



Major Program Modifications

UOIT Forensic Science Program

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FORENSIC SCIENCE: MAJOR PROGRAM MODIFICATION

1. Introduction

a. Background on existing program

Forensic Science is an emerging interdisciplinary area of science that includes elements of social science and involves the use of scientific principles to analyze evidence for legal investigations. The BSc (Honours) in Forensic Science program is distinguished by a strong scientific foundation in biology and chemistry, with allied courses related to forensic aspects of identification, toxicology, psychology and law. The first year of the program has two courses in each of biology, chemistry, calculus, and physics. This provides students with a basic grounding in the core science disciplines, both in order to prepare them for future scientific developments in any area they choose to pursue, and also to provide the flexibility for selecting different scientific specializations in the upper years of study. By an appropriate selection of elective courses during their program, students may acquire deeper knowledge of either chemistry or biology, providing them with opportunities inherent in typical programs in these areas, including post-degree and graduate studies.

Learning occurs via classroom lectures, tutorials, laboratories, computer simulations and via independent research. Learning and teaching take place in the University's Mobile Learning Program, wherein each student uses a laptop computer equipped with software integrated into the teaching of the courses, within a wireless campus environment. Students study in state-of-the-art laboratories and classrooms, and benefit from Science professors who teach using tablet computers.

b. Rationale for new program components

In May 2007 the UOIT Forensic Science Advisory Committee was established, consisting of prominent members of the forensic community. The Committee has as its goal to guide, strengthen and improve the overall UOIT Forensic Science undergraduate educational experience. Through annual meetings, committee members provide assessment and counsel on curriculum and technology as well as assistance in securing mentors and internships for 4th year thesis students. As a whole the committee promotes the program within the community by communicating with society leaders and presenting outreach programs to local groups.

The following was discussed at the most recent UOIT Forensic Science Advisory Committee meeting, in May 2011. The focus of the Forensic Science program at UOIT is to give students a strong science foundation in all of the natural sciences, and to specialize in chemistry and biology in the senior years of the program. It was envisioned that the expertise in both biology and chemistry would increase the student's opportunities upon graduation. While this is the case for some students, it does inhibit those who wish to specialize further in a specific discipline. A recommendation was made at the recent advisory committee meeting to consider offering specializations within the forensic science program, one in forensic biology, one in forensic chemistry, as well as possible other specializations. Another suggestion that was made by the Committee was the addition of new forensic science courses in areas

that the Committee felt represented gaps in the current Forensic Science Program Map. These courses included population genetics, advanced forensic biology, and an additional advanced forensic chemistry related course.

These suggestions have been seriously considered and steps are now being taken to implement these recommendations. Moreover, the proposed new courses and new specializations will place the UOIT Forensic Science Program in line with existing accredited forensic science programs such as those offered at John Jay College of Criminal Justice and The George Washington University.

c. Overview of new program components

Currently the Forensic Science Program provides a major in Forensic Science. With the addition of two upper-year courses, it is also possible to obtain a double-minor in Biology and Chemistry. We are proposing making minor changes to the program map so that, in addition to a major in Forensic Science, students would be required to obtain further knowledge in a specialization of their choice, Forensic Biology, Forensic Chemistry, Forensic Physics, or Forensic Psychology. The students would be required to gain at least 18 credit hours of study in their chosen specialization. The program map will be altered to accommodate each specific specialization.

d. How the new program components fit into broader array of program offerings

The new specializations will support the existing programs in the Faculty of Science as well as create greater links with the Bachelor of Arts in Forensic Psychology offered in the Faculty of Social Science and Humanities. This will allow for the inclusion of specialised forensic science courses already offered in the Faculty of Science, such as Forensic Physics (PHYS 4120) and Digital Evidence (CSCI 4120), by opening these courses to our forensic science students, thus increasing enrolment in these courses.

Three courses required to support the new specializations are being proposed. These include FSCI 3110 Population Genetics and FSCI 4120 Advanced Forensic Biology offered in the Biology specialization, and FSCI 4040 Fire Investigation which would be required in the Chemistry specialization. These additional specialised courses would fill a gap in our current program map.

A fourth course, FSCI 4460 Mock Crime Scene Practicum, available to all Forensic Science students has also been proposed to run concurrently with FSCI 4430 Directed Studies. This course would be available to those students who prefer to gain practical experience, but may not have achieved the required grade point average (2.7 or above) to undertake an honours thesis.

The Bachelor of Arts in Forensic Psychology is a rapidly growing degree, with enrolment in excess of 150 students. Their program map already includes a forensic science course, FSCI 1010 Introductory Forensic Science, and have cross-listed PSYC 3210 Forensic Psychology with FSCI 3210 (formerly FSCI 4010) Forensic Psychology. As a result of greater collaborations, they are currently reviewing their program map to include a new course proposed by Forensic Science, FSCI 2020 Essential of Crime Scene Science. Since these two programs have been creating shared links, it seems logical for the Forensic Science Program to propose a specialization in Psychology.

A specialization in Computer Science is being considered; however, could not be included in this proposal as the new program map for this particular specialization still requires some work.

