as a Specific Requirement above)
 BIOL 315, 340, 343, 345, 346, 350
 BIOL 333 or 334 (Microbiology—whichever course was not already taken as a Specific Requirement above)
 BIOL 421, 422; 438, 450, 474

Biochemistry and Molecular Biology Emphasis

Students must take the following 12 sem. hrs. of Biology courses from: BIOL 333 or 334 (Microbiology—whichever course was not already taken as a Specific Requirement); BIOL 336; 421, 422; 438, 474. The following ancillary courses are also required: CHEM 230, 240; 321, 322; 355, 356.

Ecology Emphasis

Students must take 18 sem. hrs. from the following:
 BIOL 308 or 360 (Zoology— whichever course(s) was/were not already taken as a Specific Requirement)
 BIOL 312 or 314 (Botany— whichever course(s) was/were not already taken as a Specific Requirement)
 BIOL 316, 318, 364, 382, 391, 392, 482
 Recommended electives are CHEM 370; MATH 102, 310.

Additional electives are also available through Au Sable Institute.

General Biology Emphasis

18 sem. hrs. of 300 or 400 level Biology courses to be chosen in consultation with a Biology advisor from two of the following subdisciplines: Botany, Ecology, Genetic and Molecular Biology, Microbiology and Immunology, Physiology, or Zoology. The 18 sem. hrs. cannot include courses taken already as a specific Biology requirement.

Major in Biology, B.Sc. Degree

General Graduation Requirements

(See also Academic Information section, particularly for further details on core requirements.)

| | Sem. hrs. |
|---|------------|
| Biology (24 sem. hrs. must be 300 or 400 level) | 42 |
| Chemistry (CHEM 103, 104; or 103, 112; or 111, 112; 221, 222) | 12 |
| ENGL 103, 104 | 6 |
| Fine Arts | 3 |
| History | 3 |
| Human Kinetics (incl. HKIN 190) | 4 |
| IDIS 102 | 1 |
| *Mathematics (MATH 123, 124; or MATH 123 plus Computing Sciences or statistics course) | 6 |
| NATS 487, 490 | 3 |
| Philosophy | 3 |
| *PHYS 111, 112 | 6 |
| Religious Studies (incl. RELS 101, 102; Bible content; Christianity & Intercultural Studies) | 12 |
| Society and Culture | 3 |
| UNIV 101 | 1 |
| Electives (a Chemistry minor is particularly recommended; Geology, Computer Science and/or Statistics are also recommended) | 17 |
| Total | 122 |

* Students intending certain education programs may substitute a general mathematics course plus electives.

Specific Requirements

BIOL 113, 114 General Biology
 BIOL 212 or 214 (Vascular plants/Non-vascular Plants or other Botany course)
 BIOL 223 Cell Biology
 BIOL 308, 345, or 360 Zoology
 BIOL 333 or 334 Microbiology
 BIOL 371, 372 Genetics
 BIOL 381 Ecology
 BIOL 384, 386 Biochemistry

Concentration in Biology

Biology: 30 sem. hrs., including:
 BIOL 113, 114 General Biology

BIOL 223 Cell Biology
 BIOL 371 or 372 Introduction to Genetics
 BIOL 381 Ecology

plus 15 sem. hrs. of Biology courses, of which 6 sem. hrs. must be 300 or 400 level, and CHEM 111 and 112; or CHEM 103 and 104. In certain programs (e.g., Kinesiology), BIOL 371 or 372, and 381 requirements may be substituted.

Minor in Biology

The following specific requirements apply: 24 sem. hrs. of Biology (of which 9 sem. hrs. must be 300 or 400 level), including BIOL 113, 114; 223; 371 or 372, and 381; and CHEM 111 and 112; or CHEM 103 and 104. In certain programs (e.g., Kinesiology), BIOL 371 or 372, and 381 requirements may be substituted.

More Information

Contact Admissions or Department chair.

Chemistry

Department of Chemistry
Dr. Craig D. Montgomery, Chair

The Department of Chemistry offers a major in Chemistry, leading to a B.Sc. degree, a concentration, and a minor. Chemistry plays an integral role in the professional preparation of the science student. Graduates of our Chemistry program have found many career opportunities, including advancement into management levels in technology-based industries.

Chemistry is a basic foundation to careers in research, industry, the health sciences, and the environment. The program for graduate school preparation enables a student to continue to an advanced research degree. For industry, students should supplement their program with business courses. For health sciences, the Chemistry major, Life Sciences Emphasis program will provide the prerequisite background.

Within the individual Chemistry courses, there is ample opportunity for breadth of preparation in theory and practice. Following the introduction of general principles and laboratory skills, work is provided in analytical, organic, physical, and inorganic chemistry as well as biochemistry. Seniors are required to do independent projects in chemical problems encountered in testing, research, and development.

The Chemistry Department, located in the Neufeld Science Centre, features new and up-to-date laboratories and equipment. Advanced students are given opportunities to develop their teaching and leadership skills by acting as teaching assistants in first year laboratories under the supervision of a faculty member.

