

New Course

Proposal Reference Number : 9308

PRN Alias : 14-15#531

Version No : 6

Submitted By : Dr Amy Blum

Edited By : Ms Josie D'Amico

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New Data							
Program Affected?	Y						
Program Change Form Submitted?	N (Simple Change) - As a Required course, please replace CHEM 253 and CHEM 263 with CHEM 283 for Major in Chemistry, Honours in Chemistry, Major in Chemistry with Bio-Organic option, Honours in Chemistry with Bio-Organic option, Major in Chemistry with Materials option, Honours in Chemistry with Materials option, Major in Chemistry with Atmosphere and Environment option (Program Revision Forms submitted for the above programs); Honours in Chemistry with Atmosphere and Environment option.						
Subject/Course/Term	CHEM 283 <ul style="list-style-type: none"> • one term 						
Credit Weight or CEU's	2 credits						
Course Activities	<table border="1"> <thead> <tr> <th>Schedule Type</th> <th>Hours per week</th> </tr> </thead> <tbody> <tr> <td>L - Laboratory</td> <td>4</td> </tr> <tr> <td>T - Tutorial</td> <td>1</td> </tr> </tbody> </table>	Schedule Type	Hours per week	L - Laboratory	4	T - Tutorial	1
	Schedule Type	Hours per week					
	L - Laboratory	4					
	T - Tutorial	1					
Total Hours per Week : 5							
Total Number of Weeks : 13							
Course Title	<table border="1"> <tbody> <tr> <td>Official Course Title :</td> <td>Intro Phys Chem Lab</td> </tr> <tr> <td>Course Title in Calendar :</td> <td>Introductory Physical Chemistry Laboratory</td> </tr> </tbody> </table>	Official Course Title :	Intro Phys Chem Lab	Course Title in Calendar :	Introductory Physical Chemistry Laboratory		
	Official Course Title :	Intro Phys Chem Lab					
Course Title in Calendar :	Introductory Physical Chemistry Laboratory						
Rationale	Currently, Chemistry has two 1-credit U1 level physical chemistry lab courses (CHEM 253, CHEM 263). We would like to combine these courses into one 2-credit lab that runs both semesters to keep class size manageable. This will give our students more flexibility in scheduling, since they will not have one U1 semester with three afternoon labs to schedule. With the increased credit weight, we will also be able to introduce more sophisticated data analysis methods, with tutorials available online to maintain scheduling flexibility. In addition, the course will enable students to be in the lab every week instead of every other week for one hour longer per week. This will allow more complex, multi-session labs and give the students a						

	better experience in the course. 253 will be retained for education majors and chemistry minors. It will be a subset of the new course (as is done with the nurses for organic chemistry lab). We will run 263 as a subset of the new course for a year to make sure all Chemistry majors who took CHEM 253 can finish out, then retire it.
Responsible Instructor	
Course Description	An introduction to experiments and data analysis in physical chemistry.
Teaching Dept.	0287 : Chemistry
Administering Faculty/Unit	SC : Faculty of Science
Prerequisites	CHEM 110, CHEM 120 or equivalent Web Registration Blocked? : N
Corequisites	CHEM 223 or CHEM 243 Web Registration Blocked? : N
Restrictions	Not open to students who are taking or have taken CHEM 253 or CHEM 263.
Supplementary Calendar Info	1. This course should be taken with either CHEM 223 or CHEM 243.
Additional Course Charges	
Campus	Downtown
Projected Enrollment	40
Requires Resources Not Currently Available	N
Explanation for Required Resources	
Required Text/Resources Sent To Library?	
Library Consulted About Availability of Resources?	
Consultation Reports Attached?	
Effective Term of Implementation	201509
File Attachments	<ul style="list-style-type: none"> • chem283.pdf View
To be completed by the Faculty	
For Continuing Studies Use	

Approvals Summary

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Version No.	Departmental Curriculum Committee	Departmental Meeting	Departmental Chair	Other Faculty	Curric/Academic Committee	Faculty	SCTP	Version Status
6								Approved by Departmental Chair Edited by: Josie D'Amico on: Nov 21 2014
5								Approved by Departmental Chair Edited by: Amy Blum on: Nov 21 2014
4								Approved by Departmental Chair Edited by: Amy Blum on: Nov 21 2014
3								Approved by Departmental Chair Edited by: Josie D'Amico on: Nov 20 2014
2			Approved Masad J Damha Meeting Date: Nov 13 2014 Approval Date: Nov 14 2014 View Comments					Approved by Departmental Chair Edited by: Amy Blum on: Nov 14 2014
1								Submitted to Department Chair for approval Created on: Nov 14 2014

CHEM 283

Introductory Physical Chemistry Laboratory

Summary and Overview: CHEM 283 will be an opportunity for new Chemistry Students to learn basic measurement techniques and how to write lab reports. A major portion of the course will involve the design, synthesis, and physical characterization of a biodiesel fuel. This experiment will enable students to research a laboratory procedure, carry it out, and characterize the results.

Practical Lab Skills Goals: Students will assemble a simple apparatus individually, collect data manually, and analyze results into simple yet meaningful conclusions using spreadsheets and graphing software in as much of a 'hands-on' fashion as possible. This lab will stress simplicity of concept over complexity of instrumentation, and parallel as much real research in materials and methods as possible.

Relationship to Lectures: CHEM 223/243 are not prerequisite for this course, although most students will be taking one of these classes concurrently. Although the material covered in lab will also be covered in CHEM 223/243, a variety of practical reasons make synchronization between the two difficult. Thus, the labs will be prepared to act as standalone units based on knowledge from General Chemistry and information in the online lab manual.

Relationship to Other Laboratory Courses: Students will be expected to take the introductory Organic Chemistry Laboratory either concurrently or soon after, which will provide them with basic glassware and dry/wet chemical handling techniques, so these skills will not be stressed in CHEM 283. Similarly, the advanced Physical Chemistry laboratory will provide a good opportunity for all students later to get introduced to advanced and complex equipment, so this is also not a primary goal of CHEM 283. On the other hand, the analytical labs in later years and the advanced Physical Chemistry laboratory require students to write reports and use error analysis, so one of the goals of CHEM 283 is to give students some basic skills in this area.