The UOIT Forensic Science Program follows guidelines provided by the American Academy of Forensic Sciences (AAFS) – Forensic Science Education Programs Accreditation Commission (FEPAC). The current program provides one of the strongest science foundations of any forensic science program in Canada. The proposed program map still falls under the guidelines for FEPAC accreditation. We are currently in the process of applying for accreditation through FEPAC.

e. Career and academic opportunities

Graduates of the UOIT Forensic Science Program will be poised to continue their studies in forensic science as well as biology, chemistry, physics, or psychology. The benefit of these new specializations will be evident as the graduates enter the workforce. Forensic science laboratories are divided into individual sections according to the different scientific disciplines. The new specializations will allow the students to gain additional knowledge and experience in a specialisation of choice, making them more qualified for the specific sections.

2. Degree Requirements

a. Program learning outcomes

Program Level Learning Outcomes	Program Requirements that contribute to the outcome
1. Depth and breath of knowledge	<ul style="list-style-type: none"> • Student will apply in depth knowledge and critical understanding of chemistry and biology to identify, evaluate, analyse and interpret information and hypotheses relative to forensic science. • Student will gain an interdisciplinary knowledge within the field of forensic science by having the opportunity to further specialise in the fields of biology, chemistry, physics, or psychology.
2. Knowledge of methodologies	<ul style="list-style-type: none"> • Student will critically evaluate and describe the principles, concepts, theories and assumptions that form the foundation of forensic science.
3. Application of knowledge	<ul style="list-style-type: none"> • Student will utilise independent learning and analytical skills to solve problems specific to forensic science and broader issues outside the discipline. • Formulate and conduct research or equivalent advanced scholarship in forensic science or a related discipline.
4. Communication skills	<ul style="list-style-type: none"> • Student will be able to communicate accurately and effectively in written and oral form with members of academia, government and industry, as well as the general public on matters related to the legal applications of science.
5. Awareness of limits of knowledge	<ul style="list-style-type: none"> • Student will recognize the limitations of the current state of knowledge in forensic science and appreciate the need to adapt to new and emerging technologies in the field.

6. Autonomy and professional capacity	<ul style="list-style-type: none"> • Student is expected to become an active member of multidisciplinary and multicultural teams and appreciate the importance of academic integrity, professional ethical conduct, and social responsibility. • Student will pursue further scholarly pursuits, employment, and community involvement to advance the knowledge base in forensic science and contribute towards the economic and societal growth of the community.
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b. Admission requirements

All first year science programs, including Forensic Science, share the same entrance requirements. The admission requirements are described specifically for Ontario secondary institutions, however these requirements also apply to students from out of province.

Current Ontario secondary school students must complete the Ontario Secondary School Diploma (OSSD) with a minimum overall average of 70 per cent on six 4U or 4M credits including English (ENG4U), advanced functions (MHF4U), and two of physics (SPH4U), chemistry (SCH4U), biology (SBI4U), or calculus and vectors (MCV4U). In addition, a combined minimum 70 per cent average in math and science courses is required.

No changes to the admission requirements will be made to accommodate the new proposed program maps.

c. Program structure

Forensic Science Core Course

Students will be required to take core Forensic Science (FSCI) courses in order to satisfy their major in Forensic Science. These include: FSCI 1010 Introductory Forensic Science, FSCI 2010 Crime Scene Science, FSCI 3010 Criminalistics I, FSCI 3030 Criminalistics II, FSCI 3120 Forensic Biology, FSCI 4030 Forensic Drug Chemistry and Toxicology, FSCI 4020 Interdisciplinary Topics in Forensic Science, and FSCI 4410 Thesis Project in Forensic Sciences or a senior elective.

Additional Core Course

As the Forensic Science Program is designed as a science intensive degree, students will be required to take additional Biology (BIOL) and Chemistry (CHEM) courses throughout all four years of their degree. It is important that students have a strong knowledge of both biological and chemical sciences in order to support the core forensic science courses. The full list of courses can be found in section *d. Program Content*.

Courses required for the Program Specializations

Additional 3000 and 4000 level courses, along with tailored forensic science courses in the chosen field of specialisation will make-up the specializations. The specializations include: biology, chemistry, physics, and psychology. These are described in detail in section *d. Program Content*, sub-section *Program Maps for Each Proposed Specialization*.

Electives

Students will be able to take electives starting in the third year of their degree. They will be encouraged to take additional courses related to their specialization of choice. The proposed specializations will provide the students with more flexibility and allow them to choose from several courses suggested in the program maps specific to each specialization.

d. Program content

Degree Requirements

To be eligible for the BSc (Hons) degree in Forensic Science, students must successfully complete 120 credit hours, including all courses outlined in the following program map. Depending on the chosen specialization, there will be different requirements to satisfy the program. The changes made to the original Forensic Science Program Map are indicated by a star (*). Each specialization is described in more detail in the following section, *Program Maps for the Proposed Specializations*.

Students will be required to declare their specialization of study by the end of the Fall semester of their first year.

