

SCIENCES - Table of Contents

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SUMMARY OF COURSE CHANGES

Department Name	No. of full courses deleted	No. of full courses added	No. of half courses deleted	No. of half courses added	No. of full courses changed	No. of half courses changed	Net FCEs
Astronomy	0	0	0	0	0	1	
Biology	0	1	0	2	0	2	
Chemistry	0	0	0	0	0	1	
Computer Science	0	0	2	3	0	7	
Earth Science	0	0	0	1	0	1	
Economics	0	0	0	0	1	0	
Environment	0	0	0	0	0	0	
Forensic Science	0	0	1	0	1	1	
Geography	1	1	0	1	2	8	
Mathematics	0	0	0	0	1	7	
Physics	0	0	0	3	0	2	
Psychology	0	0	0	2	0	1	
Science	0	0	0	0	0	0	
Sociology	1	0	0	2	1	0	
Statistics	0	0	1	2	0	6	

New Programs

Program #1 ERSPE1944 Biological Physics Specialist (Science) - Specialist

Within an Honours Degree, 13.0 credits are required.

Limited enrolment Enrolment in the program is restricted to students with 70% in PHY135Y and CHM140Y.

Year 1: PHY135Y5; CHM140Y5; (MAT135Y5/137Y5)

Year 2: PHY241H5; PHY242H5, 245H5, 247H5; MAT223H5, 242H5; CHM221H5; BIO206H5

Year 3: PHY331H5, 332H5; JCP321H5, 322H5; MAT311H5; (MAT332H5/STA257H5); CHM371H5

Year 4: PHY424H5; PHY441H5; PHY489Y5; JCP310H5/422H5

Rationale for creation: The department has decided to focus its activities in physics on the area of biological physics. This distinguishes us from the St George physics programs and allows for a collaboration with colleagues in chemistry and ultimately biology. The proposed new specialist program in biological physics is a high quality and challenging program that makes use of the department's expertise in biological physics and chemistry to provide students with an understanding of the core areas of physics and chemistry as well as their application to the study of biological systems.

Programs - Resource Implications

Program #1 ERSPE2511 Mathematical Sciences (Science)

Resource implications: The introduction of the new course MAT202 will be funded through the Dean's writing initiative.

Deleted Programs

NONE

Programs - Other Changes

Program #1 ERMAJ0205 Forensic Science

Rationale for change: In order to set a more uniform standard set of entrance course requirements amongst the Forensic Science Programs (added to CHM require. "with 65% or better" and completion of MAT134Y5/135Y5/137Y5. Also replaced (STA220H5, 221H5) with new Forensics Stats courses (STA310H5,311H5). Added CSC233H5 to option courses.

Before: Limited Enrolment: Admission into the Forensic Science Major Program is by Special Application ONLY and **MUST** be completed in conjunction with a second approved Major (see Notes below). To be considered for admission into the program, ALL students, including students admitted into the 1st year Forensic Science category, **MUST** submit a direct on-line FSC Application, upon completing the 1st year minimum requirements . **Meeting the minimum requirements does not guarantee admission into the program.**

Minimum Requirements:

1. Completion of 4.0 credits; including 3.0 science credits.
2. Completion of CHM140Y5.
3. A minimum Cumulative Grade Point Average of at least **2.7** The actual CGPA requirement in any particular year may exceed this value, in order to achieve a proper balance between enrolments and teaching resources.
4. Enrolment in an Approved Second Major (See Note 1).

Application for admission into the program for ALL students can be found at: www.utm.utoronto.ca/~w3fsc Forensic Science Applications Open: **Mid-February of each year** Forensic Science Application Deadline: **April 1st of each year** **NOTE:** RE - Transfer Students who have attended another post-secondary institution, or another Faculty within the University of Toronto (including St. George and UTSC), who wish to gain admission into the program **MUST** also apply through the Ontario Universities Application Centre: www.ouac.on.ca (OUAC 105 application form), in addition to applying directly to the Forensic Science Program.

First Year	CHM140Y5, MAT132Y5/134Y5/135Y5/137Y5/138Y5; FSC239Y5
Third Year	BIO338H5; (BIO360H5, 361H5)/(STA220H5, 221H5)
Fourth Year	2.0 from the following list: FSC300H5, 302H5, 306H5, 310H5, 350H5, 401H5, 402H5

After: Limited Enrolment: Admission into the Forensic Science Major Program is by Special Application ONLY and **MUST** be completed in conjunction with a second approved Major (see Notes below). To be considered for admission into the program, ALL students, including students admitted into the 1st year Forensic Science category, **MUST** submit a direct on-line FSC Application, upon completing the 1st year minimum requirements . **Meeting the minimum requirements does not guarantee admission into the program.**

Minimum Requirements:

1. Completion of 4.0 credits; including 3.0 science credits.
2. Completion of CHM140Y5 with 65% or better.
3. Completion of MAT134Y5/135Y5/137Y.
4. A minimum Cumulative Grade Point Average of at least **2.7** The actual CGPA requirement in any particular year may exceed this value, in order to achieve a proper balance between enrolments and teaching resources.
5. Enrolment in an Approved Second Major (See Note 1).

Application for admission into the program for ALL students can be found at: www.utm.utoronto.ca/~w3fsc Forensic Science Applications Open: **Mid-February of each year** Forensic Science Application Deadline: **April 1st of each year** **NOTE:** RE - Transfer Students who have attended another post-secondary institution, or another Faculty within the University of Toronto (including St. George and UTSC), who wish to gain admission into the program **MUST** also apply through the Ontario Universities Application Centre: www.ouac.on.ca (OUAC 105 application form), in addition to applying directly to the Forensic Science Program.

First Year	CHM140Y5, FSC239Y5; MAT134Y5/135Y5/137Y5
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Third Year	BIO338H5; STA310H5, 311H5
Fourth Year	2.0 from the following list: BIO361H5; CSC333H5; FSC300H5, 302H5, 306H5, 310H5, 350H5, 401H5, 402H5

Program #2 ERMAJ1160 Psychology (Science)

Rationale for change: No changes to admission requirements were made. We removed "OAC" from admission requirements to all our programs as "OAC" courses have not been offered by the high schools now for several years.

Before: Limited Enrolment: Enrolment in this program is limited to students who have:

1. completed any OAC Mathematics/Gr.12(4U) Mathematics (students without one of these, consult PSY Department);
2. completed 4.0 credits;
3. a grade of at least 63% in PSY100Y5; and
4. a minimum CGPA of 2.0.

Students not initially meeting these requirements may be admissible after meeting the second-year requirements. Further information is available on the Psychology Department web site: www.utm.utoronto.ca/psychology

Higher Years	<ol style="list-style-type: none"> 1. PSY201H5/ECO220Y5/227Y5/ STA220H5/BIO360H5/SOC300Y5 2. 2.5 credits from the following courses: 0.5 credit must be taken from each group. <ol style="list-style-type: none"> 1. Biological Bases of Behaviour: PSY252H5, 290H5, 295H5 2. Cognitive/Perception: PSY270H5, 280H5 3. Social/Personality/Abnormal: PSY220H5, 230H5, 240H5 4. Developmental: PSY210H5, 213H5 3. 1.5 credits from the following courses: 0.5 credit must be taken from each group: <ol style="list-style-type: none"> 1. Biological Bases of Behaviour: PSY318H5, 346H5, 351H5, 353H5, 354H5, 355H5, 357H5, 362H5, 372H5, 393H5, 395H5, 397H5, 398H5; BIO304H5, 310H5, 318Y5, 328H5 2. Cognitive/Perception: CCT316H5, 326H5, 371H5, 373H5, 379H5; PSY312H5, 315H5, 316H5, 331H5, 351H5, 360H5, 362H5, 371H5, 372H5, 374H5, 385H5, 393H5, 397H5 3. Developmental/Abnormal/ Social/Personality: CCT316H5, 326H5; PSY310H5, 311H5, 312H5, 315H5, 316H5, 318H5, 320H5, 321H5, 325H5, 327H5, 328H5, 331H5, 343H5, 333H5, 340H5, 341H5, 344H5, 345H5, 346H5, 353H5 4. 1.0 additional credit in Psychology. At least 0.5 must be at the 300/400 level
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After: Limited Enrolment: Enrolment in this program is limited to students who have:

1. completed any Gr.12(4U) Mathematics or equivalent;
2. completed 4.0 credits;
3. a grade of at least 63% in PSY100Y5; and

4. a minimum CGPA of 2.0.

Students not initially meeting these requirements may be admissible after meeting the second-year requirements. Further information is available on the Psychology Department web site: www.utm.utoronto.ca/psychology

Higher Years	<ol style="list-style-type: none"> 1. PSY201H5/ECO220Y5/227Y5/ STA220H5/BIO360H5/SOC300Y5 2. 2.5 credits from the following courses: 0.5 credit must be taken from each group. <ol style="list-style-type: none"> 1. Biological Bases of Behaviour: PSY252H5, 290H5, 295H5 2. Cognitive/Perception: PSY270H5, 280H5 3. Social/Personality/Abnormal: PSY220H5, 230H5, 240H5 4. Developmental: PSY210H5, 213H5 3. 1.5 credits from the following courses: 0.5 credit must be taken from each group: <ol style="list-style-type: none"> 1. Biological Bases of Behaviour: PSY318H5, 346H5, 351H5, 353H5, 354H5, 355H5, 357H5, 362H5, 372H5, 393H5, 395H5, 397H5, 398H5; BIO304H5, 310H5, 318Y5, 328H5 2. Cognitive/Perception: CCT316H5, 326H5, 371H5, 373H5, 379H5; PSY312H5, 315H5, 316H5, 331H5, 351H5, 360H5, 362H5, 371H5, 372H5, 374H5, 385H5, 393H5, 397H5 3. Developmental/Abnormal/ Social/Personality: CCT316H5, 326H5; PSY310H5, 311H5, 312H5, 315H5, 316H5, 318H5, 320H5, 321H5, 322H5, 324H5, 325H5, 327H5, 328H5, 331H5, 333H5, 340H5, 341H5, 343H5, 344H5, 345H5, 346H5, 353H5 4. 1.0 additional credit in Psychology. At least 0.5 must be at the 300/400 level
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Program #3 ERMAJ1540 Statistics, Applied (Science)

Rationale for change: The program only requires 0.5 FCE in CSC. As CSC148H has CSC108H as a prerequisite, it suffices to only list CSC108H in the program requirements.

Before: 7.0 credits are required.

1. MAT(132Y/134Y, 135Y, 232H)/138Y, 222H/223H/248Y5 as special;
2. CSC108H/148H
3. STA(257H, 248H/258H)/ECO227Y, STA261H, 302H/331H, 332H
4. 3.0 additional credits (including at least 1.0 credit at the 300+ level) in STA, ACT or from CSC302H/331H, 350H, 354H, 411H; ECO327Y; GGR448H; MAT242/252H*, 311H, 334H*, 344H, 368H, 378H, 438H; BIO360H**, PSY201H**, SOC300Y**

After: 7.0 credits are required.

1. MAT(132Y/134Y/135Y/137Y, 232H)/138Y), 222H/223H/248Y5; MAT133Y is not acceptable
2. CSC108H
3. STA(257H, 248H/258H)/ECO227Y, STA261H, 302H/331H, 332H

4. 1.5 to 3.0 additional credits (including at least 1.0 credit at the 300+ level) in STA, ACT or from CSC302H/331H, 350H, 354H, 411H; ECO327Y; GGR448H; MAT242/252H*, 311H, 334H*, 344H, 368H, 378H, 438H; BIO360H**, PSY201H**, SOC300Y**

Program #4 ERMAJ1883 Exceptionality in Human Learning (Science)

Rationale for change: No changes to admission requirements were made. We removed "OAC" from admission requirements to all our programs as "OAC" courses have not been offered by the high schools now for several years.