Curriculum Guidelines: This is a 2-credit laboratory course of 3 hours laboratory time per week, running each term for 13 weeks. Lab reports will be due two weeks after the laboratory session. Reports should be submitted at the start of the laboratory session. Reports received after this time will be considered late. Students have 2 weeks to prepare their lab reports after completing the experiment. PLEASE do not wait until the last minute to write up your reports! There is no grace period for late work, which will be docked 10 points per day.

It should be remembered that the reports are analogous to examinations and copying from the reports of other students is a serious offense. Similarly plagiarism, i.e., copying substantial sections from notes or references and presenting these without referring to the source so that it pretends to be original work, is highly unethical.

Appropriate procedures, outlined in the "Code of Student Conduct and Disciplinary Procedures", will be instituted, if the occasion warrants. "McGill University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures (see www.mcgill.ca/integrity for more information)."

CHEM - 283
INTRODUCTORY PHYSICAL CHEMISTRY LABORATORY

SCHEDULE – FALL 2015

Week	Schedule
1	Room 113 Introductory Meeting.
2	Library & Safety. Library assignment
3	Borate Equilibrium
4	Carbonic Acid Kinetics
5	Liquid-Liquid Equilibrium
6	Photochemistry
7	Biodiesel 1
8	Biodiesel 2
9	Biodiesel 3
10	Biodiesel 4
11	Something Computational TBD
12	Clock Reaction
13	Electrochemistry

Grading:

2 assignments (library, computational)	15%
6 standard lab reports	50%
1 double weight lab report (biodiesel)	20%
Prelab quiz	10%
Labwork	5%

The lowest scored standard lab report will be dropped.

Revision for CHEM 345

Proposal Reference Number : 9259
 PRN Alias : 14-15#482
 Version No : 2
 Submitted By : Dr Amy Blum
 Edited By : Ms Josie D'Amico

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Summary of Changes **Course Title, Prerequisites**

	Current Data	New Data		
Program Affected?		N		
Program Change Form Submitted?				
Subject/Course/Term	CHEM 345 <ul style="list-style-type: none"> one term 			
Credit Weight or CEU's	3 credits.			
Course Activities	<ul style="list-style-type: none"> A - Lecture T - Tutorial 			
Course Title	Course Title on Transcript	Molec Props & Structure 1		
	Course Title on Calendar	Molecular Properties and Structure 1.		
	Course Title on Transcript	Intro to Quantum Chem		
	Course Title on Calendar	Introduction to Quantum Chemistry		
Rationale		We are changing the course title to better describe the content. We are also removing MATH 315 as a prerequisite.		
Responsible Instructor				
Course Description	An introduction to quantum chemistry covering the historical development, wave theory, methods of quantum mechanics, and applications of quantum chemistry.			
Teaching Dept.	0287 : Chemistry			
Administering Faculty/Unit	SC : Faculty of Science			
Prerequisites	Prerequisites: CHEM 213 or CHEM 223 and CHEM 243, MATH 315, and PHYS 142, or permission of instructor.	Prerequisites: CHEM 213 or CHEM 223 and CHEM 243, and PHYS 142, or permission of instructor. <table border="1"> <tr> <td>Web Registration Blocked? :</td> <td>Y</td> </tr> </table>	Web Registration Blocked? :	Y
Web Registration Blocked? :	Y			

		Minimum Grade or Test Scores :	C
		Prereq course or test taken at the same time? :	N
Corequisites			
Restrictions	<ul style="list-style-type: none"> Restriction: For Chemistry Honours and Majors only 		
Supplementary Calendar Info	1. Fall		
Additional Course Charges			
Campus			
Projected Enrollment			
Requires Resources Not Currently Available			
Explanation for Required Resources			
Consultation Reports Attached?			
Effective Term of Implementation		201509	
File Attachments		No attachments have been saved yet.	
To be completed by the Faculty			
For Continuing Studies Use			

Approvals Summary

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Version No.	Departmental Curriculum Committee	Departmental Meeting	Departmental Chair	Other Faculty	Curric/Academic Committee	Faculty	SCTP	Version Status
2								Submitted to Curriculum/Academic Committee for approval Edited by: Josie D'Amico on: Nov 19 2014
1								Submitted to Curriculum/Academic Committee for approval Created on: Nov 7 2014

Revision for CHEM 355

Proposal Reference Number : 9260
 PRN Alias : 14-15#483
 Version No : 2
 Submitted By : Dr Amy Blum
 Edited By : Ms Josie D'Amico

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Summary of Changes **Course Title, Course Description**

	Current Data	New Data				
Program Affected?		N				
Program Change Form Submitted?						
Subject/Course/Term	CHEM 355 <ul style="list-style-type: none"> • one term 					
Credit Weight or CEU's	3 credits.					
Course Activities	<ul style="list-style-type: none"> • A - Lecture • T - Tutorial 					
Course Title	Course Title on Transcript	Molecular Props. & Structure 2				
	Course Title on Calendar	Molecular Properties and Structure 2.				
		<table border="1"> <tr> <td>Course Title on Transcript</td> <td>Appl of Quantum Chemistry</td> </tr> <tr> <td>Course Title on Calendar</td> <td>Applications of Quantum Chemistry</td> </tr> </table>	Course Title on Transcript	Appl of Quantum Chemistry	Course Title on Calendar	Applications of Quantum Chemistry
Course Title on Transcript	Appl of Quantum Chemistry					
Course Title on Calendar	Applications of Quantum Chemistry					
Rationale		The new course title and description will more accurately describe the material in the course.				
Responsible Instructor						
Course Description	A survey of the principles of electronic, vibrational and rotational spectroscopy. Magnetic resonance methods.	A survey of the principles of electronic, vibrational and rotational spectroscopy. Magnetic resonance and computational methods.				
Teaching Dept.	0287 : Chemistry					
Administering Faculty/Unit	SC : Faculty of Science					
Prerequisites	Prerequisite: CHEM 345, PHYS 242, or permission of instructor					
Corequisites						
Restrictions						

Supplementary Calendar Info	1. Winter	
Additional Course Charges		
Campus		
Projected Enrollment		
Requires Resources Not Currently Available		
Explanation for Required Resources		
Consultation Reports Attached?		
Effective Term of Implementation		201601
File Attachments		No attachments have been saved yet.
To be completed by the Faculty		
For Continuing Studies Use		