New Forensic Science Program Map

YEAR 1

Semester 1 (15 credit hours)

BIOL 1010U Biology I
CHEM 1010U Chemistry I
CSCI 1040U Introduction to Computer Science with Python
MATH 1000U Introductory Calculus or
MATH 1010U Calculus I
PHY 1030U Introductory Physics or
*PHY 1010U Physics I for Physics Specialization

Semester 2 (15 credit hours)

BIOL 1020U Biology II
CHEM 1020U Chemistry II
FSCI 1010U Introductory Forensic Science
MATH 1020U Calculus II
PHY 1040U Physics for Biosciences or
*PHY 1020U Physics II for Physics Specialization

YEAR 2

Semester 1 (15 credit hours)

BIOL 2010U Introductory Physiology
BIOL 2030U Cell Biology
CHEM 2020U Introduction to Organic Chemistry
FSCI 2010U Crime Scene Science
STAT 2020U Statistics and Probability for Biological Science

Semester 2 (15 credit hours)

BIOL 2020U Genetics and Molecular Biology
BIOL 2080U Biochemistry I
BIOL 2050U Human Anatomy
CHEM 2120U Organic Chemistry
*BIOL, CHEM, PHY, or PSYC course relevant to specialization

YEAR 3**Semester 1 (15 credit hours)**

BIOL 3020U Principles of Pharmacology and Toxicology

CHEM 2030U Analytical Chemistry

FSCI 3010U Criminalistics I

*BIOL, CHEM, PHY, or PSYC course relevant to specialization

Elective

Semester 2 (15 credit hours)

FSCI 3030U Criminalistics II

FSCI 3040U Forensic Chemistry

FSCI 3120U Forensic Biology

*BIOL, CHEM, PHY, or PSYC course relevant to specialization

Elective

YEAR 4**Semester 1 (15 credit hours)**

FSCI 4020U Interdisciplinary Topics in Forensic Science

FSCI 4030U Forensic Drug Chemistry and Toxicology

FSCI 4410U Forensic Science Thesis Project in Forensic Science or Senior elective relevant to specialization

*BIOL, CHEM, PHY, or PSYC course relevant to specialization

Elective

Semester 2 (15 credit hours)

FSCI 4050U Law for Forensic Scientists

FSCI 4420U Forensic Science Thesis Project in Forensic Science or Senior elective relevant to specialization

*BIOL, CHEM, PHY, or PSYC courses relevant to specialization

Two Elective

Program Maps for Each Proposed Specialization

The students will have a choice of one of four specializations which include Biology, Chemistry, Physics, or Psychology. The different specializations are listed and explained below. The **bolded** sections in each table indicate the differences between the program maps and thus represent what is unique for each specialization. Three new courses are being proposed to allow the students to fulfil the requirements in the Biology and Chemistry specializations. These include FSCI 3110 Population Genetics, FSCI 4120 Advanced Forensic Biology, FSCI 4040 Fire Investigations and can be found in Appendix 1.

Bachelor of Science (Honours) in Forensic Science Program Map - Biology

Year-Sem.	Subject	Subject	Subject	Subject	Subject
1-1	Chemistry I CHEM1010U	Biology I BIOL1010U	Physics I PHY1010U OR Introductory Physics PHY1030U	Introductory Calculus MATH 1000U OR Calculus I MATH1010U	Introduction to Computer Science with Python CSCI1040U
1-2	Chemistry II CHEM1020U	Biology II BIOL1020U	Physics for Biosciences PHY1040U	Calculus II MATH1020U	Introductory Forensic Science FSCI1010U
2-1	Introductory Physiology BIOL2010U	Cell Biology BIOL2030U	Introduction to Organic Chemistry CHEM2020U	Statistics and Probability for Biological Science STAT2020U	Crime Scene Science FSCI2010U
2-2	Biochemistry BIOL2080U	Genetics and Molecular Biology BIOL2020U	Human Anatomy BIOL2050U	Organic Chemistry CHEM2120U	Elective*
3-1	Analytical Chemistry CHEM2030U	Principles of Pharmacology and Toxicology BIOL3020U	Population Genetics FSCI3110U	Criminalistics I FSCI3010U	Elective*
3-2	Forensic Biology FSCI3020U	Criminalistics II FSCI3030U	Forensic Chemistry FSCI3040U	Elective*	Elective*
4-1	Thesis Project in Forensic Science** FSCI4410U OR Senior Science Elective	Interdisciplinary Topics in Forensic Science FSCI4020U	Forensic Drug Chemistry and Toxicology FSCI4030U	Advanced Forensic Biology FSCI4120U	Elective*
4-2	Thesis Project in Forensic Science** FSCI4420U OR Senior Science Elective	Law for Forensic Scientists FSCI4050U	Elective	Elective*	Elective*

Electives and breadth requirements

Students must complete 24 elective credit hours. Students not accepted to take FSCI 4410U and FSCI 4420U must take an additional two senior science electives for a total of 30 elective credit hours. At least 12 elective credit hours must be in science courses offered by the Faculty of Science, where 6 of these credit hours must be in biology – refer to Recommended Biology Electives. The additional two senior science electives, if taken in place of FSCI 4410U and FSCI 4420U, cannot be used to meet this requirement or to satisfy minor requirements. In order to satisfy breadth requirements 9 credit hours must be in courses outside the Faculty of Science. Students must take an additional 3 credit hours in a general elective (offered by the Faculty of Science or outside the Faculty of Science).