Major in Chemistry, B.Sc. Degree

1. Program for Graduate School Preparation

General Graduation Requirements

(See also Academic Information section, particularly for further details on core requirements.)

| | Sem. hrs. |
|--|------------|
| Chemistry (24 sem. hrs. must be 300 or 400 level) | 45 |
| ENGL 103, 104 | 6 |
| Fine Arts | 3 |
| History | 3 |
| Human Kinetics (incl. HKIN190) | 4 |
| IDIS 102 | 1 |
| MATH 123, 124, 223 | 9 |
| NATS 487 and 490 | 3 |
| One of MATH 250, PHYS 220, or MATH 300 or 400 level | 3 |
| Philosophy (380 suggested, not required) | 3 |
| PHYS 111, 112, 230 | 9 |
| Religious Studies (incl. RELS 101, 102; Bible content; Christianity & Intercultural Studies) | 12 |
| Society and Culture | 3 |
| UNIV 101 | 1 |
| Electives | 17 |
| Total | 122 |

Specific Requirements

CHEM 111, 112* Principles of Chemistry
 CHEM 221, 222 Organic Chemistry
 CHEM 230 Inorganic Chemistry
 CHEM 240 Physical Chemistry
 CHEM 321 Advanced Organic Chemistry
 CHEM 341 Advanced Physical Chemistry
 CHEM 355, 356 Modern Analytical Methods (2+2 sem. hrs.)
 CHEM 409, 410 Senior Thesis
 CHEM 431 Advanced Inorganic Chemistry
 CHEM Electives (11 sem. hrs.)
 *or CHEM 103, 104 with a high grade; or CHEM 103, 112.

2. General Program

General Graduation Requirements

(See also Academic Information section, particularly for further details on core requirements.)

| | Sem. hrs. |
|--|------------|
| Chemistry (24 sem. hrs. must be 300 or 400 level) | 42 |
| ENGL 103, 104 | 6 |
| Fine Arts | 3 |
| History | 3 |
| Human Kinetics (incl. HKIN 190) | 4 |
| IDIS 102 | 1 |
| MATH 123, 124 | 6 |
| NATS 487, 490 | 3 |
| One of MATH 223, CMPT 140, or CMPT 141 | 3-4 |
| Philosophy | 3 |
| PHYS 111, 112 | 6 |
| Religious Studies (incl. RELS 101, 102; Bible content; Christianity & Intercultural Studies) | 12 |
| Society and Culture | 3 |
| UNIV 101 | 1 |
| Electives | 25-26 |
| Total | 122 |

Specific Requirements

CHEM 111, 112* Principles of Chemistry
 CHEM 221, 222 Organic Chemistry
 CHEM 230 Inorganic Chemistry
 CHEM 240 Physical Chemistry
 CHEM 355, 356 Modern Analytical Methods (2+2 sem. hrs.)
 CHEM Electives (20 sem. hrs.)
 *or CHEM 103, 104 with a high grade; or CHEM 103, 112.

3. Life Sciences Emphasis Program

General Graduation Requirements

(See also Academic Information section, particularly for further details on core requirements.)

| | Sem. hrs. |
|--|------------|
| Chemistry (24 sem. hrs. must be 300 or 400 level) | 42 |
| ENGL 103, 104 | 6 |
| Fine Arts | 3 |
| History | 3 |
| Human Kinetics (incl. HKIN 190) | 4 |
| IDIS 102 | 1 |
| MATH 123, 124 | 6 |
| NATS 487, 490 | 3 |
| BIOL 113, 114, 223 | 9 |
| Philosophy | 3 |
| PHYS 111, 112 | 6 |
| Religious Studies (incl. RELS 101, 102; Bible content; Christianity & Intercultural Studies) | 12 |
| Society and Culture | 3 |
| UNIV 101 | 1 |
| Electives | 20 |
| Total | 122 |

Specific Requirements

CHEM 111, 112* Principles of Chemistry
 CHEM 221, 222 Organic Chemistry
 CHEM 230 Inorganic Chemistry
 CHEM 240 Physical Chemistry
 CHEM 384 Principles of Biochemistry
 CHEM 386 Biosynthesis
 CHEM 372 Molecular Genetics
 CHEM Electives (15 sem. hrs.)

*or CHEM 103, 104 with a high grade; or CHEM 103, 112.

Combined Chemistry and Business majors

This combination is ideal for those seeking managerial positions in a technological industry. However, it is very demanding and will sometimes require five years of study. Please consult the Deans in both areas for further details.

Concentration in Chemistry

Chemistry: 30 sem. hrs., including:
 CHEM 111, 112* Principles of Chemistry
 CHEM 221, 222 Organic Chemistry
 CHEM 230, 240 Inorganic Chemistry;
 Physical Chemistry

CHEM 355 Modern Analytical Methods
 (2 sem. hrs.)

plus 10 sem. hrs. of 300 or 400 level Chemistry courses. (CHEM 372 may not be applied towards a concentration in Chemistry.)

*or CHEM 103, 104 with high grade;
 or CHEM 103, 112.

Minor in Chemistry

In addition to the general requirements (see Graduation Requirements section), the following specific requirements apply: 24 sem. hrs. including CHEM 111, 112 (or CHEM 103, 104 with a high grade; or CHEM 103, 112), 221, 230, plus 12 additional sem. hrs. of CHEM electives, 9 sem. hrs. of which must be at a 300 or 400 level. (CHEM 372 may not be applied towards a minor in Chemistry.)

Au Sable Institute Courses

As a service to Biology and Chemistry majors with an interest in environmental studies, several 300 or 400 level courses are available for credit to Trinity Western students through the Au Sable Institute for Environmental Studies in Washington state, the Great Lakes area, Virginia, Africa, and India. These are intensive courses taught primarily during the spring and summer and offer a distinct Christian perspective on the environment. See Enrolment Services for tuition rates. Some financial assistance for travel and housing is available from the Au Sable Institute. See course listings under Environmental Studies. Full details on Institute offerings can be obtained from Professor Steensma, Co-coordinator, Environmental Studies Program.

More Information

Contact Admissions or Department chair.

Computing Science

Department of Mathematical Sciences
Rick Sutcliffe, Chair

The Department of Mathematical Sciences offers a major in Computing Science leading to a B.Sc. degree, with a general emphasis or graduate school preparation emphasis. A concentration and minor

are also offered.