Approvals Summary

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Version No.	Departmental Curriculum Committee	Departmental Meeting	Departmental Chair	Other Faculty	Curric/Academic Committee	Faculty	SCTP	Version Status
2								Submitted to Curriculum/Academic Committee for approval Edited by: Josie D'Amico on: Nov 19 2014
1								Submitted to Curriculum/Academic Committee for approval Created on: Nov 7 2014

Course Number Change for CHEM 382

Proposal Reference Number : 9264
 PRN Alias : 14-15#487
 Version No : 3
 Submitted By : Dr Amy Blum
 Edited By : Ms Josie D'Amico

[Display Printable PDF](#)

Summary of Changes **Subject/Course/Term, Prerequisites, Restrictions**

	Current Data	New Data				
Program Affected?		Y				
Program Change Form Submitted?		N (Simple Change) - Please replace CHEM 382 CHEM 482 in the list of Complementary courses for the following programs: Bachelor of Arts and Science (B.A. & Sc.) - Major Concentration Chemistry (36 credits); Bachelor of Engineering (B.Eng.) - Minor Biotechnology (for Engineering Students) (24 credits) Bachelor of Engineering (B.Eng.) - Minor Chemistry (25 credits); Bachelor of Science (B.Sc.) - Honours Biochemistry (76 credits); Bachelor of Science (B.Sc.) - Honours Pharmacology (74 credits); Bachelor of Science (B.Sc.) - Liberal Program - Core Science Component Chemistry - Biological (47 credits); Bachelor of Science (B.Sc.) - Major Biochemistry (67 credits); Bachelor of Science (B.Sc.) - Major Pharmacology (65 credits); Bachelor of Science (B.Sc.) - Minor Biotechnology (for Science Students) (24 credits); Concurrent Bachelor of Science (B.Sc.) and Bachelor of Education (B.Ed.) - Major Concentration Chemistry with Minor Biology for Teachers (135 credits); Concurrent Bachelor of Science (B.Sc.) and Bachelor of Education (B.Ed.) - Major Concentration Chemistry with Minor Physics for Teachers (135 credits).				
Subject/Course/Term	CHEM 382 <ul style="list-style-type: none"> one term 	CHEM 482 <ul style="list-style-type: none"> one term 				
Credit Weight or CEU's	3 credits.	3 credits				
Course Activities	<ul style="list-style-type: none"> A - Lecture 	<table border="1"> <thead> <tr> <th>Schedule Type</th> <th>Hours Per Week</th> </tr> </thead> <tbody> <tr> <td>A - Lecture</td> <td>3</td> </tr> </tbody> </table> <p>Total Hours per Week : 3 Total Number of Weeks : 13</p>	Schedule Type	Hours Per Week	A - Lecture	3
Schedule Type	Hours Per Week					
A - Lecture	3					
Course Title	<table border="1"> <tr> <td>Course Title on Transcript</td> <td>Organic Chem:Natural Products</td> </tr> </table>	Course Title on Transcript	Organic Chem:Natural Products	<table border="1"> <tr> <td>Course Title on Transcript</td> <td>Organic Chem:Natural Products</td> </tr> </table>	Course Title on Transcript	Organic Chem:Natural Products
Course Title on Transcript	Organic Chem:Natural Products					
Course Title on Transcript	Organic Chem:Natural Products					

	Course Title on Calendar	Organic Chemistry: Natural Products.	Course Title on Calendar	Organic Chemistry: Natural Products.
Rationale			This course is a 300 level course for historical reasons, although it has a 300 level prerequisite (CHEM 302). Raising the number of the course will bring the course number in line with the level of the material presented.	
Responsible Instructor				
Course Description	Structure, synthesis, stereochemistry and biosynthesis of terpenes, alkaloids, antibiotics and selected molecules of medicinal interest.		Structure, synthesis, stereochemistry and biosynthesis of terpenes, alkaloids, antibiotics and selected molecules of medicinal interest.	
Teaching Dept.	0287 : Chemistry		0287 : Chemistry	
Administering Faculty/Unit	SC : Faculty of Science		SC : Faculty of Science	
Prerequisites	Prerequisite/corequisite: CHEM 302		Prerequisite: CHEM 302	<input type="text" value="Web Registration Blocked? : N"/>
Corequisites				
Restrictions			Not open to students who are taking or have taken CHEM 382.	
Supplementary Calendar Info	1. Winter		1. Winter	
Additional Course Charges				
Campus			Downtown	
Projected Enrollment				
Requires Resources Not Currently Available			N	
Explanation for Required Resources				
Consultation Reports Attached?				
Effective Term of Implementation			201601	
File Attachments			No attachments have been saved yet.	
To be completed by the Faculty				

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Studies Use

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3								Approved by Departmental Chair Edited by: Josie D'Amico on: Nov 21 2014
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1			Approved Masad J Damha Meeting Date: Nov 13 2014 Approval Date: Nov 14 2014 View Comments					Approved by Departmental Chair Created on: Nov 14 2014



<p>1.0 Degree Title Specify the two degrees for concurrent degree programs</p> <p>1.1 <input style="width: 100%;" type="text" value="B.Sc."/></p> <p>1.2 Concentration (Legacy = Concentration/Option) If applicable (30 char. max.) <input style="width: 100%;" type="text" value="Major in Chemistry"/></p> <p>1.3 Minor (with Concentration, if applicable) (30 char. max.) <input style="width: 100%;" type="text"/></p> <p>1.4 Category</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"> Faculty Program (FP) x Major Joint Major Major Concentration (CON) Minor Minor Concentration (CON) </td> <td style="width: 50%; border: none;"> Honours (HON) Joint Honours Component (HC) Internship/Co-op Thesis (T) Non-Thesis (N) Other Please specify </td> </tr> </table> <p>1.5 <input style="width: 100%;" type="text" value="B. Sc. Major in Chemistry"/></p>	Faculty Program (FP) x Major Joint Major Major Concentration (CON) Minor Minor Concentration (CON)	Honours (HON) Joint Honours Component (HC) Internship/Co-op Thesis (T) Non-Thesis (N) Other Please specify	<p>2.0 Administering Faculty/Unit <input style="width: 100%;" type="text" value="Science/Chemistry"/></p> <p>Offering Faculty/Department</p> <p>3.0 Effective Term of revision or retirement Please give reasons in 5.0 "Rationale" in the case of retirement (Ex. Sept. 2004 = 200409) Retirement</p> <p>Term: 201509</p> <p>4.0 Existing Credit Weight Proposed Credit Weight</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"><input style="width: 100%;" type="text" value="59"/></td> <td style="width: 50%; border: none;"><input style="width: 100%;" type="text" value="59"/></td> </tr> </table> <p>5.0 Rationale for revised program</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Under Required courses, CHEM 283 replaces CHEM 253 and CHEM 263 in a credit-neutral change. We are changing MATH 315 from a required course to a complementary course. As a department, we decided that 3 credits of ordinary differential equations are not core to a degree in chemistry. This will enable us to return some flexibility to our programs that was removed by the addition of CHEM 332 as required to retain accreditation. An additional 3 credits of Complementary courses are being added to maintain the credit weight of the program.</p> <p style="text-align: right;"><input type="checkbox"/></p> </div>	<input style="width: 100%;" type="text" value="59"/>	<input style="width: 100%;" type="text" value="59"/>
Faculty Program (FP) x Major Joint Major Major Concentration (CON) Minor Minor Concentration (CON)	Honours (HON) Joint Honours Component (HC) Internship/Co-op Thesis (T) Non-Thesis (N) Other Please specify				
<input style="width: 100%;" type="text" value="59"/>	<input style="width: 100%;" type="text" value="59"/>				