Before: Limited Enrolment: Enrolment in this program is limited to students who have:

1. completed any OAC Mathematics/Gr.12(4U) Mathematics (students without one of these, consult PSY Department);
2. completed 4.0 credits;
3. a grade of at least 63% in PSY100Y5;
4. successfully completed 1.0 credit from BIO151Y5/(152H5, 153H5)/204H5/ 205H5/206H5/207H5; and
5. a minimum CGPA of 2.00.

Students not initially meeting these requirements may be admissible after meeting the second-year requirements. Further information is available on the Psychology Department web site: www.utm.utoronto.ca/psychology

Higher Years	<ol style="list-style-type: none"> 1. PSY201H5/ECO220Y5/227Y5/STA220H5/BIO360H5/SOC300Y5 2. PSY210H5, 213H5, 442Y5 3. 2.5 credits from the following: PSY310H5, 311H5, 312H5, 315H5, 316H5, 318H5, 319H5, 321H5, 325H5, 331H5, 333H5, 340H5, 341H5, 343H5, 344H5, 345H5, 346H5, 353H5, 374H5, 385H5, 393H5 4. 1.0 additional credit from 5. BIO204H5, 205H5, 206H5, 207H5, 210H5, 215H5, 304H5, 310H5, 315H5, 341H5, 370Y5, 372H5, 380H5, 407H5, 443H5, 452H5, 477H5; ANT203Y5, 331H5, 332Y5, 334H5, 339Y5, PSL201Y1
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After: Limited Enrolment: Enrolment in this program is limited to students who have:

1. completed any Gr.12(4U) Mathematics or equivalent;
2. completed 4.0 credits;
3. a grade of at least 63% in PSY100Y5;
4. successfully completed 1.0 credit from BIO151Y5/(152H5, 153H5)/204H5/205H5/206H5/207H5; and
5. a minimum CGPA of 2.00.

Students not initially meeting these requirements may be admissible after meeting the second-year requirements. Further information is available on the Psychology Department web site: www.utm.utoronto.ca/psychology

Higher Years	<ol style="list-style-type: none"> 1. PSY201H5/ ECO220Y5/227Y5/ STA220H5/ BIO360H5/ SOC300Y5 2. PSY210H5, 213H5, 3. 2.5 credits from the following: PSY310H5, 311H5, 312H5, 315H5, 316H5, 318H5, 319H5, 321H5, 325H5, 331H5, 333H5, 340H5, 341H5, 343H5, 344H5, 345H5, 346H5, 353H5, 374H5, 385H5, 393H5
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	4. 1.0 additional credit from: BIO204H5, 205H5, 206H5, 207H5, 210H5, 215H5, 304H5, 310H5, 315H5, 341H5, 370Y5, 372H5, 380H5, 407H5, 443H5, 452H5, 477H5, ANT203Y5, 331H5, 332Y5, 334H5, 339Y5, PSL201Y1
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Program #5 ERMAJ1944 Physics (Science)

Rationale for change: Major program revised to take into account new courses proposed as part of the introduction of the new Biological Physics Specialist program.

Before:	Year 1	PHY135Y5 (minimum 70%); CHM140Y5; MAT132Y5/134Y5/135Y5/137Y5/138Y5
	Year 2	PHY224H5/242H5, 241H5, 245H5 1.0 credits from: PHY237H5, 335H5, MAT212H5/242H5, MAT232H5

After:	Year 1	PHY135Y5 (minimum 60%); CHM140Y5; MAT132Y5/134Y5/135Y5/137Y5/138Y5
	Year 2	PHY224H5/242H5, 241H5, 245H5 1.0 credit from: PHY237H5, 247H5, 335H5, CHM221H5, MAT(212H5/242H5), 232H5

Program #6 ERMAJ2511 Mathematical Sciences (Science)

Rationale for change: The new course MAT202H5 will introduce students to the fundamental concept of abstraction. This fills a gap in our existing curriculum. It is added as a program requirement as part of a Dean's writing initiative. Among optional third and fourth year courses listed under 2, "four of" becomes "three of", to keep the total number of courses the same.

Before:	Second Year	MAT223H5, 224H5, 232H5, 242H5
	Higher Years	MAT301H5/315H5, 334H5, 392H5 Four of MAT301H5/315H5, MAT302H5, 309H5, 311H5, 332H5, 344H5, 368H5, 378H5, 402H5, 478H5, STA257H5/0.5 MAT credit at the 200+ level

After:	Second Year	MAT202H5, 223H5, 224H5, 232H5, 242H5
	Higher Years	1. MAT301H5/315H5, 334H5, 392H5 2. Three of MAT301H5/315H5, MAT302H5, 309H5, 311H5, 332H5, 344H5, 368H5, 378H5, 402H5, 478H5 3. STA257H5/0.5 MAT credit at the 200+ level

Program #7 ERMIN0840 Biomedical Communications (Science)

Rationale for change: Included limited enrolment criteria

Before: Limited Enrolment:
4.0 credits are required including: 3.0 credits from HSC300H5, 301H5, 302H5, 400H5, 401H5, 402H5, 403H5, 404H5, or P.I. 1.0 credits from BIO152H5, 153H5, or ANT101H5, 102H5

After: Limited Enrolment:
1. Enrolment in this program is limited to students who are also registered in a science major or specialist program.
2. A minimum CGPA of 2.20

4.0 credits are required including: 3.0 credits from HSC300H5, 301H5, 302H5, 400H5, 401H5, 402H5, 403H5, 404H5 1.0 credits from BIO152H5, 153H5, or ANT101H5, 102H5

Program #8 ERMIN1160 Psychology (Science)

Rationale for change: No changes to admission requirements were made. We removed "OAC" from admission requirements to all our programs as "OAC" courses have not been offered by the high schools now for several years.

Before: Limited Enrolment: Enrolment in this program is limited to students who have:

1. completed any OAC Mathematics/Gr.12(4U) Mathematics (students without one of these, consult PSY Department);
2. completed 4.0 credits;
3. a grade of at least 63% in PSY 100Y5; and
4. a minimum CGPA of 2.0

Students not initially meeting these requirements may be admissible after meeting the second-year requirements. Further information is available on the Psychology Department web site: www.utm.utoronto.ca/psychology

After: Limited Enrolment: Enrolment in this program is limited to students who have:

1. completed any Gr.12(4U) Mathematics or equivalent;
2. completed 4.0 credits;
3. a grade of at least 63% in PSY 100Y5; and
4. a minimum CGPA of 2.0

Students not initially meeting these requirements may be admissible after meeting the second-year requirements. Further information is available on the Psychology Department web site: www.utm.utoronto.ca/psychology

Program #9 ERSPE1009 Forensic Science - Chemistry (Science)

Rationale for change: Added the new Forensic Stats courses to list of course options.

Before:

First Year	CHM140Y5; MAT132Y5/135Y5/137Y5/138Y5; PHY135Y5/137Y5; FSC239Y5
Higher Years	<ol style="list-style-type: none"> 1. CHM211H5, 221H5, 231H5, 242H5, 243H5; FSC271H5/PHL271H5; BIO204H5/210H5 2. CHM311H5, 331H5/333H5, 341H5/345H5, 347H5, 361H5, 371H5/391H5, 393H5; (BIO360H5, 361H5)/(STA220H5, 221H5) 3. FSC300H5, 302H5, 401H5, 402H5 4. CHM414H5, 416H5 5. FSC481Y5 (with chemistry focus)/CHM489Y5

After:

First Year	CHM140Y5; FSC239Y5; MAT135Y5/137Y5; PHY135Y5
Higher Years	<ol style="list-style-type: none"> 1. BIO204H5/210H5; CHM211H5, 221H5, 231H5, 242H5, 243H5; FSC271H5/PHL271H5 2. CHM311H5, 331H5/333H5, 341H5/345H5, 347H5, 361H5, 371H5/391H5, 393H5; (BIO360H5, 361H5)/(STA220H5, 221H5)/(STA310H5, 311H5) 3. FSC300H5, 302H5, 401H5, 402H5 4. CHM414H5, 416H5 5. FSC481Y5 (with chemistry focus)/CHM489Y5

Program #10 ERSPE1037 Computer Science: Information Systems Option (Science)

Rationale for change: A line was added in the Description, to affirm that the program is discontinued. This was omitted from the previous Calendar.

Before:

After: *As of September 2005, this program is discontinued. Students already in this program may continue to follow it.*

Program #11 ERSPE1160 Psychology (Science)

Rationale for change: **Completion of 8.0 FCE for admission to program** The rationale is to base admission decisions to competitive and coveted programs on a broader basis of courses to guarantee that those admitted are indeed suitable. The current admission system has often admitted excellent first year students who could not maintain strong academic achievement in second year and beyond but were eligible to enroll in labs and seminars normally reserved and designed for stronger students.

Before: Limited Enrolment: Enrolment in this program is limited to students who have:

1. completed any OAC Mathematics/Gr.12(4U) Mathematics (students without one of these, consult PSY Department);
2. completed 4.0 credits;
3. a grade of at least 77% in PSY100Y5; and
4. a minimum CGPA of 3.0.

Students not initially meeting these requirements may be admissible after meeting the second-year requirements. Further information is available on the Psychology Department web site: www.utm.utoronto.ca/psychology

Second Year	<ol style="list-style-type: none"> 1. (PSY201H5, 202H5)/ ECO220Y5/ 227Y5/ (STA220H5, 221H5)/(BIO360H5, 361H5) 2. 2.5 credits from the following courses: 0.5 credit must be taken from each of the following groups and one additional 0.5 credit from groups a) or b) <ol style="list-style-type: none"> 1. Biological Bases of Behaviour: PSY252H5, 290H5, 295H5 2. Cognitive/Perception: PSY270H5, 280H5 3. Social/Personality/Abnormal: PSY220H5, 230H5, 240H5 4. Developmental: PSY210H5, 213H5
Third Year	<ol style="list-style-type: none"> 1. PSY309H5 2. One laboratory course from the following: PSY319H5, 329H5, 379H5, 399H5 3. 2.5 credits from the following courses: 0.5 credit must be taken from each group: <ol style="list-style-type: none"> 1. Biological Bases of Behaviour: PSY318H5, 346H5, 351H5, 353H5, 354H5, 355H5, 357H5, 362H5, 372H5, 393H5, 395H5, 397H5, 398H5; BIO304H5, 310H5, 318Y5, 328H5 2. Cognitive/Perception: CCT316H5, 326H5, 371H5, 373H5, 379H5; PSY312H5, 315H5, 316H5, 331H5, 351H5, 360H5, 362H5, 371H5, 372H5, 374H5, 385H5, 393H5, 397H5 3. Developmental/ Abnormal/ Social/ Personality: CCT316H5, 326H5; PSY310H5, 311H5, 312H5, 315H5, 316H5, 318H5, 320H5, 321H5, 325H5, 327H5, 328H5, 331H5, 343H5, 333H5, 340H5, 341H5, 344H5, 345H5, 346H5, 353H5

After:

Limited Enrolment: Enrolment in this program is limited to students who have:

1. completed any Gr.12(4U) Mathematics or equivalent;
2. completed 8.0 credits;
3. at least 77% as the average of PSY201H5, 202H5, and at least 1.5 FCE in 200 series PSY courses; and
4. a minimum CGPA of 3.0.