1. Program for Graduate School Preparation

General Graduation Requirements

(See also Academic Information section, particularly for further details on core requirements.)

| | Sem. hrs. |
|--|------------|
| Computer Science (24 sem. hrs. must be 300 or 400 level) | 48 |
| ENGL 103, 104 | 6 |
| Fine Arts | 3 |
| History | 3 |
| Human Kinetics (incl. HKIN190) | 4 |
| IDIS 102 | 1 |
| Laboratory science | 3 |
| MATH 123, 124, 250 | 9 |
| CMPT 480, NATS 490 | 4 |
| Philosophy (PHIL 350 recommended) | 3 |
| Religious Studies (incl. RELS 101, 102; Bible content; Christianity & Intercultural Studies) | 12 |
| Society and Culture (COMM 310 Required) | 3 |
| UNIV 101 | 1 |
| Electives | 22 |
| Total | 122 |

Specific Requirements

CMPT 140 or 143 and 145 or CMPT 141
 CMPT 160 or one or both of CMPT 165, 167
 CMPT 231, 240, 242, 285
 CMPT 409, 410 (Thesis)
 CMPT 480 (fulfils NATS 487 requirement)
 plus additional courses in computing to total 48 sem. hrs., of which at least 30 sem. hrs. must be in 300 or 400 level courses.

Note: 30 sem. hrs. at the upper level is necessary for Education students.

2. General Program

General Graduation Requirements

(See also Academic Information section, particularly for further details on core requirements.)

| | Sem. hrs. |
|--|------------|
| Computer Science (24 sem. hrs. must be 300 or 400 level) | 42 |
| ENGL 103, 104 | 6 |
| Fine Arts | 3 |
| History | 3 |
| Human Kinetics (incl. HKIN190) | 4 |
| IDIS 102 | 1 |
| Laboratory science | 3 |
| MATH 123, 124, (250 recommended) | 6 |
| CMPT 480; NATS 490 | 4 |
| Philosophy (PHIL 350 recommended) | 3 |
| Religious Studies (incl. RELS 101, 102; Bible content; Christianity & Intercultural Studies) | 12 |
| Society and Culture (COMM 310 Required) | 3 |
| UNIV 101 | 1 |
| Electives | 31 |
| Total | 122 |

Specific Requirements

CMPT 140 or 143 and 141 or 145
 CMPT 160 or one or both of CMPT 165, 167
 CMPT 231, 240, 242; 385
 CMPT 480 (fulfils NATS 487 requirement)
 plus additional courses in computing to total 42 sem. hrs., of which at least 24 sem. hrs. must be in 300 or 400 level courses.

Note: a) There are a few Mathematics courses in the Applied Mathematics with Computing Science programs (MATH 330, 350, 430) that are cross-listed as Computing Science, but students are advised that these have significant Mathematics prerequisites. Physics 320 is cross-listed as Computing Science but has significant Physics prerequisites.

b) Business courses cross-listed as ISYS (Information Systems) may not be counted as CMPT courses for the purpose of a major, concentration, or minor in Computing Science. CMPT courses cross-listed as ISYS (Information Systems) must be taken as CMPT courses for Computing Science students. No course may be counted toward both a Computing Science degree and an Information Systems minor, concentration, or major.

c) MATH 100, 101, 102, 120, 150, and CMPT courses numbered below 130 do not count towards a Mathematics, Applied Math-

ematics with Computing Science, or Computing Science major, concentration, or minor.

Concentration in Computing Science

31 sem. hrs. of Computing Science courses, including:

| | sem. hrs. |
|---|-----------|
| CMPT 140, 145, 141 or 143 | 7-8 |
| CMPT 231 and at least one other Computing Science course at the 200 level | 6 |
| CMPT 480 | 3 |

An additional 15 sem. hrs. of Computing Science courses, at least 9 sem. hrs. at the 300 or 400 level _____ 15
 Total 31-32

Other courses:
 None are required, but CMPT 160; MATH 250; COMM 310; and PHIL 103 are recommended.

Note: Cross-listed courses generally have prerequisites in the cross-listed subject area. They may fulfil requirements in only one department at a time and for only one program at a time.

Minor in Computing Science

The following specific requirements apply: 24 sem. hrs. of Computing Science including CMPT 141 (or 143 or 145); one 200 level Computing Science course; and 17 sem. hrs. of other Computing Science courses (of which 9 sem. hrs. must be 300 or 400 level).

Environmental Studies (B.Sc.)

*Faculty of Humanities and Social Sciences
 & Faculty of Natural and Applied Sciences
 Dr. Paul D. Brown and
 Prof. Karen M. M. Steensma, Coordinators*

A multidisciplinary Environmental Studies Program, leading towards a B.Sc. degree, is offered jointly by the Geography Department in the Faculty of Humanities and Social Sciences and the Biology and Chemistry Departments in the Faculty of Natural and Applied Sciences.

Purpose

The mission of the Environmental Studies Program is to equip graduates for the challenges our society faces in the stewardship of creation. Technological and political solutions are being offered by various stakeholders to attempt to meet these challenges, but a Christian worldview of environmental stewardship has much to add to the equation. Various scientific and lay groups are now actually calling for religious communities to contribute creative solutions to environmental problems. This program is designed to develop godly leaders who can offer creative solutions to the difficult task of creation stewardship through our program, involving a rich liberal arts core combined with a multifaceted curriculum including Geography, Biology, and Chemistry.