6.0 Revised Program Description (Maximum 150 words)

<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
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7.0 List of existing program and proposed program

Existing program (list courses as follows: Subj Code/Crse Num, Title, Credit weight, under the headings of: Required Courses, Complementary Courses, Elective Courses)

Required Courses (56 credits)

The required courses in this program consist of 53 credits in chemistry, physics and mathematics, listed below. The courses marked with an asterisk (*) are omitted from the program of students who have successfully completed them at the CEGEP level but the Chemistry courses must be replaced by courses in that discipline if students wish to be eligible for admission to the Ordre des chimistes du Québec. Students from outside Quebec or transfer students should consult the Academic Adviser.

See <http://www.chemistry.mcgill.ca/advising/inside/advisors.php>.

A computer science course, either COMP 202 or COMP 208, is strongly recommended during U1 for students who have no previous introduction to computer programming. Students should contact their adviser on this matter. Completion of Mathematics MATH 222 and MATH 315 during U1 is also strongly recommended. Physics PHYS 242 should be completed during U2.

* Denotes courses with CEGEP equivalents.

** Students who have successfully completed MATH 150 and MATH 151 are not required to take MATH 222.

CHEM 212 Introductory Organic Chemistry 1 (4 credits) *
CHEM 222 Introductory Organic Chemistry 2 (4 credits) *
CHEM 223 Introductory Physical Chemistry 1 (2 credits)
CHEM 243 Introductory Physical Chemistry 2 (2 credits)
CHEM 253 Introductory Physical Chemistry 1 Laboratory (1 credit)
CHEM 263 Introductory Physical Chemistry 2 Laboratory (1 credit)
CHEM 281 Inorganic Chemistry 1 (3 credits)
CHEM 287 Introductory Analytical Chemistry (2 credits)
CHEM 297 Introductory Analytical Chemistry Laboratory (1 credit)
CHEM 302 Introductory Organic Chemistry 3 (3 credits)
CHEM 332 Biological Chemistry (3 credits)
CHEM 345 Molecular Properties and Structure 1 (3 credits)
CHEM 355 Molecular Properties and Structure 2 (3 credits)
CHEM 365 Statistical Thermodynamics (2 credits)
CHEM 367 Instrumental Analysis 1 (3 credits)
CHEM 377 Instrumental Analysis 2 (3 credits)
CHEM 381 Inorganic Chemistry 2 (3 credits)
CHEM 392 Integrated Inorganic/Organic Laboratory (3 credits)
CHEM 493 Advanced Physical Chemistry Laboratory (2 credits)
MATH 222 Calculus 3 (3 credits) **
MATH 315 Ordinary Differential Equations (3 credits)
PHYS 242 Electricity and Magnetism (2 credits)

Complementary Courses (3 credits)

3 credits of additional Chemistry (CHEM) courses at the 300 level or higher

Proposed program (list courses as follows: Subj Code/Crse Num, Title, Credit weight, under the headings of: Required Courses, Complementary Courses, Elective Courses)

Required Courses (53 credits)

The required courses in this program consist of 53 credits in chemistry, physics and mathematics, listed below. The courses marked with an asterisk (*) are omitted from the program of students who have successfully completed them at the CEGEP level but the Chemistry courses must be replaced by courses in that discipline if students wish to be eligible for admission to the Ordre des chimistes du Québec. Students from outside Quebec or transfer students should consult the Academic Adviser.

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CHEM 222 Introductory Organic Chemistry 2 (4 credits) *
CHEM 223 Introductory Physical Chemistry 1 (2 credits)
CHEM 243 Introductory Physical Chemistry 2 (2 credits)
CHEM 283 Introductory Physical Chemistry Laboratory (2 credits)
CHEM 281 Inorganic Chemistry 1 (3 credits)
CHEM 287 Introductory Analytical Chemistry (2 credits)
CHEM 297 Introductory Analytical Chemistry Laboratory (1 credit)
CHEM 302 Introductory Organic Chemistry 3 (3 credits)
CHEM 332 Biological Chemistry (3 credits)
CHEM 345 Molecular Properties and Structure 1 (3 credits)
CHEM 355 Molecular Properties and Structure 2 (3 credits)
CHEM 365 Statistical Thermodynamics (2 credits)
CHEM 367 Instrumental Analysis 1 (3 credits)
CHEM 377 Instrumental Analysis 2 (3 credits)
CHEM 381 Inorganic Chemistry 2 (3 credits)
CHEM 392 Integrated Inorganic/Organic Laboratory (3 credits)
CHEM 493 Advanced Physical Chemistry Laboratory (2 credits)
MATH 222 Calculus 3 (3 credits) **
PHYS 242 Electricity and Magnetism (2 credits)

Complementary Courses (6 credits)

6 credits of Chemistry courses at the 400-level or higher, or MATH 315 plus 3 credits of Chemistry courses at the 400-level or higher.