Second Year	<ol style="list-style-type: none">1. (PSY201H5, 202H5)/ECO220Y5/227Y5/(STA220H5, 221H5)/BIO360H5, 361H5)2. 2.5 credits from the following courses: 0.5 credit must be taken from each of the following groups and one additional 0.5 credit from groups a) or b)<ol style="list-style-type: none">1. Biological Bases of Behaviour: PSY252H5, 290H5, 295H52. Cognitive/Perception: PSY270H5, 280H53. Social/Personality/Abnormal: PSY220H5, 230H5, 240H54. Developmental: PSY210H5, 213H5
Third Year	<ol style="list-style-type: none">1. PSY309H52. One laboratory course from the following: PSY319H5, 329H5, 379H5, 399H53. 2.5 credits from the following courses: 0.5 credit must be taken from each group:<ol style="list-style-type: none">1. Biological Bases of Behaviour: PSY318H5, 346H5, 351H5, 353H5, 354H5, 355H5, 357H5, 362H5, 372H5, 393H5, 395H5, 397H5, 398H5; BIO304H5, 310H5, 318Y5, 328H52. Cognitive/Perception:CCT316H5, 326H5, 371H5, 373H5, 379H5; PSY312H5, 315H5, 316H5, 331H5, 351H5, 360H5, 362H5, 371H5, 372H5, 374H5, 385H5, 393H5, 397H53. Developmental/Abnormal/Social/Personality: CCT316H5, 326H5;PSY310H5, 311H5, 312H5, 315H5, 316H5, 318H5, 320H5, 321H5, 322H5, 324H5, 325H5, 327H5, 328H5, 331H5, 333H5, 340H5, 341H5, 343H5, 344H5, 345H5, 346H5, 353H5

Program #12 ERSPE1338 Forensic Science - Anthropology (Science)

Rationale for change: In order to set a more uniform standard set of requirements amongst the Forensic Science Specialist Programs (added to CHM require. "with 65% or better" --added MAT134Y5/134Y5/137Y5 as part of min. program requirement and added new Forensic Stats courses in place of Biometrics (BIO360H, 361H). --added PHY135Y, new Forensic Stats courses and some change in course options in order to provide larger list of course options.

Before:

Limited Enrolment: Admission into the Forensic Science-Anthropology Program is by Special Application ONLY. To be considered for admission into the program, ALL students, including students admitted into the 1st year Forensic Science category, **MUST** submit a direct on-line FSC Application, upon completing the 1st year minimum requirements. **Meeting the minimum requirements does not guarantee admission into the program. Minimum Requirements:**

1. Completion of 4.0 credits; including 3.0 science credits.
2. Completion of ANT101H5 and ANT102H5 with a grade of at least 65% in each (students applying to enrol after second year must have completed 8.0 credits and achieved at least 65% in each of ANT200Y5, 203Y5 and 204Y5).
3. Completion of CHM140Y5.
4. A minimum Cumulative Grade Point Average of at least **3.0** The actual CGPA requirement in any particular year may exceed this value, in order to achieve a proper balance between enrolments and teaching resources.

Application for admission into the program for ALL students can be found at: www.utm.utoronto.ca/~w3fsc
Forensic Science Applications Open: **Mid-February of each year** Forensic Science Application Deadline: **April 1st of each year** **NOTE:** RE - Transfer Students who have attended another post-secondary institution, or another Faculty within the University of Toronto (including St. George and UTSC), who wish to gain admission into the program **MUST** also apply through the Ontario Universities Application Centre: www.ouac.on.ca (OUAC 105 application form), in addition to applying directly to the Forensic Science Program.

First Year	ANT101H5, 102H5; CHM140Y5; BIO152H5, 153H5; FSC239Y5
Second Year	ANT200Y5, 203Y5, 204Y5, 205H5; FSC271H5/PHL271H5; BIO204H5/210H5
Third Year	ANT306H5, 334H5, 336H5/FSC310H5, ANT340H5; BIO338H5, 360H5, 361H5; FSC300H5, 302H5
Fourth Year	ANT415H5, 439Y5; FSC401H5, 402H5, 481Y5
Recommended	ANT338H5, 358H5, 438H5; WRI203H5, 307H5

After:

Limited Enrolment: Admission into the Forensic Science-Anthropology Program is by Special Application ONLY. To be considered for admission into the program, ALL students, including students admitted into the 1st year Forensic Science category, **MUST** submit a direct on-line FSC Application, upon completing the 1st year minimum requirements. **Meeting the minimum requirements does not guarantee admission into the program. Minimum Requirements:**

1. Completion of 4.0 credits; including 3.0 science credits.
2. Completion of ANT101H5 and ANT102H5 with a grade of at least 65% in each (students applying to enrol after second year must have completed 8.0 credits and achieved at least 65% in each of ANT200Y5/204Y5 and 203Y5).
3. Completion of CHM140Y5 with a grade of 65% or better.
4. Completion of MAT134Y5/135Y5/137Y
5. A minimum Cumulative Grade Point Average of at least **3.0** The actual CGPA requirement in any particular year may exceed this value, in order to achieve a proper balance between enrolments and teaching resources.

Application for admission into the program for ALL students can be found at: www.utm.utoronto.ca/~w3fsc
Forensic Science Applications Open: **Mid-February of each year** Forensic Science Application Deadline: **April 1st of each year** **NOTE:** RE - Transfer Students who have attended another post-secondary institution, or another Faculty within the University of Toronto (including St. George and UTSC), who wish to gain admission into the program **MUST** also apply through the Ontario Universities Application Centre: www.ouac.on.ca (OUAC 105 application form), in addition to applying directly to the Forensic Science Program.

First Year	ANT101H5, 102H5; CHM140Y5; BIO152H5, 153H5; FSC239Y5, MAT134Y5/135Y5/137Y5
Second Year	ANT200Y5/204Y5, 203Y5, 205H5; BIO204H5/210H5; FSC271H5/PHL271H5; PHY135Y5

Third and Fourth Years	1. ANT306H5, 334H5, 336H5/FSC310H5, ANT340H5; FSC300H5, 302H5, 439Y5, 481Y5; STA310H5, 311H5 2. 1.0 credits from the following: ANT414H5, 415H5; BIO338H5, 361H5; CSC333H5; FSC401H5, 402H5
Recommended	ANT338H5, 358H5, 438H5; WRI203H5, 307H5

Program #13 ERSPE1410 Forensic Science - Biology (Science)

Rationale for change: In order to set a more uniform standard set of minimum program requirements amongst the Forensic Science Specialist Programs (added Mat as min. requirement). --added new Forensic Stats courses in place of Biometrics (BIO360H, 361H)

Before: Limited Enrolment: Admission into the Forensic Science-Biology Program is by Special Application ONLY. To be considered for admission into the program, ALL students, including students admitted into the 1st year Forensic Science category, **MUST** submit a direct on-line FSC Application, upon completing the 1st year minimum requirements . **Meeting the minimum requirements does not guarantee admission into the program. Minimum Requirements:**

1. Completion of 4.0 credits; including 3.0 science credits
2. Completion of BIO152H5 and BIO153H5 with 65% or better
3. Completion of CHM140Y5 with 65% or better
4. A minimum Cumulative Grade Point Average of at least **3.0**. The actual CGPA requirement in any particular year may exceed this value, in order to achieve a proper balance between enrolments and teaching resources.

Application for admission into the program for ALL students can be found at: www.utm.utoronto.ca/~w3fsc
Forensic Science Applications Open: **Mid-February of each year** Forensic Science Application Deadline: **April 1st of each year** **NOTE:** RE - Transfer Students who have attended another post-secondary institution, or another Faculty within the University of Toronto (including St. George and UTSC), who wish to gain admission into the program **MUST** also apply through the Ontario Universities Application Centre: www.ouac.on.ca (OUAC 105 application form), in addition to applying directly to the Forensic Science Program.

First Year	1. BIO152H5, 153H5; CHM140Y5; MAT132Y5/134Y5/135Y5/137Y5/138Y5; FSC239Y5 2. (ANT101H5,102H5)/PSY100Y5
Second Year	1. BIO204H5, 206H5, 207H5, 210H5/215H5; CHM242H5, 243H5; PHY135Y5; FSC271H5/PHL271H5
Third and Fourth Years	1. BIO338H5, 360H5*, 361H5*; FSC300H5, 302H5, 310H5, 401H5, 402H5, 481Y5 *No substitute statistics course will be allowed for BIO360H5/361H5 except under exceptional circumstances. 2. 1.5 additional BIO credits at the 300/400 level.

After: Limited Enrolment: Admission into the Forensic Science-Biology Program is by Special Application ONLY. To be considered for admission into the program, ALL students, including students admitted into the 1st year Forensic Science category, **MUST** submit a direct on-line FSC Application, upon completing the 1st year minimum requirements . **Meeting the minimum requirements does not guarantee admission into the program. Minimum Requirements:**

1. Completion of 4.0 credits; including 3.0 science credits
2. Completion of BIO152H5 and BIO153H5 with 65% or better
3. Completion of CHM140Y5 with 65% or better
4. Completion of MAT134Y5/135Y5/137Y5
5. A minimum Cumulative Grade Point Average of at least **3.0**. The actual CGPA requirement in any particular year may exceed this value, in order to achieve a proper balance between enrolments and teaching resources.

Application for admission into the program for ALL students can be found at: www.utm.utoronto.ca/~w3fsc
 Forensic Science Applications Open: **Mid-February of each year** Forensic Science Application Deadline: **April 1st of each year** **NOTE:** RE - Transfer Students who have attended another post-secondary institution, or another Faculty within the University of Toronto (including St. George and UTSC), who wish to gain admission into the program **MUST** also apply through the Ontario Universities Application Centre: www.ouac.on.ca (OUAC 105 application form), in addition to applying directly to the Forensic Science Program.

First Year	1. BIO152H5, 153H5; CHM140Y5; FSC239Y5; MAT134Y5/135Y5/137Y5 2. (ANT101H5,102H5)/PSY100Y5
Second Year	1. BIO204H5, 206H5, 207H5, 210H5/215H5; CHM242H5, 243H5; FSC271H5/PHL271H5; PHY135Y5
Third and Fourth Years	1. BIO338H5; FSC300H5, 302H5, 310H5, 401H5, 402H5, 481Y5; STA310H5, 311H5 2. 1.5 additional BIO credits at the 300/400 level.

Program #14 ERSPE1505 Forensic Science - Psychology (Science)

Rationale for change: In order to set a more uniform standard set of minimum program requirements amongst the Forensic Science Specialist Programs (added to CHM require. "with 65% or better" --added new Forensic Stats courses in place of Biometrics/PSY stats course (BIO360H5, 361H5)/(PSY201H5,202H5) and added PHY135Y.

Before: Limited Enrolment: Admission into the Forensic Science-Psychology Program is limited to a relatively small number of students per year and admission is by Special Application ONLY. To be considered for admission into the program, ALL students, including students admitted into the 1st year Forensic Science category, **MUST** submit a direct on-line FSC Application, upon completing the 1st year minimum requirements . **Meeting the minimum requirements does not guarantee admission into the program. Minimum Requirements:**

1. Completion of 4.0 credits, including 3.0 science credits
2. Completion of CHM140Y5; MAT132Y5/134Y5/135Y5/137Y/138Y5
3. Completion of PSY100Y5 with a grade of at least 77%
4. A minimum Cumulative Grade Point Average of at least **3.0**. The actual CGPA requirement in any particular year may exceed this value, in order to achieve a proper balance between enrolments and teaching resources.

Application for admission into the program for ALL students can be found at: www.utm.utoronto.ca/~w3fsc
 Forensic Science Applications Open: **Mid-February of each year** Forensic Science Application Deadline: **April 1st of each year** **NOTE:** RE - Transfer Students who have attended another post-secondary institution, or another Faculty within the University of Toronto (including St. George and UTSC), who wish to gain admission into the program **MUST** also apply through the Ontario Universities Application Centre: www.ouac.on.ca (OUAC 105 application form), in addition to applying directly to the Forensic Science Program.

First Year	1. CHM140Y5; FSC239Y5; MAT132Y5/134Y5/135Y5/137Y5/138Y5; PSY100Y5, BIO152H5, 153H5
Second and Higher Years	1. (PSY201H5*, 202H5)/(BIO360H5*, 361H5) *No substitute statistics course will be allowed for PSY201H5 or BIO360H5 except under exceptional circumstances. 2. FSC271H5/PHL271H5; Bio204H5/210H5

	<ol style="list-style-type: none"> 3. PSY328H5/344H5 4. 2.5 credits from the following PSY courses: 0.5 credit must be taken from each of the following groups <ol style="list-style-type: none"> 1. Biological Bases of Behaviour: PSY252H5, 290H5, 295H5 2. Cognitive/Perception: PSY270H5, 280H5 3. Social/Personality/Abnormal: PSY220H5, 230H5, 240H5 4. Developmental: PSY210H5, 213H5
Third and Fourth Year	<ol style="list-style-type: none"> 1. 2.5 credits from the following: PSY320H5, 321H5, 325H5, 327H5, 328H5, 331H5, 343H5, 333H5, 340H5, 341H5, 344H5, 345H5, 346H5, 393H5 2. FSC300H5, 302H5, 401H5, 402H5

After:

Limited Enrolment: Admission into the Forensic Science-Psychology Program is limited to a relatively small number of students per year and admission is by Special Application ONLY. To be considered for admission into the program, ALL students, including students admitted into the 1st year Forensic Science category, **MUST** submit a direct on-line FSC Application, upon completing the 1st year minimum requirements .