Perspective

The field of environmental studies involves application of knowledge from many disciplines to issues and questions relating to the sustainability of resource use, degradation caused by pollution and disturbance, and the endangerment of natural systems and species. The environmental field requires knowledge of Biology, Chemistry, Geography, and insights from other disciplines within the natural and social sciences. Knowledge gained from studying the natural sciences is indispensable when dealing with complex questions requiring technical expertise. At the same time, a person working in environmental studies must be able to address the social issues that generally accompany environmental concerns. Thus, an environmental scientist should be knowledgeable in several disciplines, particularly subjects such as conservation biology, environmental chemistry, and land use planning.

Through academic studies and related work and research experience available within the Environmental Studies Program, students will be exposed to a wide variety of environmental issues and methods of studying and caring for creation. Within the academic courses there is an emphasis on field work, whereby students come in direct contact with various environments from Pacific Northwest coastal, forest, and mountain environments as well as tropical environments in Hawaii. Exposure to a wider variety of habitats can be gained by enrolling in courses with the Au Sable Institute of Environmental Studies, which offers courses in Washington state, the Great Lakes area, Virginia, Africa, and India. The Trinity Western University campus includes an ecologically sensitive area that is carefully maintained to serve the program, providing students with ready access to a range of habitats from aquatic pond and river systems to wetlands to mature forests. In addition, the University manages a 75-acre field site on Salt Spring Island (in the B.C. Gulf Islands). This site, known as the Crow's Nest Study Area, serves as a location for summer field courses.

Summer work experience for students within the environmental field is coordinated through the Environmental Studies Program. Each student also completes an environmental studies thesis under the direction of a faculty member. Faculty within the program have been involved in a variety of environmental issues, both professionally and personally. Faculty members are committed to integrating a Christian perspective within the study of the environment. This integration involves recognizing that God calls us to care for the creation that belongs to Him, and that Scripture provides guidelines on how to take care of the earth while at the same time safeguarding humanity as an integral part of creation.

Program

There is an environmental core group of courses to be taken by all students in the Environmental Studies Program. Within the program there are five emphases to choose from: Geography, Chemistry, Organismal Biology, Biochemistry, and Honours Biology. Graduates of the Geography emphasis receive a B.A. in Environmental Studies, while graduates in the other four emphases receive a B.Sc. in Environmental Science.

Environmental core courses (to be taken by all

students in Environmental Studies):

Biology Courses: BIOL 113, 114 (General Biology), BIOL 381 (General Ecology)

Chemistry Courses: CHEM 111, 112 (or 103, 104; or 103, 112) (Introductory Chemistry); CHEM 370 (Environmental Chemistry)

Geography Courses: GEOG 101, 102 (Intro. to Physical Geography); GEOG 280 (Foundations of Cartography and Geographic Information Systems)

Environmental Studies Courses: ENVS/GEOG 252 (Environmental Concerns), ENVS/GEOG 452 (Environment: People and Environment), ENVS 409, 410 (Environmental Studies Thesis)

Field Courses: At least two courses chosen from a variety of offerings available.

Environmental Studies Emphases

Specific details of the three emphases in Biology and the emphasis in Chemistry are listed here. For the details of the Geography Emphasis, see listing under the Faculty of Humanities and Social Sciences.

Biology Emphasis, B.Sc. or B.Sc. Honours Program in Environmental Science

There are three options for completing a Biology Emphasis within the Environmental Studies Program: Organismal Biology, Biochemistry, and Honours Biology. These programs prepare students for careers in environmental science that require a specific knowledge of organisms to be managed or protected, or knowledge of the biochemical implications of toxins or other chemicals in the environment. Students will also be given a framework for applying this specific knowledge to the big picture of the environment, in order to assess complex and long-term dynamics of ecosystems being monitored or restored.

1. Organismal Biology Emphasis

General Graduation Requirements

(See also Academic Information section, particularly for further details on core requirements.)

| | Sem. hrs. |
|--|------------|
| Biology | 24 |
| Chemistry | 9 |
| Geography | 9 |
| Environmental Studies | 9 |
| Field Courses | 6 |
| ENGL 103, 104 | 6 |
| Fine Arts | 3 |
| History | 3 |
| Human Kinetics (incl. HKIN190) | 4 |
| IDIS 102 | 1 |
| MATH 102 | 3 |
| NATS 487, 490 | 3 |
| Philosophy | 3 |
| Religious Studies (incl. RELS 101, 102; Bible content; Christianity & International Studies) | 12 |
| UNIV 101 | 1 |
| Electives | 26 |
| Total | 122 |

Specific Requirements

Required Courses in Biology

BIOL 113, 114 General Biology

BIOL 212 or 214 Vascular or Nonvascular Plants

BIOL 223 Cell Biology

BIOL 381 General Ecology

BIOL 482 Applied Ecology

Two of BIOL 334,

308, or 360 Microbiology, Vertebrate, or Invertebrate Zoology

Required Courses in Chemistry

CHEM 111, 112 Introductory Chemistry (or 103, 104; or 103, 112)

CHEM 370 Environmental Chemistry

Required Courses in Geography

GEOG 101, 102 Introduction to Physical Geography

GEOG 280 Foundations of Cartography and Geographic Information Systems

Required Courses in Environmental Studies

- ENVS 252 Environmental Concerns
 ENVS 452 Seminar: People and Environment
- ENVS 409, 410 Thesis
- Required Field Courses
 6 sem. hrs. choose from:
 BIOL 316 Plant Ecology
 BIOL 318 Tropical Botany
 BIOL 364 Coral Reef Biology
 BIOL 382 Marine Ecology
 GEOG 384 Field Methods

These courses may be replaced with appropriate Au Sable Institute field courses approved by the faculty of the Environmental Studies Program.