Attach extra page(s) as needed

8.0 Consultation with
Related Units

Yes No

Financial Consult Yes No

Attach list of consultations

9. Approvals

Routing Sequence	Name	Signature	Date
Department			
Curric/Acad Committee			
Faculty 1			
Faculty 2			
Faculty 3			
SCTP			
GS			
APPC			
Senate			

Submitted by

Name
Phone
Email
Submission Date

To be completed by ARR:

CIP Code



<p>1.0 Degree Title Specify the two degrees for concurrent degree programs</p> <p>1.1 <input style="width: 100%;" type="text" value="B.Sc."/></p> <p>1.2 Concentration (Legacy = Concentration/Option) If applicable (30 char. max.) <input style="width: 100%;" type="text" value="Honours in Chemistry"/></p> <p>1.3 Minor (with Concentration, if applicable) (30 char. max.) <input style="width: 100%;" type="text"/></p> <p>1.4 Category</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> Faculty Program (FP) x Major Joint Major Major Concentration (CON) Minor Minor Concentration (CON) </td> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> Honours (HON) Joint Honours Component (HC) Internship/Co-op Thesis (T) Non-Thesis (N) Other Please specify </td> </tr> </table> <p>1.5 <input style="width: 100%;" type="text" value="B. Sc. Honours in Chemistry"/></p>	<ul style="list-style-type: none"> Faculty Program (FP) x Major Joint Major Major Concentration (CON) Minor Minor Concentration (CON) 	<ul style="list-style-type: none"> Honours (HON) Joint Honours Component (HC) Internship/Co-op Thesis (T) Non-Thesis (N) Other Please specify 	<p>2.0 Administering Faculty/Unit <input style="width: 100%;" type="text" value="Science/Chemistry"/></p> <p>Offering Faculty/Department</p> <p>3.0 Effective Term of revision or retirement Please give reasons in 5.0 "Rationale" in the case of retirement (Ex. Sept. 2004 = 200409) Retirement</p> <p>Term: 291509</p> <p>4.0 Existing Credit Weight Proposed Credit Weight</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;"><input style="width: 100%;" type="text" value="71"/></td> <td style="width: 50%;"><input style="width: 100%;" type="text" value="71"/></td> </tr> </table> <p>5.0 Rationale for revised program</p> <div style="border: 1px solid black; padding: 5px;"> <p>Under Required courses, CHEM 283 replaces CHEM 253 and CHEM 263 in a credit-neutral change. We are changing MATH 315 from a required course to a complementary course. As a department, we decided that 3 credits of ordinary differential equations are not core to a degree in chemistry. This will enable us to return some flexibility to our programs that was removed by the addition of CHEM 332 as required to retain accreditation. An additional 3 credits of Complementary courses are being added to maintain the credit weight of the program.</p> <p style="text-align: right;"><input type="checkbox"/></p> </div>	<input style="width: 100%;" type="text" value="71"/>	<input style="width: 100%;" type="text" value="71"/>
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<input style="width: 100%;" type="text" value="71"/>	<input style="width: 100%;" type="text" value="71"/>				

6.0 Revised Program Description (Maximum 150 words)

<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
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7.0 List of existing program and proposed program

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The required courses in this program consist of 53 credits in chemistry, physics and mathematics, listed below. The courses marked with an asterisk (*) are omitted from the program of students who have successfully completed them at the CEGEP level but the Chemistry courses must be replaced by courses in that discipline if students wish to be eligible for admission to the Ordre des chimistes du Québec. Students from outside Quebec or transfer students should consult the Academic Adviser.

See <http://www.chemistry.mcgill.ca/advising/inside/advisors.php>.

A computer science course, either COMP 202 or COMP 208, is strongly recommended during U1 for students who have no previous introduction to computer programming. Students should contact their adviser on this matter. Completion of Mathematics MATH 222 and MATH 315 during U1 is also strongly recommended. Physics PHYS 242 should be completed during U2.

* Denotes courses with CEGEP equivalents.

** Students who have successfully completed MATH 150 and MATH 151 are not required to take MATH 222.

CHEM 212 Introductory Organic Chemistry 1 (4 credits) *
CHEM 222 Introductory Organic Chemistry 2 (4 credits) *
CHEM 223 Introductory Physical Chemistry 1 (2 credits)
CHEM 243 Introductory Physical Chemistry 2 (2 credits)
CHEM 253 Introductory Physical Chemistry 1 Laboratory (1 credit)
CHEM 263 Introductory Physical Chemistry 2 Laboratory (1 credit)
CHEM 281 Inorganic Chemistry 1 (3 credits)
CHEM 287 Introductory Analytical Chemistry (2 credits)
CHEM 297 Introductory Analytical Chemistry Laboratory (1 credit)
CHEM 302 Introductory Organic Chemistry 3 (3 credits)
CHEM 332 Biological Chemistry
CHEM 345 Molecular Properties and Structure 1 (3 credits)
CHEM 355 Molecular Properties and Structure 2 (3 credits)
CHEM 365 Statistical Thermodynamics (2 credits)
CHEM 367 Instrumental Analysis 1 (3 credits)
CHEM 377 Instrumental Analysis 2 (3 credits)
CHEM 381 Inorganic Chemistry 2 (3 credits)
CHEM 392 Integrated Inorganic/Organic Laboratory (3 credits)
CHEM 493 Advanced Physical Chemistry Laboratory (2 credits)
MATH 222 Calculus 3 (3 credits) **
MATH 315 Ordinary Differential Equations (3 credits)
PHYS 242 Electricity and Magnetism (2 credits)

Complementary Courses (15 credits)

6 credits of research*:

* Students may take up to 12 Research Project credits but only 6 of these may be used to fulfil the program requirement.

- CHEM 470 Research Project 1 (6 credits)
- CHEM 480 Research Project 2 (3 credits)

9 credits of additional Chemistry courses as follows:

3 credits of which must be at the 300 level or higher, and
6 credits of which must be at the 400 level or higher.

Proposed program (list courses as follows: Subj Code/Crse Num, Title, Credit weight, under the headings of: Required Courses, Complementary Courses, Elective Courses)

Required Courses (53 credits)

The required courses in this program consist of 53 credits in chemistry, physics and mathematics, listed below. The courses marked with an asterisk (*) are omitted from the program of students who have successfully completed them at the CEGEP level but the Chemistry courses must be replaced by courses in that discipline if students wish to be eligible for admission to the Ordre des chimistes du Québec. Students from outside Quebec or transfer students should consult the Academic Adviser.

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A computer science course, either COMP 202 or COMP 208, is strongly recommended during U1 for students who have no previous introduction to computer programming. Students should contact their adviser on this matter. Completion of Mathematics MATH 222 during U1 is also strongly recommended. Physics PHYS 242 should be completed during U2.