Meeting the minimum requirements does not guarantee admission into the program. Minimum Requirements:

1. Completion of 4.0 credits, including 3.0 science credits
2. Completion of CHM140Y5 with 65% or better; MAT134Y5/135Y5/137Y
3. Completion of PSY100Y5 with a grade of at least 77%
4. A minimum Cumulative Grade Point Average of at least **3.0**. The actual CGPA requirement in any particular year may exceed this value, in order to achieve a proper balance between enrolments and teaching resources.

Application for admission into the program for ALL students can be found at: www.utm.utoronto.ca/~w3fsc
Forensic Science Applications Open: **Mid-February of each year** Forensic Science Application Deadline:

April 1st of each year **NOTE:** RE - Transfer Students who have attended another post-secondary institution, or another Faculty within the University of Toronto (including St. George and UTSC), who wish to gain admission into the program **MUST** also apply through the Ontario Universities Application Centre: www.ouac.on.ca (OUAC 105 application form), in addition to applying directly to the Forensic Science Program.

First Year	<ol style="list-style-type: none"> 1. CHM140Y5; FSC239Y5; MAT134Y5/135Y5/137Y5; PSY100Y5, BIO152H5, 153H5
Second and Higher Years	<ol style="list-style-type: none"> 1. (PSY201H5*, 202H5)/(BIO360H5*, 361H5)/(STA310H5, 311H5) *No substitute statistics course will be allowed for PSY201H5, BIO360H5 or STA310H except under exceptional circumstances. 2. FSC271H5/PHL271H5; BIO204H5/210H5 3. PSY328H5/344H5 4. PHY135Y 5. 2.5 credits from the following PSY courses: 0.5 credit must be taken from each of the following groups <ol style="list-style-type: none"> 1. Biological Bases of Behaviour: PSY252H5, 290H5, 295H5 2. Cognitive/Perception: PSY270H5, 280H5 3. Social/Personality/Abnormal: PSY220H5, 230H5, 240H5 4. Developmental: PSY210H5, 213H5
Third and Fourth Year	<ol style="list-style-type: none"> 1. 2.0 credits from the following: PSY320H5, 321H5, 325H5, 327H5, 328H5, 331H5, 343H5, 333H5, 340H5, 341H5, 344H5, 345H5, 346H5, 393H5 2. 1.0 credits from the following: CSC333H5; FSC300H5,

Program #15 ERSPE1540 Statistics, Applied (Science)

Rationale for change: The program only requires 0.5 FCE in CSC. As CSC148H has CSC108H as a prerequisite, it suffices to only list CSC108H in the program requirements.

Before: Within an Honours degree, 10.0 credits are required.

1. MAT102H, (132Y/134Y/135Y/137Y, 232H)/138Y, 222H/223H/248Y,212H/242H/258Y; MAT133Y is *not* acceptable
2. CSC108H/148H
3. STA(257H, 248H/258H)/ECO227Y, STA261H, 302H/331H, 332H
4. Two of STA412H, 413H, 437H, 442H, 457H
5. 3.0 additional credits (including at least 2.0 credits at the 300+ level) in STA, ACT or from CSC321H, 350H, 354H, 411H; ECO327Y, GGR448H; MAT223H5*, 252H5*, 311H5, 334H5*, 344H5, 368H5, 378H5, 438H5; BIO360H5**, PSY201H5**, SOC300Y5**

After: Within an Honours degree, 10.0 credits are required.

1. MAT102H, (132Y/134Y/135Y/137Y, 232H)/138Y, 222H/223H/248Y,212H/242H/258Y; MAT133Y is *not* acceptable
2. CSC108H
3. STA(257H, 248H/258H)/ECO227Y, STA261H, 302H/331H, 332H
4. Two of STA412H, 413H, 437H, 442H, 457H
5. 2 to 3.5 additional credits (including at least 2.0 credits at the 300+ level) in STA, ACT or from CSC321H, 350H, 354H, 411H; ECO327Y, GGR448H; MAT223H5*, 252H5*, 311H5, 334H5*, 344H5, 368H5, 378H5, 438H5; BIO360H5**, PSY201H5**, SOC300Y5**

Program #16 ERSPE1883 Exceptionality in Human Learning (Science)

Rationale for change: **Completion of 8.0 FCE for admission to program** The rationale is to base admission decisions to competitive and coveted programs on a broader basis of courses to guarantee that those admitted are indeed suitable. The current admission system has often admitted excellent first year students who could not maintain strong academic achievement in second year and beyond but were eligible to enroll in labs and seminars normally reserved and designed for stronger students. We removed "OAC" from admission requirements to all our programs as "OAC" courses have not been offered by the high schools now for several years.

Before: Limited Enrolment: Enrolment is limited to students who have:

1. completed any OAC Mathematics/Gr.12(4U) Mathematics (students without one of these, consult PSY Department);
2. completed 4.0 credits;
3. a grade of at least 75% in PSY100Y5;
4. successfully completed 1.0 credit from ANT100Y5/(101H5, 102H5)/SOC101Y5/BIO151Y5/(152H5, 153H5)/204H5/205H5/ 206H5/207H5; and
5. a minimum CGPA of 2.70.

Meeting the minimum grade requirements does not guarantee admission. Students not initially meeting these requirements may be admissible after meeting the second-year requirements. Further information is available on the Psychology Department web site: www.utm.utoronto.ca/psychology

First Year	PSY100Y5; SOC101Y5/ ANT100Y5/(101H5, 102H5)/(BIO152H5, BIO153H5)/1.0 credit from BIO204H5, 205H5, 206H5, 207H5
Higher Years	

	<ol style="list-style-type: none"> 1. PSY201H5/ECO220Y5/227Y5/STA220H5/BIO360H5/SOC300Y5 2. PSY210H5, 213H5, 442Y5 3. 0.5 credit from the following: PSY202H5 (or equivalent), 240H5, 270H5, 280H5, 290H5, 295H5 4. 3.0 credits from the following: PSY310H5, 311H5, 312H5, 315H5, 316H5, 318H5, 319H5, 321H5, 325H5, 331H5, 333H5, 340H5, 341H5, 343H5, 344H5, 346H5, 353H5, 374H5, 385H5, 393H5 5. at least 0.5 credit from the following: PSY400Y5, 403H5, 404H5, 405H5, 406H5, 410H5, 415H5, 440H5, 495H5. 6. 2.0 credits from one of the following lists: <ol style="list-style-type: none"> 1. ANT203Y5, 204Y5, 206H5, 241Y5, 304Y5, 331H5, 332Y5, 334H5, 335H5, 339Y5, 362H5, 434H5, 460H5 2. SOC202Y5, 210Y5, 211H5, 214Y5, 215Y5, 252H5, 301Y5, 302H5, 303H5, 305H5, 307H5, 310H5, 311Y5, 318Y5, 319Y5, 332H5, 333H5, 346Y5, 347H5, 365H5, 368H5, 371H5 3. BIO204H5, 205H5, 206H5, 207H5, 210H5, 215H5, 304H5, 310H5, 315H5, 341H5, 370Y5, 372H5, 380H5, 407H5, 443H5, 452H5, 477H5; ANT203Y5, 331H5, 332Y5, 334H5, 339Y5, PSL201Y1 7. 2.5 additional credits to be selected from the following (no more than 1.0 credit from any one discipline): <p>ANT Any course in 5 a) not counted previously SOC Any course in 5 b) not counted previously BIO Any course in 5 c) not counted previously CCT CCT326H5, 379H5 CHM CHM242H5, 243H5, 341H5, 345H5, 347H5, 362H5, 371H5 ENG ENG234H5 FGI FGI225Y5 HIS HIS308H5, 326Y5 LIN LIN100Y5, 200H5, 256H5, 415H1 JAL JAL253H5, 254H1, 355H5, 372H5 JLP JLP471H1 JLS JLS474H1 PHL PHL243H5, 244H5, 255H5, 267H5, 271H5, 272H5, 274H5, 277Y5, 282H5, 283H5, 290H5, 350H5, 355H5 RLG RLG224H5, 309H5 SCI SCI398Y5, 499H5</p>
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After:

Limited Enrolment: Enrolment is limited to students who have:

1. completed any Gr.12(4U) Mathematics or equivalent;
2. completed 8.0 credits;
3. at least 75% as the average of PSY201H5, 210H5, 213H5 and at least 1.0 FCE in 200 series ANT/BIO/SOC courses
4. a minimum CGPA of 2.70.

Meeting the minimum grade requirements does not guarantee admission.

First Year	PSY100Y5; SOC101Y5/ANT100Y5/(101H5, 102H5)/(BIO152H5, BIO153H5)/1.0 credit from BIO204H5, 205H5, 206H5, 207H5
Second Year	<ol style="list-style-type: none"> 1. PSY201H5/ ECO220Y5/227Y5/ STA220H5/ BIO360H5/ SOC300Y5 2. PSY210H5, 213H5 and 3. 0.5 credit from the following: PSY202H5 (or equivalent), 240H5, 270H5, 280H5, 290H5, 295H5

Second and Higher Years	<ol style="list-style-type: none"> 1. 3.0 credits from the following: PSY310H5, 311H5, 312H5, 315H5, 316H5, 318H5, 319H5, 321H5, 325H5, 331H5, 333H5, 340H5, 341H5, 343H5, 344H5, 346H5, 353H5, 374H5, 385H5, 393H5 2. PSY442Y5 and at least 0.5 credit from the following: PSY400Y5, 403H5, 404H5, 405H5, 406H5, 410H5, 415H5, 440H5, 495H5 3. 2.0 credits from one of the following lists: <ol style="list-style-type: none"> 1. ANT203Y5, 204Y5, 206H5, 241Y5, 304H5, 331H5, 332Y5, 334H5, 335H5, 339Y5, 362H5, 364H5, 433H5, 434H5, 460H5 2. SOC202Y5, 209H5, 210Y5, 211H5, 214Y5, 215Y5, 216H5, 252H5, 301Y5, 302H5, 305H5, 307H5, 310H5, 319Y5, 323H5, 332H5, 333H5, 346Y5, 348H5, 365H5, 368H5, 371H5, 455H5, 456H5 3. BIO204H5, 205H5, 206H5, 207H5, 210H5, 215H5, 304H5, 310H5, 315H5, 341H5, 370Y5, 372H5, 380H5, 407H5, 443H5, 452H5, 477H5; ANT203Y5, 331H5, 332Y5, 334H5, 339Y5, PSL201Y1 4. 2.5 additional credits to be selected from the following (no more than 1.0 credit from any one discipline): <p>ANT Any course in 5 a) not counted previously SOC Any course in 5 b) not counted previously BIO Any course in 5 c) not counted previously CCT CCT326H5, 379H5 CHM CHM242H5, 243H5, 341H5, 345H5, 347H5, 362H5, 371H5 ENG ENG234H5 FGI FGI225Y5 HIS HIS308H5, 326Y5 LIN LIN100Y5, 200H5, 256H5, 372H5, 415H1 JAL JAL253H5, 254H1, 355H5, 372H5 JLP JLP471H1 JLS JLS474H1 PHL PHL243H5, 244H5, 255H5, 267H5, 271H5, 272H5, 274H5, 277Y5, 282H5, 283H5, 290H5, 350H5, 355H5 RLG RLG224H5, 309H5 SCI SCI398Y5, 499H5</p>
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Program #17 ERSPE2470 Behaviour, Genetics, and Neurobiology (Science)

Rationale for change: **Completion of 8.0 FCE for admission to program** The rationale is to base admission decisions to competitive and coveted programs on a broader basis of courses to guarantee that those admitted are indeed suitable. The current admission system has often admitted excellent first year students who could not maintain strong academic achievement in second year and beyond but were eligible to enroll in labs and seminars normally reserved and designed for stronger students. We removed "OAC" from admission requirements to all our programs as "OAC" courses have not been offered by the high schools now for several years.