Changes:

1st year: none

2nd year:

- Removed Introductory Psychology PSYC1000U from 2-2

3rd year:

- Removed Physical Chemistry for Biosciences CHEM3140U from 3-1
- Added Population Genetics FSCI 3110U to 3-1
- Removed Instrumental Analytical Chemistry CHEM3830U from 3-2

4th year:

- Removed Forensic Psychology FSCI4410U from 4-2
- Added Advanced Forensic Biology FSCI 4220U to 4-1

Recommended biology electives:

- BIOL 2060 (Introduction to Microbiology and Immunology)
- BIOL 3010 (Lab Methods in Molecular Biology)
- BIOL 3031 (Infection and Immunity)
- BIOL 3032 (Advanced Microbiology)
- BIOL 3040 (Physiology of Regulatory Systems)
- BIOL 3050 (Developmental Biology)
- BIOL 3060 (Fundamentals of Neuroscience)
- BIOL 3080 (Biochemistry II)
- BIOL 3610 (Comparative Zoology)
- BIOL 3620 (Conservation Biology)
- BIOL 3630 (Soil-Plant Relationships)
- BIOL 3640 (Plant Biology)
- BIOL 3650 (Fundamentals of Nutrition)
- BIOL 3660 (Ecology)
- BIOL 4030 (Advanced Topics in Environmental Toxicology)
- BIOL 4040 (Applied Molecular Biology)
- BIOL 4050 (Advanced Topics in Pharmaceutical Biotechnology)
- BIOL 4070 (Advanced Biochemistry)
- STAT 3010 (Biostatistics)

Bachelor of Science (Honours) in Forensic Science Program Map - Chemistry

Year-Sem.	Subject	Subject	Subject	Subject	Subject
1-1	Chemistry I CHEM1010U	Biology I BIOL1010U	Physics I PHY1010U OR Introductory Physics PHY1030U	Introductory Calculus MATH 1000U OR Calculus I MATH1010U	Introduction to Computer Science with Python CSCI1040U
1-2	Chemistry II CHEM1020U	Biology II BIOL1020U	Physics for Biosciences PHY1040U	Calculus II MATH1020U	Introductory Forensic Science FSCI1010U
2-1	Introductory Physiology BIOL2010U	Cell Biology BIOL2030U	Introduction to Organic Chemistry CHEM2020U	Statistics and Probability for Biological Science STAT2020U	Crime Scene Science FSCI2010U
2-2	Biochemistry BIOL2080U	Genetics and Molecular Biology BIOL2020U	Human Anatomy BIOL2050U	Organic Chemistry CHEM2120U	Elective*
3-1	Analytical Chemistry CHEM2030U	Principles of Pharmacology and Toxicology BIOL3020U	Physical Chemistry for Biosciences CHEM3140U	Criminalistics I FSCI3010U	Elective*
3-2	Instrumental Analytical Chemistry CHEM3830U	Criminalistics II FSCI3030U	Forensic Chemistry FSCI3040U	Forensic Biology FSCI 3020U	Elective*
4-1	Thesis Project in Forensic Science** FSCI4410U OR Senior Science Elective	Interdisciplinary Topics in Forensic Science FSCI4020U	Forensic Drug Chemistry and Toxicology FSCI4030U	Elective*	Elective*
4-2	Thesis Project in Forensic Science** FSCI4420U OR Senior Science Elective	Law for Forensic Scientists FSCI4050U	Fire Investigation FSCI4040U	Elective*	Elective*

Electives and breadth requirements

Students must complete 21 elective credit hours. Students not accepted to take FSCI 4410U and FSCI 4420U must take an additional two senior science electives for a total of 27 elective credit hours. At least 9 elective credit hours must be in science courses offered by the Faculty of Science, where 3 of these credit hours must be in chemistry – refer to Recommended Chemistry Electives. The additional two senior science electives, if taken in place of FSCI 4410U and FSCI 4420U, cannot be used to meet this requirement or to satisfy minor requirements. In order to satisfy breadth requirements 9 credit hours must be in courses outside the Faculty of Science. Students must take an additional 3 credit hours in a general elective (offered by the Faculty of Science or outside the Faculty of Science).

Changes:

1st year: none

2nd year:

- Removed Introductory Psychology PSYC 1000U from 2-2

3rd year: none

4th year:

- Removed Forensic Psychology FSCI 4410U from 4-2
- Added Fire Investigation FSCI 4040U to 4-2

Recommended chemistry electives:

- CHEM 2010U (Structure and Bonding)
- CHEM 3120U (Advanced Organic Chemistry)
- CHEM 3220U (Molecular Structure Determination of Spectroscopic Data)
- CHEM 3120U (Advanced Organic Chemistry)
- CHEM 3510U (Inorganic Chemistry: Transition Metals)
- CHEM 4010U (Industrial Chemistry)
- CHEM 4050U (Environmental Chemistry)
- CHEM 4080U (Hydrogen-Based Energy Systems and Fuel Cells)
- CHEM 4110U (Bio-Organic Chemistry)
- CHEM 4120U (Advanced Topics in Biological Chemistry)
- CHEM 4510U (Pharmaceutical Discovery)
- CHEM 4520U (Advanced Topics in Pharmaceutical Chemistry)
- STAT 3010 (Biostatistics)