* Denotes courses with CEGEP equivalents.

** Students who have successfully completed MATH 150 and MATH 151 are not required to take MATH 222.

CHEM 212 Introductory Organic Chemistry 1 (4 credits) *
CHEM 222 Introductory Organic Chemistry 2 (4 credits) *
CHEM 223 Introductory Physical Chemistry 1 (2 credits)
CHEM 243 Introductory Physical Chemistry 2 (2 credits)
CHEM 283 Introductory Physical Chemistry 2 Laboratory (2 credits)
CHEM 281 Inorganic Chemistry 1 (3 credits)
CHEM 287 Introductory Analytical Chemistry (2 credits)
CHEM 297 Introductory Analytical Chemistry Laboratory (1 credit)
CHEM 302 Introductory Organic Chemistry 3 (3 credits)
CHEM 332 Biological Chemistry (3 credits)
CHEM 345 Molecular Properties and Structure 1 (3 credits)
CHEM 355 Molecular Properties and Structure 2 (3 credits)
CHEM 365 Statistical Thermodynamics (2 credits)
CHEM 367 Instrumental Analysis 1 (3 credits)
CHEM 377 Instrumental Analysis 2 (3 credits)
CHEM 381 Inorganic Chemistry 2 (3 credits)
CHEM 392 Integrated Inorganic/Organic Laboratory (3 credits)
CHEM 493 Advanced Physical Chemistry Laboratory (2 credits)
MATH 222 Calculus 3 (3 credits) **
PHYS 242 Electricity and Magnetism (2 credits)

Complementary Courses (18 credits)

6 credits of research*:

* Students may take up to 12 Research Project credits but only 6 of these may be used to fulfil the program requirement.

- CHEM 470 Research Project 1 (6 credits)
- CHEM 480 Research Project 2 (3 credits)

12 credits of additional courses as follows:

6 credits of Chemistry courses at the 300 level or higher,
or MATH 315 plus 3 credits of Chemistry courses at the
300-level or higher, and

6 credits from chemistry courses at the 400 level or higher.

Attach extra page(s) as needed

8.0 Consultation with
Related Units

Yes No

Financial Consult Yes No

Attach list of consultations

9. Approvals

Routing Sequence	Name	Signature	Date
Department			
Curric/Acad Committee			
Faculty 1			
Faculty 2			
Faculty 3			
SCTP			
GS			
APPC			
Senate			

Submitted by

Name
Phone
Email
Submission Date

To be completed by ARR:

CIP Code



<p>1.0 Degree Title Specify the two degrees for concurrent degree programs</p>	<p>2.0 Administering Faculty/Unit <input type="text" value="Science/Chemistry"/></p>																
<p>1.1 <input type="text" value="B.Sc."/></p>	<p>Offering Faculty/Department</p>																
<p>1.2 Concentration (Legacy = Concentration/Option) If applicable (30 char. max.) <input type="text" value="Major in Chemistry with Bio-Organic Option"/></p>	<p>3.0 Effective Term of revision or retirement Please give reasons in 5.0 "Rationale" in the case of retirement (Ex. Sept. 2004 = 200409) Retirement</p> <p>Term: 201509</p>																
<p>1.3 Minor (with Concentration, if applicable) (30 char. max.) <input type="text"/></p>	<p>4.0 Existing Credit Weight Proposed Credit Weight</p> <p><input type="text" value="63"/> <input type="text" value="63"/></p>																
<p>1.4 Category</p> <table border="0"> <tr> <td>Faculty Program (FP)</td> <td>Honours (HON)</td> </tr> <tr> <td>Major X</td> <td>Joint Honours</td> </tr> <tr> <td>Joint Major</td> <td>Component (HC)</td> </tr> <tr> <td>Major Concentration (CON)</td> <td>Internship/Co-op</td> </tr> <tr> <td>Minor</td> <td>Thesis (T)</td> </tr> <tr> <td>Minor Concentration (CON)</td> <td>Non-Thesis (N)</td> </tr> <tr> <td></td> <td>Other</td> </tr> <tr> <td></td> <td>Please specify</td> </tr> </table>	Faculty Program (FP)	Honours (HON)	Major X	Joint Honours	Joint Major	Component (HC)	Major Concentration (CON)	Internship/Co-op	Minor	Thesis (T)	Minor Concentration (CON)	Non-Thesis (N)		Other		Please specify	<p>5.0 Rationale for revised program</p> <div style="border: 1px solid black; padding: 5px;"> <p>Under Required courses, CHEM 283 replaces CHEM 253 and CHEM 263 in a credit-neutral change. We are changing MATH 315 from a required course to a complementary course. As a department, we decided that 3 credits of ordinary differential equations are not core to a degree in chemistry. In order to accommodate this as a credit-neutral change, we are increasing the Complementary courses by 3 credits. We are also putting PHYS 242 in as a required course, since it is an important prerequisite for CHEM 355. In order to accommodate this as a credit-neutral change, we will remove CHEM 365 as a required course.</p> <p style="text-align: right;"><input type="checkbox"/></p> </div>
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Minor	Thesis (T)																
Minor Concentration (CON)	Non-Thesis (N)																
	Other																
	Please specify																
<p>1.5 <input type="text" value="B. Sc. Major in Chemistry Bio-Organic Option"/></p>																	

6.0 Revised Program Description (Maximum 150 words)

<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
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7.0 List of existing program and proposed program

Existing program (list courses as follows: Subj Code/Crse Num, Title, Credit weight, under the headings of: Required Courses, Complementary Courses, Elective Courses)

Required Courses (60 credits)

The required courses in this program consist of 60 credits in chemistry, biology and mathematics, listed below. The courses marked with an asterisk (*) are omitted from the program of students who have successfully completed them at the CEGEP level but the Chemistry courses must be replaced by courses in that discipline if students wish to be eligible for admission to the Ordre des chimistes du Québec. Students from outside Quebec or transfer students should consult the Academic Adviser.

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A computer science course, either COMP 202 or COMP 208, is strongly recommended during U1 for students who have no previous introduction to computer programming. Students should contact their adviser on this matter. Completion of Mathematics MATH 222 and MATH 315 during U1 is also strongly recommended.

* Denotes courses with CEGEP equivalents.