Before: Limited Enrolment: Enrolment is limited to students who have:

1. completed 4.0 credits;
2. a grade of at least 77% in PSY100Y5;
3. at least 70% as the average of BIO152H5 and BIO153H5;
4. successfully completed CHM140Y5 and MAT132Y5 /134Y5/ 135Y5/ 137Y5/ 138Y5; and
5. a minimum CGPA of 2.50

Students not initially meeting these requirements may be admissible after meeting the second-year requirements. Further information is available on the Psychology Department web site: www.utm.utoronto.ca/psychology

Second Year	<p>1. (PSY201H5, 202H5)/ (BIO360H5, 361H5) 2. BIO205H5; BIO206H5; BIO207H5; PSY252H5; PSY290H5</p> <p><i>Second year notes:</i></p> <ul style="list-style-type: none"> ◊ BIO204H5 (Introduction to Physiology) is required for the several courses in the Neurobiology stream ◊ BIO215H5 (Laboratory in Molecular Biology and Genetics) is required for several courses in the Genetics stream ◊ PSY210H5 (Introduction to Developmental Psychology) is required for several courses in the Behavioural stream <p>Students are encouraged to consider taking these courses depending on their planned course of study.</p>
Third Year	<p><i>1.0 FCE from each of the following three streams:</i></p> <ol style="list-style-type: none"> 1. Behaviour: BIO318H5/328H5, PSY316H5, PSY318H5, PSY346H5, PSY351H5, PSY353H5, PSY355H5, PSY357H5, PSY360H5, PSY362H5, PSY385H5, PSY393H5, PSY395H5, PSY397H5, PSY398H5, PSY399H5 2. Genetics: BIO314H5, BIO315H5, BIO341H5, BIO372H5, BIO407H5, PSY355H5 3. Neurobiology: BIO304H5, BIO309H5, BIO310H5, BIO403H5, PSY318H5, PSY346H5, PSY385H5, PSY393H5, PSY397H5 , PSY399H5
Fourth Year	<ol style="list-style-type: none"> 1. one seminar from the following: BIO406H5, BIO407H5, BIO478H5, PSY490H5, PSY495H5 2. one thesis/ research project from the following: BIO481Y5, PSY400Y5, PSY403H5/404H5/405H5/406H5

After:

Limited Enrolment: Enrolment is limited to students who have:

1. completed 8.0 credits;
2. successfully completed BIO152H5, 153H5, CHM140Y5 and MAT132Y5/134Y5/135Y5/137Y5/138Y5;
3. at least 73% as the average of PSY201H5, 202H5, and at least 1.0 FCE from: BIO205H5/206H5/207H5/PSY252H5/290H5
4. a minimum CGPA of 2.50

Second Year	<p>1. (PSY201H5, 202H5)/(BIO360H5, 361H5) 2. BIO205H5; BIO206H5; BIO207H5; PSY252H5; PSY290H5</p> <p><i>Second year notes:</i></p> <ul style="list-style-type: none"> ◊ BIO204H5 (Introduction to Physiology) is required for the several courses in the Neurobiology stream ◊ BIO215H5 (Laboratory in Molecular Biology and Genetics) is required for several courses in the Genetics stream ◊ PSY210H5 (Introduction to Developmental Psychology) is required for several courses in the Behavioural stream
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	Students are encouraged to consider taking these courses depending on their planned course of study.
Third Year	<p>1.0 FCE from each of the following three streams:</p> <ol style="list-style-type: none"> Behaviour: BIO318Y5/328H5, PSY316H5, 318H5, 346H5, 351H5, 353H5, 355H5, 357H5, 360H5, 362H5, 385H5, 393H5, 395H5, 397H5, 398H5, 399H5 Genetics: BIO314H5, 315H5, 341H5, 372H5, 407H5, PSY355H5 Neurobiology: BIO304H5, 309H5, 310H5, 403H5, PSY318H5, 346H5, 385H5, 393H5, 397H5, 399H5
Fourth Year	<ol style="list-style-type: none"> one seminar from the following: BIO406H5, 407H5, 478H5, PSY490H5, 495H5 one thesis/ research project from the following: BIO481Y5, PSY400Y5, 403H5/404H5/405H5/406H5

Program #18 ERSPE2511 Mathematical Sciences (Science)

Rationale for change: The new course MAT202H5 will introduce students to the fundamental concept of abstraction. This fills a gap in our existing curriculum. It is added as a program requirement as part of a Dean's writing initiative. Among optional third and fourth year courses listed under 2, "four of" becomes "three of", to keep the total number of courses the same.

Before:

Second Year	CSC207H5/209H5/236H5/260H5/263H5/270H5; MAT223H5, 224H5, 232H5, 242H5; STA257H5, 258H5
Third &Fourth Years	<ol style="list-style-type: none"> MAT334H5, 368H5 Four of MAT301H5, 302H5, 309H5, 311H5, 315H5, 332H5, 344H5 MAT492H5 plus 0.5 additional credit in MAT at the 400 level 1.5 additional credits at the 300+ level in APM/CSC/MAT/STA

After:

Second Year	CSC207H5/209H5/236H5/260H5/263H5/270H5; MAT202H5, 223H5, 224H5, 232H5, 242H5; STA257H5, 258H5
Third &Fourth Years	<ol style="list-style-type: none"> MAT334H5, 368H5 Three of MAT252H5, 301H5, 302H5, 309H5, 311H5, 315H5, 332H5, 344H5 MAT492H5 plus 0.5 additional credit in MAT at the 400 level 1.5 additional credits at the 300+ level in APM/CSC/MAT/STA

New Courses

Course #1 BIO211H5 Dinosaurs and the History of Life I (SCI)

Description:	This course provides an overview of major events in the evolution of life. Special focus will be on major events including origin of life and Cambrian explosion, plant and animal radiations onto land, Mesozoic evolution of dinosaurs and flowering plants, and Cenozoic diversification of mammals. Course consists of two lectures and one online tutorial per week. This is a biology course for students in the Humanities and Social Sciences as well as other non-Biology Sciences. This course is not open to Biology students.
Exclusion:	None
Prerequisite:	None
Corequisite:	None
Rationale:	Course is an introductory-level lecture series designed to satisfy science requirements of non-majors through a survey of basic biological concepts based on examination of the history of life. Specific concepts include macroevolution, extinction, basic ecology, biodiversity, and climate change (including anthropogenic global warming).
No. Hours Instruction:	26L, 12T
Offered at St George:	No
Revived Course:	No

Course #2 BIO212H5 Dinosaurs and the History of Life II (SCI)

Description:	This course continues from BIO211H5, examining major evolutionary events through time, focusing on Mesozoic evolution of dinosaurs and flowering plants and Cenozoic diversification of mammals. Course consists of two lectures per week and four study sessions at the Royal Ontario Museum and Toronto Zoo.
Exclusion:	None
Prerequisite:	BIO211H5
Corequisite:	None
Rationale:	Course is an introductory-level lecture series designed to satisfy science requirements of non-majors through a survey of basic biological concepts based on examination of the history of life. Specific concepts include macroevolution, extinction, basic ecology, biodiversity, and climate change (including anthropogenic global warming).
No. Hours Instruction:	26L, 12P
Offered at St George:	No
Revived Course:	No

Course #3 BIO399Y5 Research Opportunity (SCI)

Description:	This course provides third year undergraduate students (after completion of at least 9.5 but not more than 14 credits), who have developed some knowledge of Biology and its research methods, another opportunity to work in the research project of a professor in return for course credit. Students enrolled have the opportunity to become involved in original research, enhance their research skills and share in the excitement of acquiring new knowledge and in the discovery process of science. Participating faculty members post their project descriptions for the following summer and fall/winter sessions on the Biology homepage www.utm.utoronto.ca/~w3bio/homepage/index.htm beginning mid-February. Details regarding the application process will also be posted on this website.
Exclusion:	None
Prerequisite:	None
Corequisite:	None
Rationale:	There is a perceived need for this course because BIO299Y5 is not particularly attractive to faculty, since students are not sufficiently prepared to enter a lab and contribute to research. At the same time, BIO481Y5 has a large enrolment and is often the last opportunity for many students to do research in a lab environment. BIO399Y will bridge this gap nicely, and will prepare many students for a more effective and successful research project in

BIO481Y. With BIO299 and BIO481, this course potentially allows students a continuous research experience. This new offering is also in keeping with the proposal to enhance the undergraduate experience, as promoted by the U of T president and provost.

No. Hours
Instruction:
Offered at St George: No
Revived Course: No

Course #4 CSC288H5 Tools of the Trade (SCI)

Description: A practical introduction to Computer Science for non Computer Scientists. Introduction to common computational tools with an emphasis on their use in solving problems in areas outside of Computer Science (Management, Psychology, Biology etc.). Introduction to databases, queries, and reporting. Use of spreadsheets to capture, represent, and process data. Common data formats, how tools use them, and how to parse and transform data. Using tools to gather, compile, analyze, and visualize data. Practical (P) sections consist of supervised work in the computer laboratory. No programming experience is necessary.

Exclusion: CSC104H5, CSC 120H1

Prerequisite: 1.0 credits in the student's Major or Specialist program

Corequisite: None.

Recommended Preparation: Grade 12 Math

Rationale: We introduce non-CS students to essential CS concepts (algorithms, variables, conditional execution, iteration, arrays, indirection, etc.) and tools that use them. We show students the applicability of these concepts and tools to their areas of specialization. Our goal is to give these students a powerful tool set which they can effectively apply to their area of specialization. Their mastery of these concepts will allow them to view their areas in new ways, allowing them to ask and answer new questions and lead in their chosen area. Moreover, as a second year course it will have added benefit that a student could derive after taking some courses in his/her own discipline. Such a student will be better able to understand the CSC material and how it can apply it to his/her own field.

The similar course at St. George is CSC 120H1, Computer Science for the Sciences. The UTM course 288H5 is offered at the second-year level; arguments supporting this decision are given above.

No. Hours
Instruction: 26L, 13T
Offered at St George: Yes
Revived Course: No

Course #5 CSC301H5 Introduction to Software Engineering (SCI)

Description: An introduction to agile development methods appropriate for medium-sized teams and rapidly-moving projects. Basic software development infrastructure; requirements elicitation and tracking; estimation and prioritization; teamwork skills; basic UML; design patterns and refactoring; security.

Exclusion: CSC 340H5, 407H5

Prerequisite: CSC 207H5, 209H5

Corequisite: None

Recommended Preparation: None

Rationale: The set of Software Engineering courses (CSC 340H5 and 407H5) are being replaced by CSC 301H5 and CSC 490H5. This is an evolutionary step, in which the new courses represent a better approach to introducing and covering the material.

No. Hours
Instruction: 26L, 13T
Offered at St George: Yes
Revived Course: No

Course #6 CSC490H5 Capstone Design Course (SCI)

Description: This half-course gives students experience solving a substantial problem that may span several areas of Computer Science. Students will define the scope of the problem, develop a solution plan, produce a working implementation, and present their work using written, oral, and (if suitable) video reports. Class time will focus on the project, but may include some lectures. The class will be small and highly interactive.

Topics, themes and required preparation will vary by instructor.

Exclusion: None.

Prerequisite: Permission of the instructor; CGPA 3.0/enrollment in a CSC subject POST.

Corequisite: None.

Recommended Preparation: None.

Rationale: The set of Software Engineering courses (CSC 340H5 and 407H5) are being replaced by CSC 301H5 and CSC 490H5. This is an evolutionary step, in which the new courses represent a better approach to introducing and covering the material.