Bachelor of Science (Honours) in Forensic Science Program Map - Physics

Year-Sem.	Subject	Subject	Subject	Subject	Subject
1-1	Chemistry I CHEM1010U	Biology I BIOL1010U	Physics I PHY1010U OR Introductory Physics PHY1030U	Introductory Calculus MATH 1000U OR Calculus I MATH1010U	Introduction to Computer Science with Python CSCI1040U
1-2	Chemistry II CHEM1020U	Biology II BIOL1020U	Physics II PHY1020U	Calculus II MATH1020U	Introductory Forensic Science FSCI1010U
2-1	Introductory Physiology BIOL2010U	Cell Biology BIOL2030U	Introduction to Organic Chemistry CHEM2020U	Statistics and Probability for Biological Science STAT2020U	Crime Scene Science FSCI2010U
2-2	Biochemistry BIOL2080U	Genetics and Molecular Biology BIOL2020U	Human Anatomy BIOL2050U	Elective*	Organic Chemistry CHEM2120U
3-1	Analytical Chemistry CHEM2030U	Principles of Pharmacology and Toxicology BIOL3020U	Mechanics I PHY2030U	Criminalistics I FSCI3010U	Elective*
3-2	Electricity and Magnetism PHY2010U	Criminalistics II FSCI3030U	Forensic Chemistry FSCI3040U	Forensic Biology FSCI3020U	Elective*
4-1	Thesis Project in Forensic Science** FSCI4410U OR Senior Science Elective	Interdisciplinary Topics in Forensic Science FSCI4020U	Forensic Drug Chemistry and Toxicology FSCI4030U	Elective*	Elective*
4-2	Thesis Project in Forensic Science** FSCI4420U OR Senior Science Elective	Law for Forensic Scientists FSCI4050U	Forensic Physics Applications PHY4120U	Elective*	Elective*

Electives and breadth requirements

Students must complete 21 elective credit hours. Students not accepted to take FSCI 4410U and FSCI 4420U must take an additional two senior science electives for a total of 27 elective credit hours. At least 9 elective credit hours must be in science courses offered by the Faculty of Science, where 6 of these credit hours must be in physics – refer to Recommended Physics Electives. The additional two senior science electives, if taken in place of FSCI 4410U and FSCI 4420U, cannot be used to meet this requirement or to satisfy minor requirements. In order to satisfy breadth requirements 9 credit hours must be in courses outside the Faculty of Science. Students must take an additional 3 credit hours in a general elective (offered by the Faculty of Science or outside the Faculty of Science).

Changes:

1st year:

- Replace PHY1040U with PHY1020U in 1-2

2nd year:

- Removed Introductory Psychology PSYC 1000U from 2-2

3rd year:

- Added Mechanics I PHY 2030U to 3-1
- Added Electricity and Magnetism PHY 2010U to 3-2
- Removed Physical Chemistry for Biosciences CHEM 3140U
- Removed Instrumental Analytical Chemistry CHEM 3830U

4th year:

- Removed Forensic Psychology FSCI 4410U from 4-2
- Added Forensic Physics Applications PHY 4120U to 4-2

Recommended physics electives:

- PHY 2020U (Electricity and Magnetism II)
- PHY 2040U (Mechanics II)
- PHY 2050U (Thermodynamics and Heat Transfer)
- PHY 2060U (Nuclear Physics and Relativity)
- PHY 2900U (The Science of Astronomy)
- PHY 3010U (Statistical Mechanics I)
- PHY 3030U (Electronics)
- PHY 3060U (Fluid Mechanics)
- PHY 3050U (Waves and Optics)
- PHY 4010U (Statistical Mechanics II)
- PHY 4030U (Modern Physics)
- PHY 4100U (Medical Imaging)
- FSCI 4040U (Fire Investigation)
- MATH 2050U (Linear Algebra)

Bachelor of Science (Honours) in Forensic Science Program Map – Psychology

Year-Sem.	Subject	Subject	Subject	Subject	Subject
1-1	Chemistry I CHEM1010U	Biology I BIOL1010U	Physics I PHY1010U OR Introductory Physics PHY1030U	Introductory Calculus MATH 1000U OR Calculus I MATH1010U	Introduction to Computer Science with Python CSCI1040U
1-2	Chemistry II CHEM1020U	Biology II BIOL1020U	Physics for Biosciences PHY1040U	Calculus II MATH1020U	Introductory Forensic Science FSCI1010U
2-1	Introductory Physiology BIOL2010U	Cell Biology BIOL2030U	Introduction to Organic Chemistry CHEM2020U	Statistics and Probability for Biological Science STAT2020U	Crime Scene Science FSCI2010U
2-2	Biochemistry BIOL2080U	Genetics and Molecular Biology BIOL2020U	Human Anatomy BIOL2050U	Introductory Psychology PSYC1000U	Organic Chemistry CHEM2120U
3-1	Analytical Chemistry CHEM2030U	Principles of Pharmacology and Toxicology BIOL3020U	Elective*	Criminalistics I FSCI3010U	Elective*
3-2	Forensic Biology FSCI3020U	Criminalistics II FSCI3030U	Forensic Chemistry FSCI3040U	Forensic Psychology FSCI3210	Elective*
4-1	Thesis Project in Forensic Science** FSCI4410U OR Senior Elective approved by Faculty	Interdisciplinary Topics in Forensic Science FSCI4020U	Forensic Drug Chemistry and Toxicology FSCI4030U	Elective*	Elective*
4-2	Thesis Project in Forensic Science** FSCI4420U OR Senior Elective approved by Faculty	Law for Forensic Scientists FSCI4050U	Elective*	Elective*	Elective*

Electives and breadth requirements

Students must complete 24 elective credit hours. Students not accepted to take FSCI 4410U and FSCI 4420U must take an additional two senior science electives for a total of 30 elective credit hours. At least 12 elective credit hours must be in psychology courses offered by the Faculty of Social Science and Humanities, where 3 of these elective credit hours must be in a senior level psychology course – refer to Recommended Psychology Electives. In order to satisfy breadth requirements 9 credit hours must be in science courses offered by the Faculty of Science. The additional two senior science electives, if taken in place of FSCI 4410U and FSCI 4420U, cannot be used to meet this requirement or to satisfy minor

requirements. Students must take an additional 3 credit hours in a general elective (offered by the Faculty of Science or outside the Faculty of Science).