Required Courses in Mathematics

- MATH 102 Statistics

Suggested Electives

- CHEM 221, 222 Organic Chemistry
 CHEM 355, 366 Analytical Chemistry
 CMPT 100-127 Computer Science (Literacy and Modules)
 GEOG 352 Urban Environments
 GEOG 390 Geographic Information Systems
 GEOG 466 Land Use Planning
 PHYS 111, 112 Physics

Advanced Biology courses (BIOL 333; 371, 372; 384, 386, or appropriate Au Sable Institute offerings)

2. Biochemistry Emphasis

General Graduation Requirements

(See also Academic Information section, particularly for further details on core requirements.)

| | Sem. hrs. |
|--|------------|
| Biology | 18 |
| Chemistry | 15 |
| Geography | 9 |
| Environmental Studies | 9 |
| Field Courses | 6 |
| ENGL 103, 104 | 6 |
| Fine Arts | 3 |
| History | 3 |
| Human Kinetics (incl. HKIN190) | 4 |
| IDIS 102 | 1 |
| MATH 102 | 3 |
| NATS 487, 490 | 3 |
| Philosophy | 3 |
| Religious Studies (incl. RELS 101, 102; Bible content; Christianity & Intercultural Studies) | 12 |
| UNIV 101 | 1 |
| Electives | 26 |
| Total | 122 |

Specific Requirements

Required Courses in Biology

- BIOL 113, 114 General Biology
 BIOL 223 Cell Biology
 BIOL 384 Principles of Biochemistry
 BIOL 381 General Ecology
 BIOL 482 Applied Ecology

Required Courses in Chemistry

- CHEM 111, 112 Introductory Chemistry (or 103, 104; or 103, 112)
 CHEM 221, 222 Organic Chemistry
 CHEM 370 Environmental Chemistry

Required Courses in Geography

- GEOG 101, 102 Introduction to Physical Geography
 GEOG 280 Introduction to Cartography and Geographic Information Systems

Required Courses in Environmental Studies

- ENVS 252 Environmental Concerns
 ENVS 452 Seminar: People and Environment

ENVS 409, 410 Thesis

Required Field Courses

6 sem. hrs. choose from:

- BIOL 316 Plant Ecology
- BIOL 318 Tropical Botany
- BIOL 364 Coral Reef Biology
- BIOL 382 Marine Ecology
- GEOG 384 Field Methods

These courses may be replaced with appropriate Au Sable Institute field courses approved by the faculty of the Environmental Studies Program.

Required Courses in Mathematics

- MATH 102 Statistics

Suggested Electives

- CHEM 355, 366 Analytical Chemistry
- CMPT 100-127 Computing Science (Literacy and Modules)
- GEOG 352 Urban Environments
- GEOG 390 Geographic Information Systems
- GEOG 466 Land Use Planning
- PHYS 111, 112 Physics

Advanced Biology courses (BIOL 308, 312, 314, 333, 334, 360, 371, 372, 386, or appropriate Au Sable Institute offerings)

3. Honours Biology Emphasis

The honours emphasis allows Environmental Studies students to become versed in both organismal and biochemical branches of Biology. Admission to the program requires a cumulative GPA of 3.0, which must be maintained in all Biology courses. An overall cumulative GPA of 2.7 is required for graduation in the program. Students must complete 134 sem. hrs. for graduation.

Prospective candidates for the honours program will normally apply for admission at the end of their second year (at TWU or elsewhere), though admission will be possible during either semester of the third year. Applications should be made by November 30 or March 31 during the semester prior to admission.

General Graduation Requirements

(See also Academic Information section, particularly for further details on core requirements.)

| | Sem. hrs. |
|--|-------------|
| Biology | 27 |
| Chemistry | 15 |
| Geography | 9 |
| Environmental Studies | 9 |
| Field Courses | 9 |
| ENGL 103, 104 | 6 |
| Fine Arts | 3 |
| History | 3 |
| Human Kinetics (incl. HKIN190) | 4 |
| IDIS 102 | 1 |
| MATH 102 | 3 |
| NATS 487, 490 | 3 |
| Philosophy | 3 |
| Religious Studies (incl. RELS 101, 102; Bible content; Christianity & International Studies) | 12 |
| UNIV 101 | 1 |
| Electives | 26 |
| Total | 134* |

*Upper level sem. hrs. must total 54.

Specific Requirements

Required Courses in Biology

- BIOL 113, 114 General Biology
- BIOL 223 Cell Biology
- BIOL 384 Principles of Biochemistry
- BIOL 334 Basic and Applied Microbiology
- BIOL 381 General Ecology
- BIOL 482 Applied Ecology
- 1 of BIOL 312 or 314 Vascular or Nonvascular Plants
- 1 of BIOL 308 or 360 Vertebrate or Invertebrate Zoology

Required Courses in Chemistry

- CHEM 111, 112 Introductory Chemistry (or 103, 104; or 103, 112)
- CHEM 221, 222 Organic Chemistry
- CHEM 370 Environmental Chemistry

Required Courses in Geography

- GEOG 101, 102 Introduction to Physical Geography
- GEOG 280 Foundations of Cartography and Geographic Information

Systems

Required Courses in Environmental Studies

- ENVS 252 Environmental Concerns
- ENVS 452 Seminar: People and Environment
- ENVS 409, 410 Thesis

Required Field Courses

9 sem. hrs. choose from:

- BIOL 316 Plant Ecology
- BIOL 318 Tropical Botany
- BIOL 364 Coral Reef Biology
- BIOL 382 Marine Ecology
- GEOG 384 Field Methods

These courses may be replaced with appropriate Au Sable Institute field courses approved by the faculty of the Environmental Studies Program.