No. Hours Instruction: 52L

Offered at St George: No

Revived Course: No

None.

Course #7 ERS321H5 Past and Present Global Change (SCI)

Description: The goals of this class are to discuss the geologic record of climate change and present an overview of the methods used to reconstruct the earth's climate history and the techniques used to determine the timing of environmental changes. Topics to be addressed will include paleoclimatic reconstruction, climate and climatic variation, dating methods, and climate proxies. In addition, periods of past climate change will be highlighted with particular emphasis on climate change during the recent past. [39L]

Prerequisite: **Two of:** ERS201H5, ERS202H5, ERS203H5

Rationale: New course introduced to take into account interest and expertise of new faculty member.

No. Hours Instruction: [39L]

Offered at St George: No

Revived Course: No

Course #8 GGR399Y5 Research Opportunity Program (SSc,SCI)

Description: This course provides senior undergraduate students who have developed knowledge of geography and have studied its research methods the chance to work as part of a research team, under the direction of a professor, in exchange for course credit. Students have the opportunity to be involved in original research, enhance their research skills and participate in the excitement and discovery of facilitating new knowledge. Project descriptions for participating faculty members for the following summer and fall/winter semesters are posted on the ROP website in mid-February and students are invited to apply at that time. See Research Opportunity Program (page.....) for more details. [26P]

Prerequisite: 1.0 credit from GGR276H5,277H5,278H5

Recommended Preparation: Minimum of 8.0 Credits

Rationale: The Department of Geography would like to continue to provide undergraduates with research opportunities through the ROP Program. We have, however, found that most second year students in Geography are not adequately prepared to assist in the type of research projects which faculty in our department suggest or propose as 299Y courses. Consequently, we have decided to discontinue the 299Y option and replace it with a 399Y course. We anticipate that students who have completed 8 credits of instruction as well as at least two research methods courses (offered as 200-level courses) will be able to participate meaningfully in faculty sponsored research initiatives.

No. Hours Instruction: 26P

No

Offered at St
George:
Revived Course: No

Course #9 GGR406H5 Advanced Biogeochemistry (SCI)

Description: Biogeochemistry explores the intersection of biological, chemical, and geological processes that shape the environment. In an era of unprecedented human-induced environmental and climate change, research in this field is advancing rapidly. This seminar course explores the processes underlying biogeochemical cycles and examines how humans alter these cycles. Topics include microbial and plant-mediated carbon and nutrient cycling in terrestrial and aquatic ecosystems, controls on greenhouse gas fluxes and climate change mitigation strategies in soils, the role of biological diversity in biogeochemical processes, and exploration into how new molecular and isotope techniques are improving the study of biogeochemical processes. [26S]

Prerequisite: 4th year standing in GGR, ENV, or P.I.

Rationale: New faculty member with biogeochemistry expertise

No. Hours Instruction: 26S

Offered at St George: No

Revived Course: No

Course #10 PHY247H5 Optics (SCI)

Description: A comprehensive and up-to-date introduction to classical optics. Topics include: the electromagnetic theory of light, geometrical optics, and phenomena such as polarization, interference and diffraction. The course also covers the interaction of light with matter, the optics of the eye, the basics of coherence theory, lasers and selected modern applications in research and everyday life. [13L, 26P, 13T]

Prerequisite: PHY241H5, PHY245H5

Rationale: New course introduced to take into account interest and expertise of new faculty member as well as to prepare students for the new 3rd year and 4th Physics courses.

No. Hours Instruction: [13L, 26P, 13T]

Offered at St George: No

Revived Course: No

Course #11 PHY424H5 Biophysical Techniques (SCI)

Description: The laboratory course will provide hands on experience with advanced biophysical techniques applied for structural and kinetic characterization of biological systems. The following techniques will be introduced: absorption, fluorescence, linear and circular dichroism spectroscopy, confocal microscopy, optical tweezers, electron microscopy, atomic force microscopy, patch clamp, flash photolysis, photoelectric spectroscopy, photo-acoustics, calorimetry, and oxygen electrode [39P].

Prerequisite: PHY331H5, 332H5

Corequisite: PHY441H5

Rationale: New laboratory course introduced to provide students with opportunity to work with advanced biophysical measurement techniques. Such exposure is a crucial component of new Biological Physics Specialist program.

No. Hours Instruction: [39P]

Offered at St George: No

Revived Course: No

Course #12 PHY441H5 Physics of the Cell (SCI)

Description: A biophysical description of the structural properties and biological processes of the cell. The course will focus on: cell division, differentiation and growth, cell motility and muscular movement, cellular communication, cellular signal

transduction and control, neural and molecular networks, nerve impulses, action potential, synaptic signal transmission, bioenergetics of the cell, photosynthesis and respiration, photobiophysics, photoreception, and bioluminescence. [26L, 13T]

Prerequisite: PHY331H5, PHY332H5
Corequisite: Phy424H5
Rationale: New course introduced to take into account interest and expertise of new faculty member. Course forms essential component of new Biological Physics Specialist program.
No. Hours Instruction: [26L, 13T]
Offered at St George: No
Revived Course: No

Course #13 PSY322H5 Narrative Psychology (SCI)

Description: This course will examine narrative research in psychology, with a specific focus on the role of narrative in studying self and personality development. This course will examine how narratives constitute an innovative research method for studying human development and functioning, as well as how narratives constitute psychological phenomena themselves, namely identity. Readings, lectures, and discussions will include topics such as the development of narrative skills, individual and cultural differences in the production and use of narrative, narrative as a social construction, and the relation between narrative and health. [39L]

Prerequisite: PSY201H5/equivalent, 210H5/213H5, 220H5/230H5
Rationale: Emerging sub field of Psychology. Significant research area of faculty member and of broad interest to students.
No. Hours Instruction: 39L
Offered at St George: No
Revived Course: No

Course #14 PSY324H5 The Science of Wellbeing (SCI)

Description: What makes people happy? Does money buy happiness or do unhappy people not know where to shop? Are people in California happier than people in Ontario? Does marriage make men happier and women unhappier? This course reviews the scientific evidence regarding these and other questions about the determinants of happiness from an interdisciplinary perspective (psychology, economics, sociology, philosophy, & biology) that ranges from molecular genetics to cross-national comparisons. [39L]

Prerequisite: PSY201H5/equivalent, 220H5/230H5
Rationale: Emerging sub field of Psychology. Significant research area of faculty member and of broad interest to students.
No. Hours Instruction: 39L
Offered at St George: No
Revived Course: No

Course #15 SOC350H5 Quantitative Analysis I (SSc,SCI)

Description: The first course of the quantitative analysis includes basic descriptive statistics such as frequencies, central tendency and dispersion; sampling distributions as bases for inferential statistics; and estimate of confidence intervals and some basic hypothesis testing techniques. [26L]

Exclusion: SOC300Y5, BIO360H5, 361H5, ECO222Y5, PSY201H5, 202H5, any STA course.

Prerequisite: SOC100H5/101Y5, 200Y/(SOC221H5, 222H5)

Rationale: This course splits an existing year long course into semester courses to provide faculty and students greater flexibility.

No. Hours Instruction: 26L

Offered at St George: No
Revived Course: No

Course #16 SOC351H5 Quantitative Analysis II (SSc,SCI)

Description: The second course of the quantitative analysis mainly focuses on inferential statistics, including hypothesis testing, bivariate measure of associations, and introduction to simple and multiple regressions. It focuses on understanding of the logics of statistical procedures and interpretations of statistical results, with application of quantitative software on real world data. [26L]

Exclusion: SOC300Y5, BIO360H5, 361H5, ECO222Y5, PSY201H5, 202H5, any STA course.

Prerequisite: SOC100H5/101Y5, 200Y/(SOC221H5, 222H5), 350H5

Rationale: This course splits an existing year long courses into semester courses to provide faculty and students with greater flexibility.

No. Hours Instruction: 26L

Offered at St George: No
Revived Course: No

Course #17 STA310H5 Statistics for Forensic Sciences I (SCI)

Description: An introduction to the principles and procedures of statistics for the forensic sciences. The course covers both classical and Bayesian methodologies. Topics from classical statistics include data presentation, statistical distributions, estimation, hypothesis testing, introduction to ANOVA, introduction to regression, and contingency tables. Topics from Bayesian statistics include subjective probability, conditional probabilities, prior and posterior probabilities. Statistical computing will be required. [39L, 13T]

Exclusion: BIO360H, BIO361H5, ECO220Y5, ECO227H, PSY201H,P SY202H5, SOC300Y5, STA220H5, STA221H5, STA257H5,STA258H5

Prerequisite: MAT132Y5/MAT134Y5/MAT135Y5/MAT137Y5/MAT138Y5

Rationale: Bayesian inference is the basis of most statistical application in the forensic sciences. UTM does not offer a course devoted to applied Bayesian statistics; the topic is covered from a theoretical standpoint in STA412H5. STA310H5 provides forensic science students with an introduction to both classical and Bayesian applied statistics.

No. Hours Instruction: 39L,13T

Offered at St George: No
Revived Course: No

Course #18 STA311H5 Statistics for Forensic Sciences II (SCI)

Description: A continuation of STA310H5. Topics from Bayesian statistics include conditional probabilities, estimation, likelihood ratios, prior and posterior probabilities and distributions. Applications to forensic sciences include propositions, relevant and irrelevant information, discriminating power, value of evidence, transfer evidence, introduction to fibre and DNA analysis. Statistical computing will be required. [39L, 13T]

Prerequisite: MAT132Y5/MAT134Y5/MAT135Y5/MAT137Y5/MAT138Y5, STA310H5/258H5/221H5/ECO227Y5/BIO361H5/PSY202H5

Rationale: Bayesian inference is the basis of most statistical application in the forensic sciences. UTM does not offer a course devoted to applied Bayesian statistics; the topic is covered from a theoretical standpoint in STA412H5. STA311H5 builds on the introductory material in the prerequisite STA310H5, and covers Bayesian statistics with emphasis on forensic application.

No. Hours Instruction: 39L, 13T

Offered at St George: No
Revived Course: No

Courses - Resource Implications

Course #1 CSC288H5 Tools of the Trade

Resource implications: This new course does not replace an existing course. The department must commit additional faculty time to deliver this course.

Course #2 GGR307H5 Environmental Soil Sciences

Resource implications: Field trip supplies, laboratory facility, computer lab with Microsoft Excel for data analyses. (Dept budget)

Course #3 MAT202H5 Introduction to Abstraction

Resource implications: Funded by Dean under Student Writing Initiatives

Course #4 STA310H5 Statistics for Forensic Sciences I

Resource implications: New course - needs MCS instructor and 112 TA hours

Course #5 STA311H5 Statistics for Forensic Sciences II

Resource implications: new course - needs MCS instructor and 112 TA hours

Deleted Courses

Course #1 CSC340H5 Requirements Engineering

Rationale: This course will no longer be offered. Its place, and that of 407, are being taken over by the new CSC 301H5 and CSC 490H5 courses.

Course #2 CSC407H5 Software Architecture and Design

Rationale: This course will no longer be offered. Its place, and that of 340, are being taken over by the new CSC 301H5 and CSC 490H5 courses.

Course #3 FSC301H5 Forensic Identification

Rationale: No longer offered --was changed in previous year to a new course FSC300H5

Course #4 GGR299Y5 Research Opportunity Program

Rationale: This course will be replaced by GGR399Y.

Course #5 SOC300Y5 Quantitative Analysis

Rationale: Being replaced by two half courses, SOC350H5 and SOC351H5, to allow greater flexibility for students and faculty.

Course #6 STA412H5 Estimation and Testing

Rationale: renumbered to be STA413

Renumbered Courses

Course #1 ACT239H5 Mathematics of Investment and Credit

Before: ACT240H5

After: ACT239H5

Rationale: Changes have been made to ACT240H1, these changes reflect changes in the Society of Actuary qualification process. ACT240H5 has not incorporated these changes since there are no actuaries at UTM, there is no actuarial science program at UTM, only a couple of UTM students have ever been successful in their application to the St George Act Sci program (which requires MAT137 with a mark of at least 70%) . Since ACT240H5 is no longer equivalent to ACT240H1, it has been renumbered as ACT239H5.