Changes:

1st year:

- Removed: Physics for Biosciences PHY1040U from 1-2

2nd year:

- Moved Introductory Psychology PSYC1000U from 2-2 to 1-2

3rd year:

- Removed Physical Chemistry for Biosciences CHEM3140U from 3-1
- Removed Instrumental Analytical Chemistry CHEM3830U from 3-2
- Forensic Psychology moved from 4-2 to 3-2

4th year: none

Recommended psychology Electives:

Students are recommended to take SSCI 2900U Research Methods in order to satisfy the prerequisite requirements for many of the senior psychology courses.

- SSCI 2900U (Research Methods)
- PSYC 2010U (Developmental Psychology)
- PSYC 2020U (Social Psychology)
- PSYC 2030U (Abnormal Psychology)
- PSYC 2040U (Personality Psychology)
- PSYC 2050U (Brain and Behaviour)
- PSYC 2060U (Cognitive Psychology)
- PSYC 2830U (Justice Theory and Policy)
- PSYC 3050U (Clinical Forensic Psychology)
- PSYC 3055U (Treatment in Forensic Settings)
- PSYC 3310U (Confessions and Interrogations)
- PSYC 3320U (Eyewitness Psychology)
- PSYC 3500U (Stereotypes and Prejudice)
- PSYC 3820U (Psychology of Deviance)
- Others possible if we waive prerequisites

3. Resources Requirements

a. Faculty members

The Forensic Science Program currently comprises of one faculty member and one senior lecturer/Senior Laboratory Instructor. An additional Faculty member has been granted and the Hiring Committee has already formulated a shortlist of potential interviewees. The new faculty member will be expected to teach three courses their first year and four courses the following year.

b. Additional academic and non-academic human resources

Currently four of the forensic science courses are taught by sessional lecturers. However, with the addition of four new forensic science courses and only one Faculty member, it is expected that the number of courses taught by sessional lecturers will increase.

Due to the smaller number of students expected in the Physics and Psychology specializations, not all courses will have to be offered each year. For example, PHYS 4120 Forensic Physics Applications and numerous Psychology (PSYC) courses will only be offered every other year.

Two (FSCI 4120 Advanced Forensic Biology and FSCI 4040 Fire Investigations) of the four proposed new courses require half labs; that is, four hour labs bi-weekly. With these additions, two half-time positions will be required for Teaching Assistants.

Academic Advising within the Faculty of Science will likely see an increased number of Forensic Science students due to the additional electives and choice of courses required for each specialization.

c. Physical resource requirements

The physical resources required for the new specializations as well as the new proposed courses already exist within the Faculty of Science. The Forensic Science Lab (UB 4047) can support the labs for new courses FSCI 4120 Advanced Forensic Biology and FSCI 4040 Fire Investigations. However, FSCI 4040 Fire investigation will require two to four laboratory sessions in a Chemistry laboratory in order to give the students access to the GC-MS. These additional laboratories have already been approved by Chemistry.

FSCI 3210U (formerly FSCI 4010) Forensic Psychology has been removed and is now cross-listed with PSYC 3210U Forensic Psychology. This change will open some classroom space.

Appendix 1

Faculty: Science		
Course title: Essentials of Crime Scene Science		
Course number: FSCI 2020U	Cross-listings:	<input checked="" type="checkbox"/> Core <input type="checkbox"/> Elective
Credit weight: 3cr	Contact hours: <input type="checkbox"/> 3_ Lecture <input type="checkbox"/> Lab <input type="checkbox"/> 1.5_ Tutorial <input type="checkbox"/> Other	

CALENDAR DESCRIPTION

This course is a survey study of the processes that occur at a crime scene, directed toward non-forensic science students. Students will be taught crime scene procedures, from record keeping at the scene through to the preservation and collection of evidence. This will include techniques for the recovery of fingerprints, footwear impressions, tool marks and the collection and correct packaging of items such as hairs, fibres, glass and biological fluids. This course emphasizes self-directed learning and is offered in hybrid format, involving both in-class and online lectures. Tutorials will be offered online. 3 cr, 1.5 lec, 1.5 online lectures and self-learning material, 1.5 tut. Prerequisites: FSCI 1010U Restrictions: Students enrolled in the Forensic Science, Physics specialization in Forensic Physics, or Computing Science specialization in Digital Forensics programs.

Prerequisites	FSCI 1010
Co-requisites	
Credit restrictions	Students enrolled in the Forensic Science, Physics specialization in Forensic Physics, or Computing Science specialization in Digital Forensics programs.
Credit exemptions	
Grading scheme	<input checked="" type="checkbox"/> letter grade <input type="checkbox"/> pass/fail

LEARNING OUTCOMES

1. Understand the legal aspects of evidence collection and storage, and of the presentation of evidence in a legal framework;
2. Identify different classes of crime scenes;
3. Select the appropriate techniques for routine collection and analysis of evidence;
4. Learn about the theory and application of forensic photography;
5. Apply routine techniques of search and recovery; isolate and identify trace evidence;
6. Prepare and write a formal crime-scene report

DELIVERY MODE

(check all that may apply) face-to-face hybrid online

TEACHING AND ASSESSMENT METHODS

1. Online learning modules will be used in hybrid portion of curriculum (e.g. Crime Scene Walk-Thru and Forensic Photography)
2. Assignments & quizzes 30%, crime-scene report 20%, mid-term 20%, and final exam 30%

CONSULTATION AND FINANCIAL IMPLICATIONS, WHERE APPROPRIATE

1. Consulted with Dr. Kimberley Clow (Associate Professor, Faculty of Social Science & Humanities and member of the UOIT Forensic Science Advisory Committee)
2. No cost associated with online learning module development since they have already been created

Faculty Council Item:

Create a new course intended for non-Forensic Science students, available to other science students or students in other Faculties who have an interest in crime scene investigation.