Required Courses in Mathematics

- MATH 102 Statistics

Suggested Electives

- CHEM 355, 366 Analytical Chemistry
- CMPT 100-127 Computing Science (Literacy and Modules)
- GEOG 352 Urban Environments
- GEOG 390 Geographic Information Systems
- GEOG 466 Land Use Planning
- PHIL 380 Philosophy of Science
- PHYS 111, 112 Physics

Advanced Biology courses (BIOL 333; 371, 372; 384, 386, or appropriate Au Sable Institute offerings)

4. Chemistry Emphasis, B.Sc. in Environmental Science

Much of the technological achievement in the world owes its success to research in applied chemistry. The standard of living enjoyed in developed countries is largely dependent on technology, but this same standard of living is responsible for much of the pollution plaguing our environment. The Chemistry emphasis prepares students for addressing these challenges in their career paths by establishing their knowledge of chemical processes and involving themselves in issues where chemistry matters.

General Graduation Requirements

(See also Academic Information section, particularly for further details on core requirements.)

| | Sem. hrs. |
|--|------------|
| Chemistry | 19 |
| Biology | 9 |
| Geography | 9 |
| Environmental Studies | 9 |
| Field Courses | 6 |
| ENGL 103, 104 | 6 |
| Fine Arts | 3 |
| History | 3 |
| Human Kinetics (incl. HKIN190) | 4 |
| IDIS 102 | 1 |
| MATH 102, 123 | 6 |
| NATS 487, 490 | 3 |
| Philosophy | 3 |
| Religious Studies (incl. RELS 101, 102; Bible content; Christianity & International Studies) | 12 |
| UNIV 101 | 1 |
| Electives | 28 |
| Total | 122 |

Specific Requirements

Required Courses in Chemistry

- CHEM 111, 112 Introductory Chemistry (or 103, 104 or 103, 112)
- CHEM 221, 222 Organic Chemistry
- CHEM 355, 356 Analytical Chemistry
- CHEM 370 Environmental Chemistry

Required Courses in Biology

- BIOL 113, 114 General Biology
- BIOL 381 General Ecology

Required Courses in Geography

- GEOG 101, 102 Introduction to Physical Geography
- GEOG 280 Foundations of Cartography and Geographic Information Systems

Required Courses in Environmental Studies

- ENVS 252 Environmental Concerns
 - ENVS 409, 410 Thesis
 - ENVS 452 Seminar: People and Environment
- Required Field Courses

6 sem. hrs. choose from:

- BIOL 316 Plant Ecology
- BIOL 318 Tropical Botany
- BIOL 364 Coral Reef Biology

BIOL 382 Marine Ecology
 GEOG 384 Field Methods

These courses may be replaced with appropriate Au Sable Institute field courses approved by the faculty of the Environmental Studies Program.

Required Courses in Mathematics

MATH 123, 102 Calculus, Statistics

Suggested Electives

BIOL/ CHEM 384 Principles of Biochemistry

BIOL 482 Applied Ecology

CMPT 100-127 Computing Science
 (Literacy and Modules)

GEOG 352 Urban Environments

GEOG 390 Geographic Information Systems

GEOG 466 Land Use Planning

PHYS 111, 112 Physics

Advanced Chemistry courses (CHEM 230; 240; 321, 322; 341, 352; 431, 432; 469)

Note: MATH 124 will be required if Physical Chemistry courses are taken as options.

Information Systems (ISYS)

Department of Mathematical Sciences

Dr. John Byl, Chair

Prof. Rick Sutcliffe, Coordinator

The Department of Mathematical Sciences offers a minor in Information Systems (ISYS). The following specific requirements apply:

| | Sem. hrs. |
|--|-----------|
| ISYS/CMPT 101, 112, 122, 125, 127 Literacy and applications 3-5 | |
| ISYS/CMPT 140 Intro. Programming | 3 |
| ISYS/CMPT 160 Object Oriented Programming Concepts | 1 |
| ISYS/CMPT 165 or 167 Intro to C++ or Java | 2 |
| ISYS/CMPT 237 Files and Databases | 3 |
| ISYS/CMPT 325 Networking | 3 |
| ISYS/BUSI 371* or ISYS/CMPT 385^ Systems Analysis/Software Engineering | 3 |
| ISYS/BUSI 377 Management Science | 3 |
| ISYS/BUSI 490* or ISYS/CMPT 386^ ISYS/SE Project | 3-4 |

plus additional Information Systems courses as necessary taken from the following to total 24 sem. hrs., of which at least 9 sem. hrs. must be in 300 or 400 level courses and have not already been counted toward a major:

| | |
|---|---|
| ISYS/BUSI 370* Business and Information Systems | 3 |
| ISYS/CMPT 480 Ethical and Social Issues | 3 |
| ISYS/CMPT 400 Directed Studies | 3 |

*Business majors

^Option for other majors

Note: The first group could total 24 sem. hrs. or more,

but some students may not require certain of the 100 level courses. All Business majors are required to have taken BUSI 370 already.

Mathematics

Department of Mathematical Sciences

Dr. John Byl, Chair

The Department of Mathematical Sciences offers a major in Mathematics, leading to a B.Sc. degree, with either graduate school preparation or general emphasis. A concentration and a minor are also offered.