Course #2 ACT244H5 Fundamental Principles of Actuarial Science

Before: ACT245H5

After: ACT244H5

Rationale: Changes have been made to ACT245H1, these changes reflect changes in the Society of Actuary qualification process. ACT245H5 has not incorporated these changes since there are no actuaries at UTM, there is no actuarial science program at UTM, only a couple of UTM students have ever been successful in their application to the St George Act Sci program (which requires MAT137 with a mark of at least 70%) . Since ACT245H5 is no longer equivalent to ACT245H1, it has been renumbered as ACT244H5.

Course #3 CSC333H5 Forensic Computing

Before: CSC233H5

After: CSC333H5

Rationale: The course number was changed from a 200-level course to a 300-level course, to make it more attractive to upper-year FSC students. It is an elective course and can be taken any time after first-year FSC 239Y5.

Course #4 CSC490H5 Capstone Design Course

Before: CSC 490H

After: CSC490H5

Rationale: The set of Software Engineering courses (CSC 340H5 and 407H5) are being replaced by CSC 301H5 and CSC 490H5. This is an evolutionary step, in which the new courses represent a better approach to introducing and covering the material.

Course #5 PSY322H5 Narrative Psychology

Before: PSY32XH5

After: PSY322H5

Rationale: Emerging sub field of Psychology. Significant research area of faculty member and of broad interest to students.

Course #6 PSY324H5 The Science of Wellbeing

Before: PSY32ZH

After: PSY324H5

Rationale: Emerging sub field of Psychology. Significant research area of faculty member and of broad interest to students.

Rewighted Courses

Course #1 CSC490H5 Capstone Design Course

Before: CSC 490H

After: CSC490H5

Rationale: The set of Software Engineering courses (CSC 340H5 and 407H5) are being replaced by CSC 301H5 and CSC 490H5. This is an evolutionary step, in which the new courses represent a better approach to introducing and covering the material.

Courses - Description Changes

Course #1 BIO360H5 Biometrics I

- Before:** An introduction to the basic principles and procedures of biological statistics. Topics include the nature of data, effective data presentation, the relationship of samples to populations, probability, sampling theory, descriptive statistics, estimation, comparison of samples, power testing, randomization techniques and analysis of frequencies. Students should combine this course with BIO361H5 for a complete introduction to Biometrics. [26L, 13T]
- After:** An introduction to the basic principles and procedures of biological statistics. Topics include the nature of data, effective data presentation, the relationship of samples to populations, probability, sampling theory, descriptive statistics, estimation, comparison of samples, power testing, randomization techniques and analysis of frequencies. Students should combine this course with BIO361H5 for a complete introduction to Biometrics. [26L, 26T]
- Rationale:** Tutorial hours amended to reflect time needed to cover course material.
-

Course #2 BIO361H5 Biometrics II

- Before:** A sequel to BIO360H5 in which topics in biological statistics are presented at an advanced level. Regression, concepts of power, analyses of variance, analysis of covariance, non-parametric techniques, and computer-intensive approaches are included. Students are required to complete an independent project involving experimental design, and collection and analysis of data. [26L, 36T]
- After:** A sequel to BIO360H5 in which topics in biological statistics are presented at an advanced level. Regression, concepts of power, analyses of variance, analysis of covariance, non-parametric techniques, and computer-intensive approaches are included. [26L, 36T]
- Rationale:** New description gives a more accurate summary of course content.
-

Course #3 CSC108H5 Introduction to Computer Programming

- Before:** Fundamental programming concepts of an object-oriented language such as Java. Program structure in an object-oriented language: classes, objects, methods, fields. Internal structure of methods: elementary data types, statements, control flow. Arrays; searching, sorting and complexity. Structure of computers; the computing environment. Practical sections consist of supervised work in the computing laboratory, and attendance is required. [39L, 12P, 13T]
- After:** Structure of computers; the computing environment. Programming in a language such as Python. Program structure: elementary data types, statements, control flow, functions, classes, objects, methods, fields. Lists; searching, sorting and complexity. Practical (P) sections consist of supervised work in the computing laboratory. These sections are offered when facilities are available, and attendance is required.
- Rationale:** First-year CSC courses will be switching from Java to Python as the instructional language.
-

Course #4 CSC148H5 Introduction to Computer Science

- Before:** Abstract data types and data structures for implementing them. Linked data structures. Encapsulation and information-hiding. Object-oriented programming in a language such as Java. Specifications. Analyzing the correctness and efficiency of algorithms and programs using mathematical reasoning. Recursion. Recurrence relations for analyzing the efficiency of recursive code. This course assumes oriented language such as C++ or Java, as provided by CSC108H5. Practical (P) sections consist of supervised work in the computing laboratory. These sections are offered when facilities are available, and attendance is required. [26L, 12P, 13T]
- After:** Abstract data types and data structures for implementing them. Linked data structures. Encapsulation and information-hiding. Object-oriented programming. Specifications. Analyzing the efficiency of programs. Recursion. This course assumes programming experience in a language such as Python, C++, or Java, as provided by CSC108H1. Students who already have this background may consult the Computer Science Undergraduate Office for advice about skipping CSC108H1. Practical (P) sections consist of supervised work in the computing laboratory. These sections are offered when facilities are available, and attendance is required.
- Rationale:** First-year CSC courses will be switching from Java to Python as the instructional language.
-

Course #5 CSC207H5 Software Design

- Before:** An introduction to software design and development concepts, methods, and tools. We will use either a current tool or a fundamental tool to illustrate each of the following development concepts: version control, unit testing, build management, debugging, refactoring and regular expressions. Other core topics include: maps or dictionaries, Python reflection and

configuration. [26L, 13T]

After: An introduction to software design and development concepts, methods, and tools using a statically-typed object-oriented programming language such as Java. Topics from: version control, build management, unit testing, refactoring, design patterns, advanced IDE usage, regular expressions, markup languages, parsing using finite state machines, and reflection.

Rationale: First-year CSC will now use Python (previously it was in 207H5) and this second-year course will now use Java.

Course #6 CSC338H5 Numerical Methods

Before: The study of computational methods for solving problems in linear algebra, non-linear equations, approximation, integration, and ordinary differential equations. The aim is to give students a basic understanding of both floating-point arithmetic and the methods used to solve numerical problems as well as a familiarity with the types of subroutines found in typical software packages. [26L, 13T]

After: The study of numerical methods for solving problems in linear algebra, non-linear equations, approximation, integration, and ordinary differential equations. The aim is to give students a basic understanding of both floating-point arithmetic and the methods used to solve numerical problems as well as a familiarity with the types of subroutines found in typical software packages. [26L, 13T]

Rationale: The course name was changed from "Computational Methods" to "Numerical Methods" (and the description was changed correspondingly) because "Computational" is just far too broad since it includes all of computer science, according to the course instructor.

Course #7 ERS315H5 Environmental Geology

Before: This course will focus on Earth processes as they relate to human activities. Topics include global climate change on short and long timescales; groundwater flow and contamination; human engineering of Earth processes; geological aspects of pollution and waste disposal; and impact of extracting/using minerals, energy, soil, and other Earth resources. A series of local field studies to demonstrate specific aspects of human-planet interaction will supplement the lecture/tutorial sessions. [26L, 13T]

After: This course will focus on Earth processes as they relate to human activities. Topics include global climate change on short and long timescales; groundwater flow and contamination/human engineering of Earth processes; geological aspects of pollution and waste disposal; and environmental impact of extracting/using minerals, energy, soil, and other Earth resources. A field trip will give students a first-hand experience in aspects of human/planet interaction. [39L]

Rationale: Course content modified to take into account interest and expertise of new faculty member.

Course #8 FSC239Y5 (1) Introduction to Forensic Science

Before:

After: Priority given to Forensic Science Specialists and Majors.

Rationale: DELETED ---Prerequisites: OAC Chemistry/Grade 12 Chemistry (SCH4U); OAC Calculus & OAC AG/Grade 12 Advanced Functions and Introductory Calculus (MCB4U); OAC Biology/Grade 12 Biology (SBI4U)

We are reverting back to original prerequisites previously listed for this course, of which there were none for this course. This change is due to deletion of the proposed new FSC courses from curriculum (those comprising proposed new FSC Minor program --which has now also been deleted from curriculum).

Course #9 GGR217H5 The Global Water Cycle

Before: The presence of water on and in the continents, atmosphere and oceans, sustains the Earth's climate, biosphere and life itself. This course takes a systems approach to the movement and storage of water on and in the Earth. Based on the framework of the global water cycle, the stores and transfers of water and energy in the Earth system are investigated from a scientific perspective. Emphases are on the physical processes that control these transfers (e.g. short and longwave energy balances, evaporation, surface and subsurface flow of water). [26L, 13P]

After: (former course name: Hydrosphere Dynamics) The presence of water on and in the continents, atmosphere and oceans, sustains the Earth's climate, biosphere and life itself. This course takes a systems approach to the movement and storage of water on and in the Earth. Based on the framework of the global water cycle, the stores and transfers of water and energy in the Earth system are investigated from a scientific perspective. Emphases are on the physical processes that control these transfers (e.g. short and longwave energy balances, evaporation, surface and subsurface flow of water). [26L, 13P]

Rationale: Change of course name better communicates course theme to students.

Course #10 GGR227H5 Ecosystems and Environmental Change

- Before:** A scientific system approach is taken to the study of various subfields of physical geography. Topics in geomorphology, pedology, and biogeography will be stressed. Climatology, hydrology, and glaciology are integrated into the concept of biomes and human influences on the biosphere. Use of analytical tools such as geographic information systems. [26L, 13P]
- After:** (Formerly Ecosystem Geography) This course introduces the rapidly advancing fields of ecosystem science through the exploration of how ecosystems respond to climate change, pollution, and intensive natural resource management. The impacts from human origin stressors on ecosystem functioning are often complex, with interactions occurring among plants, microorganisms, and physical and chemical environments. Empirical and modeling approaches are explored as they allow us to understand and predict ecosystem functioning and the linkages and feedbacks with changing environments. Lecture topics and case studies focus primarily on important representative Canadian ecosystems that also play vital roles in the resource sector including forests, agricultural land, wetlands and aquatic ecosystems. [26L , 13P]
- Rationale:** The change of course title and description reflects a better description of the course content and matches the expertise of a faculty member recently hired to make teaching and research contributions in this area.
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Course #11 GGR276H5 Spatial Data Analysis and Mapping

- Before:** (Formerly Geographic Information Processing and Mapping) Fundamentals of relational database and geodatabase design and management to support environmental modelling and the policy making process. Geographic data processing in socio-economic and scientific research. Assessment of statistical software reliability. Practical foundations for understanding networking and privacy in a computerized society. [26L, 13P]
- After:** (Formerly Geographic Information Processing and Mapping) Introduction to the study of geographical phenomena using descriptive and inferential statistics. Fundamentals of geographic data and statistical problem solving using non-spatial and spatial descriptive statistics. Decision making using evidence gathered from inferential statistical analysis. Graphical summary, geographic visualization and mapping of analytical results. Application of state of the art software for statistical analysis. Provides background for future studies in geographic information systems and advanced statistical analysis. The course strikes a balance between developing an understanding of core non-spatial and spatial statistical concepts, while demonstrating technical proficiency in the application of software to the study of geographical questions. [23L, 13P]
- Rationale:** The change in course description reflects the course content delivered over the last 2 years. Moreover, the description demonstrates continuity with departmental curricula focused on geographic information systems (GIS) and spatial analysis.
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Course #12 GGR307H5 Environmental Soil Sciences

- Before:** Application of soil geography to problems of resource use and management. Soil erosion processes and conservation techniques. Soil water management. Drainage and reclamation of wetland soils. Soil pollution issues. Soil capability classification. Selected problems of soils in arid and semi-arid regions, the humid tropics, as well as the Arctic and sub-Arctic. [26L, 13P]
- After:** (Formerly Soil Management) Soils play critical roles in sustaining life. They support plants and agriculture, serve as home to a plethora of organisms, recycle organic matter and nutrients, provide materials for construction, art, and medicine, preserve paleoecological and archaeological records, regulate global climate through the exchange of greenhouse gasses, and filter contaminants in water and waste. This course introduces fundamentals of soil formation, physical, chemical and biological characteristics, and classification schemes. It explores the role of, and how humans interact with, soils in Canadian forests, wetlands, agricultural systems, and industrial and urban settings. Aspects of carbon, nutrient, and pollutant biogeochemistry in soils are explored in detail. There is one full-day field trip to a nearby forest, wetland and farm and subsequent laboratory exercises. [26L, 13P]
- Rationale:** The change of course title and description reflects a better description of the course content and matches the expertise of a faculty member recently hired to make teaching and research contributions in this area.
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Course #13 GGR309H5 Wetlands: Science, Management and Preservation

- Before:**
- After:** This course is offered in even-number years, alternating with GGR315H5.
- Rationale:** adjusting department course offerings
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Course #14 GGR315H5 Physical Hydrology

- Before:**
- After:** This course is offered in odd-number years, alternating with GGR309H5.