Rationale: Our first year forensic science course (FSCI 1010) is very popular among students from all faculties. Students wishing to expand upon their knowledge of crime scene investigation are unable to since they are restricted from enrolling in any of our forensic-specific courses. Specifically, the Faculty of Social Science and Humanities approached us about offering a parallel course to FSCI 2010, for non-forensic science students.

We propose this new course, which is similar in content to FSCI 2010, but will be delivered in hybrid format and without laboratories.

Implementation:

The course material (lectures, assignments, online learning modules) have already been developed. The latter will need to be made available for hybrid learning. Tutorials will be delivered online – for self-directed learning.

Impact on undergraduate students:

Introduction of this new course will have a positive impact on student learning since it will allow more students the option to learn about the theory and practicalities of crime scene investigation.

Impact on graduate students:

This course would create one new TAsip position.

Faculty: Science		
Course title: Population Genetics		
Course number: FSCI 3110U	Cross-listings:	<input checked="" type="checkbox"/> Core <input type="checkbox"/> Elective
Credit weight: 3cr	Contact hours: <input checked="" type="checkbox"/> 3 Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Other	

CALENDAR DESCRIPTION

This course explores how evolutionary forces drive allele frequency change. Topics include drift, coalescence, random mating, inbreeding, genetic drift, mutation load and natural selection as they relate to populations. The role and significance of molecular genetics as it relates to population genetics, evolution, systematics and phylogeny is also considered. Concepts will be examined in the context of forensic science as well as other applied biological sciences. 3cr. Prerequisites: MATH 1000U or MATH 1010U, BIOL 1010U, BIOL 1020U, STAT 2020U, and BIOL 2020U.

Prerequisites	MATH 1000U or MATH 1010U, BIOL 1020U, STAT 2020U, and BIOL 2020U
Co-requisites	
Credit restrictions	
Credit exemptions	
Grading scheme	<input checked="" type="checkbox"/> letter grade <input type="checkbox"/> pass/fail

LEARNING OUTCOMES

- 1) An in-depth understanding of allele frequencies within the human population
- 2) An understanding of the effects of evolutionary process, such as mutations, gene flow, and natural selection.
- 3) Statistical interpretation of data so that the student can interpret likelihood ratios and other methods of analysis.

DELIVERY MODE

(check all that may apply) face-to-face hybrid online
 3hrs of lecture per week

TEACHING AND ASSESSMENT METHODS

Assignments & quizzes 40%, mid-term 20%, and final exam 40%

CONSULTATION AND FINANCIAL IMPLICATIONS, WHERE APPROPRIATE

1. Consulted with Dr. Andrea Kirkwood (Assistant Professor, Faculty of Science)

Faculty Council Item:

Create a new course intended for Forensic Science students, but also open to other science students.

Rationale: We are proposing four new specializations in the Forensic Science Program which include Biology, Chemistry, Physics and Psychology. FSCI 3110 will be a required course for completion of the Forensic Science Biology specialization. The addition of a population genetic course to our program map was strongly suggested by the Forensic Science Advisory Committee on several occasions.

Implementation: The course material (lectures, assignments) would need to be developed.

Impact on undergraduate students:

1. Forensic Science students in the biology specialization will be required to successfully complete this course in order to take FSCI 3120U Forensic Biology (currently FSCI 3020U).
2. As population genetics is not a course currently offered in the Faculty of Science, the course will be open to other students providing they have completed the appropriate pre-requisites.
3. Members of the Forensic Science Advisory Committee have commented that a Population Genetics course would strengthen the knowledge of our undergraduates and set them apart from graduates of other Forensic Science programs.

Impact on graduate students:

This course would create one new TAsip position.

Faculty: Science		
Course title: Advanced Forensic Biology		
Course number: FSCI 4120U	Cross-listings:	<input checked="" type="checkbox"/> Core <input type="checkbox"/> Elective
Credit weight: 3cr	Contact hours: <input type="checkbox"/> 3 Lecture <input type="checkbox"/> 4 hrs bi-weekly Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Other	

CALENDAR DESCRIPTION

Advanced forensic biology expands on the theories and techniques learned in Forensic Biology FSCI 3120U. Topics including SNPs, microbial DNA, Y-STRs, mitochondrial DNA are discussed. Emphasis will be placed on state-of-the-art technologies and their application to common forensic biological issues such as degradation, sensitivity, specificity, and variation in sample type. The course will also focus on population statistics used in forensic DNA analysis with an emphasis on statistical interpretation of mixtures. Students will also learn the importance and practice of trial preparation and expert witness testimony. Curriculum will be taught through a combination of lectures, case studies, videos and practical laboratories. 3 cr, 4 lab (biweekly). Prerequisites: FSCI 3120U and enrolment in year four of the Forensic Science program.