Major in Mathematics, B.Sc. Degree

1. Program for Graduate School Preparation

General Graduation Requirements

(See also Academic Information section, particularly for further details on core requirements.)

| | Sem. hrs. |
|--|------------|
| Mathematics (30 sem. hrs. must be 300 or 400 level) | 48 |
| CMPT 141, 143; or 140, 145 | 4-5 |
| ENGL 103, 104 | 6 |
| Fine Arts | 3 |
| History | 3 |
| Human Kinetics (incl. HKIN190) | 4 |
| IDIS 102 | 1 |
| MATH 480 | 3 |
| NATS 490 | 1 |
| Philosophy | 3 |
| PHYS 111, 112 | 6 |
| Religious Studies (incl. RELS 101, 102; Bible content; Christianity and Intercultural Studies) | 12 |
| Society and Culture | 3 |
| UNIV 101 | 1 |
| Electives | 23-24 |
| Total | 122 |

Specific Requirements

MATH 123, 124 Calculus I & II

MATH 220 Analysis

MATH 223 Calculus III

MATH 240 Discrete Mathematics

| | |
|---------------|---|
| MATH 250 | Linear Algebra |
| MATH 370 | Modern Geometry |
| MATH 380 | Abstract Algebra |
| MATH 409, 410 | Senior Thesis |
| MATH 480 | Foundations of Mathematical Sciences (fulfils NATS 487 and IDIS 400 requirements) |

plus additional courses in Mathematics to a total of 48 sem. hrs., of which at least 30 sem. hrs. must be at the 300 or 400 level.

2. General Program

General Graduation Requirements

(See also Academic Information section, particularly for further details on core requirements.)

| | Sem. hrs. |
|--|------------|
| Mathematics (24 sem. hrs. must be 300 or 400 level) | 42 |
| CMPT 141 or 143; or 140, 145 | 4-5 |
| ENGL 103, 104 | 6 |
| Fine Arts | 3 |
| History | 3 |
| Human Kinetics (incl. HKIN190) | 4 |
| IDIS 102 | 1 |
| Laboratory science (PHYS 111 recommended) | 3 |
| MATH 480 | 3 |
| NATS 490 | 1 |
| Philosophy (PHIL 350 recommended) | 3 |
| Religious Studies (incl. RELS 101, 102; Bible content; Christianity & Intercultural Studies) | 12 |
| Society and Culture | 3 |
| UNIV 101 | 1 |
| Electives | 32-33 |
| Total | 122 |

Specific Requirements

| | |
|---------------|----------------------|
| MATH 123, 124 | Calculus I & II |
| MATH 220 | Analysis |
| MATH 223 | Calculus III |
| MATH 240 | Discrete Mathematics |
| MATH 250 | Linear Algebra |

| | |
|----------|---|
| MATH 370 | Modern Geometry |
| MATH 380 | Abstract Algebra |
| MATH 480 | Foundations of Mathematical Sciences (fulfils NATS 487 and IDIS 400 requirements) |

plus additional courses in Mathematics to a total of 42 sem. hrs., of which at least 24 sem. hrs. must be at the 300 or 400 level.

Note: MATH 100, 101, 102, 120, 150, and CMPT courses numbered below 130 do not count towards a Mathematics, Applied Mathematics with Computing Science, or Computing Science major, concentration, or minor.

Concentration in Mathematics

Mathematics: 30 sem. hrs., including:

MATH 123, 124 Calculus I and II

MATH 223 Calculus III

plus 21 sem. hrs. of Mathematics courses, of which 12 sem. hrs. must be 300 or 400 level courses.

Minor in Mathematics

(see General Graduation Requirements section), the following specific requirements apply: 24 sem. hrs. Mathematics (of which 9 sem. hrs. must be 300 or 400 level), including MATH 123, 124, and 223.

Natural and Applied Sciences

*Faculty of Natural and Applied Sciences
Dr. J. D. (Jack) Van Dyke, Coordinator*

The Faculty of Natural and Applied Sciences offers a Multidisciplinary Natural and Applied Sciences major with: 1) a concentration in one science area; 2) a minor in a second area; and 3) at least 6 sem. hrs. in a third area, chosen from BIOL 113 or 114; CHEM 103 or 104, 103, 112 or 111 or 112; GEOL 109; MATH 123, 124; or PHYS 111, 112. It is also possible to gain a multidisciplinary major with concentrations in two areas; for example: Biology and Chemistry, Chemistry and Mathematics, etc.

General Graduation Requirements

(See Academic Information section, particularly for further details on core requirements.)

| | Sem. hrs. |
|--|------------|
| Natural Science | 60 |
| ENGL 103, 104 | 6 |
| Fine Arts | 3 |
| History | 3 |
| Human Kinetics (incl. HKIN 190) | 4 |
| IDIS 102 | 1 |
| NATS 487, 490 | 3 |
| Philosophy | 3 |
| Religious Studies (incl. RELS 101, 102; Bible content; Christianity & Intercultural Studies) | 12 |
| Society and Culture | 3 |
| UNIV 101 | 1 |
| Electives | 23 |
| Total | 122 |

Specific Requirements

Biology, Chemistry, Mathematics, Computing Science, Applied Mathematics with Computing Science, and Physics concentrations may be found in the listings under individual departments.

Nursing

Department of Nursing
Prof. Barbara Pesut, Chair

The Department of Nursing offers a major in Nursing, leading to a B.Sc.N. degree.

The Nursing program prepares graduates to provide health promotion and restorative care for all ages, in diverse settings, and with special emphasis on community and transcultural nursing. Nursing courses are designed to help students address the needs of the whole person, including biological, psychological, and spiritual dimensions. The focus of providing care is to develop health-seeking behaviours in individuals, families, groups, and communities.

The liberal arts foundation of the Bachelor of Science in Nursing (B.Sc.N.) provides the basis for developing the whole person. Courses in religious studies, English, aesthetics, and the social sciences all contribute to helping Nursing students develop a sound worldview and perspective, as well as values important in interpersonal relations. This background is integrated into the whole Nursing Program so students can think creatively and biblically about the world.

Nursing courses are sequential. Therefore, first year Nursing and science courses must be successfully completed before students may progress to Nursing courses designated for subsequent years. Students will have opportunities to develop their clinical skills in the on-campus nursing skills lab and in off-campus clinical sites. Students may also expand their transcultural insight, perceptiveness, and competence by including optional transcultural clinical experiences.