Rationale: adjusting department course offerings

Course #15 MAT202H5 Introduction to Abstraction

Before: *Coming soon!*

After: Mathematics derives its great power from its ability to formulate abstract concepts and techniques. In this course, students will be introduced to abstraction and its power, mainly through a study of topics from abstract algebra. Groups, rings, and fields will be introduced. The course will emphasize active participation of the students in discussion and written assignments.

Rationale: This course received late approval at the campus level last summer. A description is now being added.

Course #16 PHY332H5 Molecular Biophysics

Before: Quantum mechanical and thermodynamic description of biopolymers and biological structures. Topics include: properties of biomolecules: chemical bonds, cooperative transitions, and properties of single macromolecules; biophysics of proteins: protein folding, enzymes as molecular machines, stepping biomotors, and structural proteins; biophysics of nucleic acids: mechanical and electric properties of DNA, DNA melting; molecular machines in membranes: chemiosmotic energy transduction, ion pumping, motor proteins, action potential. [26L, 13T]

After: A physicist's perspective on the building blocks of the living world, such as nucleic acids, proteins and lipids. The course will cover topics such as symmetry, structural complexity of the biological macromolecules, molecular interactions in the cellular environment and the impact for the biological function. Basic concepts from mechanics and thermodynamics will be applied specifically to proteins and DNA in order to understand structural transitions, stabilizing interactions, reaction dynamics and equilibrium. A rigorous treatment of a wide range of biophysical techniques commonly use in life science, such as optical spectroscopy, light scattering, mass spectrometry and single-molecule methods, will be accompanied by recent examples from the molecular biophysics research. [26L, 13T]

Rationale: Changes in prerequisites to harmonize course with others in the new Biological Physics Specialist program.

Course #17 STA258H5 Statistics with Applied Probability

Before: (Replaces STA248H.) A survey of statistical methodology with emphasis on the relationship between data analysis and probability theory. Topics covered include descriptive statistics, propagation of error, limit theorems, hypothesis tests, confidence intervals, linear regression, analysis of variance, count data. A statistical computer package will be used. [39L, 13T]

After: (Replaces STA248H.) A survey of statistical methodology with emphasis on the relationship between data analysis and probability theory. Topics covered include descriptive statistics, limit theorems, sampling distribution, point and interval estimation both classical and bootstrap, hypothesis testing both classical and bootstrap, permutation tests, contingency tables and count data. A statistical computer package will be used. [39L, 13T]

Rationale: updated course content

Course #18 STA413H5 Estimation and Testing

Before: Theory of statistical estimation and hypothesis testing. This course emphasizes abstraction and rigour. [26L, 13T]

After: This course replaces STA412H5. Theory of statistical estimation and hypothesis testing. This course emphasizes abstraction and rigour. [26L, 13T]

Rationale: The course number is being changed from STA412H so as not to cause confusion with a similarly numbered course at St. George which has different content.

Changes in Course Name

Course #1 CSC338H5 Numerical Methods

Before: Computational Methods

After: Numerical Methods

Rationale: The course name was changed from "Computational Methods" to "Numerical Methods" (and the description was changed correspondingly) because "Computational" is just far too broad since it includes all of computer science, according to the course instructor.

Course #2 GGR217H5 The Global Water Cycle

Before: Hydrosphere Dynamics

After: The Global Water Cycle

Rationale: Change of course name better communicates course theme to students.

Course #3 GGR227H5 Ecosystems and Environmental Change

Before: Ecosystem Geography

After: Ecosystems and Environmental Change

Rationale: The change of course title and description reflects a better description of the course content and matches the expertise of a faculty member recently hired to make teaching and research contributions in this area.

Course #4 GGR307H5 Environmental Soil Sciences

Before: Soil Management

After: Environmental Soil Sciences

Rationale: The change of course title and description reflects a better description of the course content and matches the expertise of a faculty member recently hired to make teaching and research contributions in this area.

Courses - Other Changes

Course #1 ACT244H5 Fundamental Principles of Actuarial Science

Before: Prerequisite: STA257H5/ECO227Y5; MAT132Y5/137Y5/138Y5/232H5

After: Prerequisite: STA257H5/ECO227Y5; MAT132Y5/137Y5/138Y5

Rationale: Changes have been made to ACT245H1, these changes reflect changes in the Society of Actuary qualification process. ACT245H5 has not incorporated these changes since there are no actuaries at UTM, there is no actuarial science program at UTM, only a couple of UTM students have ever been successful in their application to the St George Act Sci program (which requires MAT137 with a mark of at least 70%) . Since ACT245H5 is no longer equivalent to ACT245H1, it has been renumbered as ACT244H5.

Course #2 ECO220Y5 Quantitative Methods in Economics

Before: Prerequisite: ECO100Y5 (63%/CGPA 2.50); MAT132Y5/MAT132Y5/133Y5/134Y5/135Y5/137Y5/138Y5

After: Prerequisite: ECO100Y5 (67%), or ECO100Y5 (63%) and aCGPA 2.50; MAT132Y5/133Y5/134Y5/135Y5/137Y5/138Y5

Rationale: To improve the academic quality of students and ensure the successful completion of an Economics Program.

Course #3 ERS315H5 Environmental Geology

Before: Prerequisite: ERS202H5/203H5

Course Exclusion: ERS215H5

After: Prerequisite: **Two of:** ERS201H5, 202H5, 203H5

Course Exclusion:

Rationale: Course content modified to take into account interest and expertise of new faculty member.

Course #4 GGR227H5 Ecosystems and Environmental Change

Before: Prerequisite: GGR117Y5/ENV100Y5/4.0 credits

Course Exclusion: GGR217Y5

After: Prerequisite: GGR117Y5/ENV100Y5/4.0 credits/P.I.

Course Exclusion:

Rationale: The change of course title and description reflects a better description of the course content and matches the expertise of a faculty member recently hired to make teaching and research contributions in this area.

Course #5 GGR276H5 Spatial Data Analysis and Mapping

Before: Prerequisite: GGR117Y5/ENV100Y5/4.0 credits

After: Prerequisite: 1.0 FCE from GGR117Y or ENV100Y or 4.0 Credits

Rationale: The change in course description reflects the course content delivered over the last 2 years. Moreover, the description demonstrates continuity with departmental curricula focused on geographic information systems (GIS) and spatial analysis.

Course #6 GGR307H5 Environmental Soil Sciences

Before: Prerequisite: GGR214H5/217H5, 227H5

After: Prerequisite: 8.0 credits complete in GGR, ENV, ANT, BIO and any science course with a laboratory component or P.I.

Rationale: The change of course title and description reflects a better description of the course content and matches the expertise of a faculty member recently hired to make teaching and research contributions in this area.

Course #7 GGR311H5 Landscape Biogeography

Before: Prerequisite: GGR227H5/GGR305H5/BIO205H5/P.I.

After: Prerequisite: GGR305H5/BIO205H5/P.I.

Rationale: GGR227 will be taught by a new faculty with new title and course content with no GIS component.

Course #8 GGR417Y5 Honours Thesis

Before: Prerequisite: Completion of 3rd year requirements for the Specialist program in GGR.
After: Prerequisite: Completion of 3rd year requirements for the Specialist program in GGR Arts and Science.
Rationale: This reflects the core requirement of Specialist program in GGR Arts or Science.

Course #9 MAT137Y5 Calculus

Before: Course Exclusion: MAT132Y5, 133Y5, 134Y5, 135Y5, 137Y5/138Y5
After: Course Exclusion: MAT132Y5, 133Y5, 134Y5, 135Y5, 138Y5
Rationale: Typographical error in exclusions corrected

Course #10 MAT232H5 Calculus of Several Variables

Before: Course Exclusion: MAT137Y5/138Y5
After: Course Exclusion: MAT138Y5
Rationale: MAT137Y, previously listed as an exclusion, should not be an exclusion since it does not contain multivariable calculus

Course #11 MAT242H5 Differential Equations I

Before: Prerequisite: MAT137Y5/138Y5 OR Corequisite MAT232H5
Corequisite: MAT232H5 OR Prerequisite MAT137Y5/138Y5
After: Prerequisite: MAT138Y5 OR Corequisite MAT232H5
Corequisite: MAT232H5 OR Prerequisite MAT138Y5
Rationale: Minor correction of prerequisites

Course #12 MAT311H5 Partial Differential Equations

Before: Prerequisite: MAT102H5, 137Y5/138Y5/232H5, 242H5/258Y5
After: Prerequisite: MAT102H5, 138Y5/232H5, 242H5/258Y5
Rationale: slight modification of prerequisites to ensure students have had multivariable calculus

Course #13 MAT332H5 Introduction to Nonlinear Dynamics and Chaos

Before: Prerequisite: MAT137Y5/138Y5/232H5, MAT(223H5, 224H5)/248H5, MAT242H5/258Y5
After: Prerequisite: MAT138Y5/232H5, MAT(223H5, 224H5)/248H5, MAT242H5/258Y5
Rationale: slight modification of prerequisites to ensure students have had multivariable calculus

Course #14 MAT334H5 Complex Variables

Before: Prerequisite: MAT102H5, 137Y5/138Y5/232H5
After: Prerequisite: MAT102H5, 138Y5/232H5
Rationale: slight modification of prerequisites to ensure students have had multivariable calculus.

Course #15 MAT368H5 Vector Calculus

Before: Prerequisite: MAT102H5, 137Y5/138Y5/232H5
After: Prerequisite: MAT102H5, 138Y5/232H5
Rationale: slight modification of prerequisites to ensure that students have had

some multivariable calculus

Course #16 PHY331H5 Foundations of Biophysics

Before: Prerequisite: PHY241H5/245H5, PHY242H5/CHM221H5, MAT212H5/242H5, 232H5
Corequisite: JCP321H5

After: Prerequisite: PHY241H5/245H5, PHY242H5/CHM221H5
Corequisite:

Rationale: Changes in pre- and co-requisites to harmonize course with others in the new Biological Physics Specialist program.

Course #17 PHY332H5 Molecular Biophysics

Before: Prerequisite: PHY241H5, 242H5, 245H5, 331H5, MAT212H5/242H5, 232H5, 252H5, 311H5, CHM221H5, JCP321H5
Corequisite: MAT332H5, JCP322H5
Recommended Preparation:

After: Prerequisite: PHY241H5, 242H5/CHM221H5, MAT212H5/242H5
Corequisite:
Recommended Preparation: PHY331H5, JCP321H5

Rationale: Changes in prerequisites to harmonize course with others in the new Biological Physics Specialist program.

Course #18 PSY354H5 The Biopsychology of Sex

Before: Course Exclusion: ANT331H5, NEW261Y1

After: Course Exclusion:

Rationale: Error correction