Prerequisites	FSCI 3120U and enrolment in year four of the Forensic Science program.
Co-requisites	
Credit restrictions	
Credit exemptions	
Grading scheme	<input checked="" type="checkbox"/> letter grade <input type="checkbox"/> pass/fail

LEARNING OUTCOMES

1. Ability to statistically evaluate forensic biological evidence results
2. Understand current issues surrounding DNA analysis and statistical interpretations
3. Apply scientific principles to interpret and examine biological evidence
4. Prepare evidence for the courtroom and present expert witness testimony

DELIVERY MODE

(check all that may apply) face-to-face hybrid online

TEACHING AND ASSESSMENT METHODS

Laboratories 30%, Assignments & quizzes 20%, mid-term 20%, and final exam 30%

CONSULTATION AND FINANCIAL IMPLICATIONS, WHERE APPROPRIATE

1. Cost of a new lab section (4hrs bi-weekly) (facilities are already available, UB4075)

Faculty: Science		
Course title: Fire Investigation		
Course number: FSCI 4040U	Cross-listings:	<input checked="" type="checkbox"/> Core <input type="checkbox"/> Elective
Credit weight: 3cr	Contact hours: <input type="checkbox"/> 3_ Lecture <input checked="" type="checkbox"/> 4 bi-weekly_ Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Other	

CALENDAR DESCRIPTION

This course explores the dynamics and theory of fire behavior during fire, arson and explosion investigations. Topics include origin and cause determination, evidence sampling, accelerant detection and analysis, major case management, as well as scene documentation and diagramming. Emphasis will be placed on the various collection methods such as solvent extraction, headspace extraction and adsorption extraction used to analyse fire accelerants and ignitable liquid residues. Chromatographic techniques used for the detection of accelerants will be studied in detail. Students will also learn the importance and practice of trial preparation and expert witness testimony. Curriculum will be taught through a combination of lectures, case studies, videos and practical laboratories. 3 cr, 4 lab (biweekly). Prerequisites: FSCI 3040U and enrolment in year four of the Forensic Science program.

Prerequisites	FSCI 3040U and enrolment in year four of the Forensic Science program.
Co-requisites	
Credit restrictions	Chemistry students
Credit exemptions	
Grading scheme	<input checked="" type="checkbox"/> letter grade <input type="checkbox"/> pass/fail

LEARNING OUTCOMES

1. Understand fire dynamics and behavior as it relates to specific major case scenarios
2. Apply scientific principles to interpret and examine a fire scene
3. Analyse materials recovered from the scene for the presence of accelerants
4. Prepare evidence for the courtroom and present expert witness testimony

DELIVERY MODE

(check all that may apply) **face-to-face** **hybrid** **online**

TEACHING AND ASSESSMENT METHODS

Laboratories 30%, Assignments & quizzes 20%, mid-term 20%, and final exam 30%

CONSULTATION AND FINANCIAL IMPLICATIONS, WHERE APPROPRIATE

1. Consulted with Mr. Greg Olson, MSc – Fire Investigator at the Office of the Fire Marshal and member of the UOIT Forensic Science Advisory Committee (and retired Staff Sergeant at York Regional Police)
2. Consulted with Dr. Fedor Naumkin (Faculty of Science, Undergraduate Program Director Chemistry)
3. Cost of a new lab section (4hrs bi-weekly)

Faculty: Science		
Course title: Mock Crime Scene Practicum		
Course number: FSCI 4460U	Cross-listings:	<input checked="" type="checkbox"/> Core <input type="checkbox"/> Elective
Credit weight: 3cr	Contact hours: __Lecture __ Lab ____ Tutorial __4_ Other	

CALENDAR DESCRIPTION

Students will investigate a simulated major crime scene synthesizing the knowledge they have gained throughout the forensic science program. This course emphasizes good judgment, critical thinking and deductive reasoning skills. Students will participate in all aspects of a forensic science investigation, from crime scene to lab, culminating with expert witness testimony in a mock court setting. A mock crime scene scenario will provide an opportunity for students to gain further experience on a variety of equipment and instrumentation. This course will enhance student skillsets and prepare students to enter the workforce. Students will present their work in the form of a lab report and poster presentation. 3 cr, 4 oth. Prerequisites: Students will have completed all 90 credit hours required by the end of year three in the Forensic Science program map, be in clear standing, be enrolled in year four of the Forensic Science program, and will obtain prior consent of a faculty member. A supplemental course fee will apply.

Prerequisites	90 credit hours required by the end of year three in the Forensic Science program map, clear standing, enrolled in year four of the Forensic Science program, prior consent of a faculty member
Co-requisites	
Credit restrictions	Students enrolled in the Honours Thesis Capstone course I/II
Credit exemptions	
Grading scheme	<input checked="" type="checkbox"/> letter grade <input type="checkbox"/> pass/fail

LEARNING OUTCOMES

1. Application of the scientific method to crime scene investigation
2. Ability to communicate findings in the form of a lab report, expert witness testimony and a poster presentation
3. Theoretical and practical knowledge of forensic science equipment/instrumentation and their application to evidence analysis
4. Ability to work independently and think objectively

DELIVERY MODE

(check all that may apply) face-to-face hybrid online

TEACHING AND ASSESSMENT METHODS

Crime scene/laboratory processing of evidence (incl. documentation and examination forms) 30%
Lab report 30%
Expert witness testimony 25%
Poster presentation 15%

CONSULTATION AND FINANCIAL IMPLICATIONS, WHERE APPROPRIATE

Cost of a new lab section (4hr weekly) – although using existing facilities (Crime Scene House and UB4075)