(Graduation requirements, next page)

Major in Nursing, B.Sc.N. Degree

General Graduation Requirement

(See also Academic Information section, particularly for further details on core requirements.)

| | Sem. hrs. |
|--|------------|
| *Nursing | 61 |
| *BIOL 333 | 3 |
| *BIOL 241 and 242; or 243 and 244 | 6 |
| ENGL 103, 104 | 6 |
| Fine Arts | 3 |
| History | 3 |
| Human Kinetics activity course | 1 |
| IDIS 102 and 400 or approved alternative | 4 |
| MATH 102 | 3 |
| NURS 111 | 3 |
| Philosophy | 3 |
| PSYC 106, 211 | 6 |
| Religious Studies (incl. RELS 101, 102; Bible content; Christianity & Intercultural Studies) | 12 |
| Sociology | 3 |
| UNIV 101 | 1 |
| Electives | 4 |
| Total | 122 |

*NB: A minimum grade of C is required in these courses.

Specific Requirements

| | |
|----------|---|
| NURS 111 | Health and Lifestyle |
| NURS 116 | Health Assessment and Nursing Care |
| NURS 121 | Nursing Concepts |
| NURS 124 | Communication and Health Teaching |
| NURS 222 | Pharmacology |
| NURS 245 | Nursing Care of Older Adults |
| NURS 252 | Nursing Care of Childbearing Family |
| NURS 321 | Nutrition |
| NURS 332 | Nursing Research |
| NURS 351 | Nursing Care and Mental Health |
| NURS 362 | Nursing Care of Children and Families |
| NURS 402 | Nursing Care in Transcultural Area (optional) |
| NURS 437 | Nursing Theories & Issues |
| NURS 463 | Nursing Care of Adults in Complex Illness |

| | |
|----------|-------------------------------------|
| NURS 465 | Nursing Care of Adults in Community |
| NURS 482 | Consolidation in Nursing Practice |
| NURS 484 | Leadership in Nursing Care |

Note: In all Nursing courses, students must have a minimum grade of C; a cumulative C+ average in Nursing courses is required for progression.

Nursing courses must be taken in sequential order—Year 1 courses followed by Year 2, etc.

More Information

Contact Admissions or the Department Chair.

Physics

Department of Mathematical Sciences

Dr. John Byl, Chair

Dr. Bob Wood, Coordinator

The Department of Mathematical Sciences offers a concentration and minor in Physics.

Concentration in Physics

The following specific requirements apply: 30 sem hrs., of Physics including:

PHYS 111, 112 Fundamentals of Physics

PHYS 220 Mechanics

PHYS 230 Electricity and Magnetism

PHYS 240 Physical Chemistry

plus 15 sem. hrs. of Physics courses, 12 sem. hrs. of which must be 300 or 400 level.

Minor in Physics

The following specific requirements apply: 24 sem. hrs. of Physics (of which 9 sem. hrs. must be 300 or 400 level), including PHYS 111, 112.

Facilities

TWU has machines running MacOS, Windows NT Client, and UNIX. Small labs are set aside for senior students as well. Modula-2 is used for introductory programming courses, and other languages are employed as appropriate in later courses. The Department's goal is to graduate widely computer-literate students who can use many tools and systems and who are problem-solving software engineers by profession.

More Information

Contact Admissions or Department coordinator.

Pre-Professional Studies (Sciences)

Faculty of Natural and Applied Sciences

Dr. Jack Van Dyke, Coordinator

In addition to the major programs, students may study in various pre-professional programs including:

1. Pre-Medicine

Students planning to enter the field of medicine may take their full pre-medicine program at Trinity Western. Due to very restricted enrolments in medical schools, students are encouraged to select a course of studies which will lead to a degree in their area of interest. Each medical school has specific requirements for entrance; however, requirements normally include the following:

BIOL 113, 114; 223; 384, 386

CHEM 111, 112
(or 103, 104; or 103, 112); 221, 222

ENGL 103, 104

MATH 123, 124; or 123, 102

PHYS 111, 112

2. Pre-Dentistry

Normally students are required to complete three academic years towards a baccalaureate degree, including classes in the humanities and social sciences. Specific requirements for many dental schools include the following:

BIOL 113, 114; 384, 386

CHEM 111, 112 (or 103, 104; or 103, 112);
221, 222

ENGL 103, 104

MATH 123, 124; or 123, 102

PHYS 111, 112

3. Pre-Engineering

Most universities no longer require a pre-engineering year. Although it is often possible to transfer into engineering programs after a year of studies at Trinity Western, students are advised to consult the engineering department at the university of their choice as to its specific transfer policy. Normally the following courses are required:

CHEM 111, 112
(or CHEM 103, 104; or CHEM 103, 112)

ENGL 103, 104

MATH 123, 124

PHYS 111, 112

plus 6 sem. hrs. of appropriate electives.

4. Pre-Veterinary Medicine

Normally two years of study are required for admission to a school of veterinary studies, and with Trinity Western University's curriculum, you will be able to complete your requirements here. Admission to the Western College of Veterinary Medicine (at Saskatoon), for example, requires:

BIOL 113, 114; 333 or 334; 384, 386, 371

ENGL 103, 104

CHEM 111, 112; or CHEM 103, 104, or
CHEM 103, 112; 221, 222

MATH 123, 124; or 123, 102

PHYS 111, 112

Electives: 15 sem. hrs. (i.e. sufficient to complete two full years).

FACULTY OF PROFESSIONAL STUDIES AND PERFORMING ARTS

Prof. Linda Schwartz, Acting Dean