** Students who have successfully completed MATH 150 and MATH 151 are not required to take MATH 222.

BIOL 200 Molecular Biology (3 credits)
BIOL 201 Cell Biology and Metabolism (3 credits)
CHEM 212 Introductory Organic Chemistry 1 (4 credits) *
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CHEM 223 Introductory Physical Chemistry 1 (2 credits)
CHEM 243 Introductory Physical Chemistry 2 (2 credits)
CHEM 253 Introductory Physical Chemistry 1 Laboratory (1 credit)
CHEM 263 Introductory Physical Chemistry 2 Laboratory (1 credit)
CHEM 281 Inorganic Chemistry 1 (3 credits)
CHEM 287 Introductory Analytical Chemistry (2 credits)
CHEM 297 Introductory Analytical Chemistry Laboratory (1 credit)
CHEM 302 Introductory Organic Chemistry 3 (3 credits)
CHEM 345 Molecular Properties and Structure 1 (3 credits)
CHEM 355 Molecular Properties and Structure 2 (3 credits)
CHEM 365 Statistical Thermodynamics (2 credits)
CHEM 367 Instrumental Analysis 1 (3 credits)
CHEM 377 Instrumental Analysis 2 (3 credits)
CHEM 381 Inorganic Chemistry 2 (3 credits)
CHEM 392 Integrated Inorganic/Organic Laboratory (3 credits)
CHEM 493 Advanced Physical Chemistry Laboratory (2 credits)
CHEM 502 Advanced Bio-Organic Chemistry (3 credits)
MATH 222 Calculus 3 (3 credits) **
MATH 315 Ordinary Differential Equations (3 credits)

Complementary Course (3 credits)

One of:

BIOL 202 Basic Genetics (3 credits)
BIOL 301 Cell and Molecular Laboratory (4 credits)
MIMM 211 Introductory Microbiology (3 credits)
PHGY 209 Mammalian Physiology 1 (3 credits)
PHGY 210 Mammalian Physiology 2 (3 credits)

Proposed program (list courses as follows: Subj Code/Crse Num, Title, Credit weight, under the headings of: Required Courses, Complementary Courses, Elective Courses)

Required Courses (57 credits)

The required courses in this program consist of 60 credits in chemistry, biology and mathematics, listed below. The courses marked with an asterisk (*) are omitted from the program of students who have successfully completed them at the CEGEP level but the Chemistry courses must be replaced by courses in that discipline if students wish to be eligible for admission to the Ordre des chimistes du Québec. Students from outside Quebec or transfer students should consult the Academic Adviser.

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A computer science course, either COMP 202 or COMP 208, is strongly recommended during U1 for students who have no previous introduction to computer programming. Students should contact their adviser on this matter. Completion of Mathematics MATH 222 during U1 is also strongly recommended.

* Denotes courses with CEGEP equivalents.

** Students who have successfully completed MATH 150 and MATH 151 are not required to take MATH 222.

BIOL 200 Molecular Biology (3 credits)
BIOL 201 Cell Biology and Metabolism (3 credits)
CHEM 212 Introductory Organic Chemistry 1 (4 credits) *
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CHEM 223 Introductory Physical Chemistry 1 (2 credits)
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CHEM 283 Introductory Physical Chemistry Laboratory (2 credits)
CHEM 281 Inorganic Chemistry 1 (3 credits)
CHEM 287 Introductory Analytical Chemistry (2 credits)
CHEM 297 Introductory Analytical Chemistry Laboratory (1 credit)
CHEM 302 Introductory Organic Chemistry 3 (3 credits)
CHEM 345 Molecular Properties and Structure 1 (3 credits)
CHEM 355 Molecular Properties and Structure 2 (3 credits)
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CHEM 377 Instrumental Analysis 2 (3 credits)
CHEM 381 Inorganic Chemistry 2 (3 credits)
CHEM 392 Integrated Inorganic/Organic Laboratory (3 credits)
CHEM 493 Advanced Physical Chemistry Laboratory (2 credits)
CHEM 502 Advanced Bio-Organic Chemistry (3 credits)
MATH 222 Calculus 3 (3 credits) **
PHYS 242 Electricity and Magnetism (2 credits)

Complementary Courses (6 credits)

Two of:

BIOL 202 Basic Genetics (3 credits)
BIOL 301 Cell and Molecular Laboratory (4 credits)
MIMM 211 Introductory Microbiology (3 credits)
PHGY 209 Mammalian Physiology 1 (3 credits)
PHGY 210 Mammalian Physiology 2 (3 credits)
MATH 315 Ordinary Differential Equations (3 credits)
CHEM 365 Statistical Thermodynamics (2 credits)

Attach extra page(s) as needed

8.0 Consultation with
Related Units

Yes No

Financial Consult Yes No

Attach list of consultations

9. Approvals

Routing Sequence	Name	Signature	Date
Department			
Curric/Acad Committee			
Faculty 1			
Faculty 2			
Faculty 3			
SCTP			
GS			
APPC			
Senate			

Submitted by

Name
Phone
Email
Submission Date

To be completed by ARR:

CIP Code



<p>1.0 Degree Title Specify the two degrees for concurrent degree programs</p> <p>1.1 <input style="width: 100%;" type="text" value="B.Sc."/></p> <p>1.2 Concentration (Legacy = Concentration/Option) If applicable (30 char. max.) <input style="width: 100%;" type="text" value="Honours in Chemistry with Bio-Organic option"/></p> <p>1.3 Minor (with Concentration, if applicable) (30 char. max.) <input style="width: 100%;" type="text"/></p> <p>1.4 Category</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">Faculty Program (FP)</td> <td style="width: 50%; border: none;">Honours (HON) <input checked="" type="checkbox"/></td> </tr> <tr> <td style="border: none;">Major</td> <td style="border: none;">Joint Honours</td> </tr> <tr> <td style="border: none;">Joint Major</td> <td style="border: none;">Component (HC)</td> </tr> <tr> <td style="border: none;">Major Concentration (CON)</td> <td style="border: none;">Internship/Co-op</td> </tr> <tr> <td style="border: none;">Minor</td> <td style="border: none;">Thesis (T)</td> </tr> <tr> <td style="border: none;">Minor Concentration (CON)</td> <td style="border: none;">Non-Thesis (N)</td> </tr> <tr> <td style="border: none;"></td> <td style="border: none;">Other</td> </tr> <tr> <td style="border: none;"></td> <td style="border: none;">Please specify</td> </tr> </table> <p>1.5 <input style="width: 100%;" type="text" value="B. Sc. Honours in Chemistry with Bio-Organic Option"/></p>	Faculty Program (FP)	Honours (HON) <input checked="" type="checkbox"/>	Major	Joint Honours	Joint Major	Component (HC)	Major Concentration (CON)	Internship/Co-op	Minor	Thesis (T)	Minor Concentration (CON)	Non-Thesis (N)		Other		Please specify	<p>2.0 Administering Faculty/Unit <input style="width: 100%;" type="text" value="Science/Chemistry"/></p> <p>Offering Faculty/Department</p> <p>3.0 Effective Term of revision or retirement Please give reasons in 5.0 "Rationale" in the case of retirement (Ex. Sept. 2004 = 200409) Retirement</p> <p>Term: 201509</p> <p>4.0 Existing Credit Weight Proposed Credit Weight</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: 1px solid black; text-align: center;">75</td> <td style="width: 50%; border: 1px solid black; text-align: center;">75</td> </tr> </table> <p>5.0 Rationale for revised program</p> <div style="border: 1px solid black; padding: 5px;"> <p>Under Required courses, CHEM 283 replaces CHEM 253 and CHEM 263 in a credit-neutral change. We are changing MATH 315 from a required course to a complementary course. As a department, we decided that 3 credits of ordinary differential equations are not core to a degree in chemistry. We are also putting PHYS 242 in as a required course, since it is an important prerequisite for CHEM 355. In order to accommodate this as a credit-neutral change, we will remove CHEM 365 as a required course. CHEM 502 will be restored as a required course to harmonize core requirements with the Majors option program, and to restore the credits reduced by the removal of MATH 315.</p> <p style="text-align: right;"><input type="checkbox"/></p> </div>	75	75
Faculty Program (FP)	Honours (HON) <input checked="" type="checkbox"/>																		
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	Please specify																		
75	75																		

6.0 Revised Program Description (Maximum 150 words)

<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
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7.0 List of existing program and proposed program

Existing program (list courses as follows: Subj Code/Crse Num, Title, Credit weight, under the headings of: Required Courses, Complementary Courses, Elective Courses)

Required Courses (57 credits)

The required courses in this program consist of 57 credits in chemistry, biology and mathematics, listed below. The courses marked with an asterisk (*) are omitted from the program of students who have successfully completed them at the CEGEP level but the Chemistry courses must be replaced by courses in that discipline if students wish to be eligible for admission to the Ordre des chimistes du Québec. Students from outside Quebec or transfer students should consult the Academic Adviser.

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A computer science course, either COMP 202 or COMP 208, is strongly recommended during U1 for students who have no previous introduction to computer programming. Students should contact their adviser on this matter. Completion of Mathematics MATH 222 and MATH 315 during U1 is also strongly recommended.

* Denotes courses with CEGEP equivalents.

** Students who have successfully completed MATH 150 and MATH 151 are not required to take MATH 222.

BIOL 200 Molecular Biology (3 credits)
BIOL 201 Cell Biology and Metabolism (3 credits)
CHEM 212 Introductory Organic Chemistry 1 (4 credits) *
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CHEM 223 Introductory Physical Chemistry 1 (2 credits)
CHEM 243 Introductory Physical Chemistry 2 (2 credits)
CHEM 253 Introductory Physical Chemistry 1 Laboratory (1 credit)
CHEM 263 Introductory Physical Chemistry 2 Laboratory (1 credit)
CHEM 281 Inorganic Chemistry 1 (3 credits)
CHEM 287 Introductory Analytical Chemistry (2 credits)
CHEM 297 Introductory Analytical Chemistry Laboratory (1 credit)
CHEM 302 Introductory Organic Chemistry 3 (3 credits)
CHEM 345 Molecular Properties and Structure 1 (3 credits)
CHEM 355 Molecular Properties and Structure 2 (3 credits)
CHEM 365 Statistical Thermodynamics (2 credits)
CHEM 367 Instrumental Analysis 1 (3 credits)
CHEM 377 Instrumental Analysis 2 (3 credits)
CHEM 381 Inorganic Chemistry 2 (3 credits)
CHEM 392 Integrated Inorganic/Organic Laboratory (3 credits)
CHEM 493 Advanced Physical Chemistry Laboratory (2 credits)
MATH 222 Calculus 3 (3 credits) **
MATH 315 Ordinary Differential Equations (3 credits)

Complementary Courses (18 credits)

18 credits selected as follows:

6 credits of research*:

* Students may take up to 12 Research Project credits but only 6 of these may be used to fulfil the program requirement.

CHEM 470 Research Project 1 (6 credits)
CHEM 480 Research Project 2 (3 credits)

6 credits, **two of the following courses:**

BIOL 202 Basic Genetics (3 credits)
BIOL 301 Cell and Molecular Laboratory (4 credits)
CHEM 502 Advanced Bio-Organic Chemistry (3 credits)
MIMM 211 Introductory Microbiology (3 credits)
MIMM 214 Introductory Immunology: Elements of Immunity (3 credits)
MIMM 314 Intermediate Immunology (3 credits)
MIMM 323 Microbial Physiology (3 credits)
PHGY 209 Mammalian Physiology 1 (3 credits)
PHGY 210 Mammalian Physiology 2 (3 credits)

and 6 credits of additional Chemistry courses at the 400 level or higher.

Proposed program (list courses as follows: Subj Code/Crse Num, Title, Credit weight, under the headings of: Required Courses, Complementary Courses, Elective Courses)

Required Courses (57 credits)

The required courses in this program consist of 60 credits in chemistry, biology and mathematics, listed below. The courses marked with an asterisk (*) are omitted from the program of students who have successfully completed them at the CEGEP level but the Chemistry courses must be replaced by courses in that discipline if students wish to be eligible for admission to the Ordre des chimistes du Québec. Students from outside Quebec or transfer students should consult the Academic Adviser.

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A computer science course, either COMP 202 or COMP 208, is strongly recommended during U1 for students who have no previous introduction to computer programming. Students should contact their adviser on this matter. Completion of Mathematics MATH 222 during U1 is also strongly recommended.

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CHEM 493 Advanced Physical Chemistry Laboratory (2 credits)
CHEM 502 Advanced Bio-Organic Chemistry (3 credits)
MATH 222 Calculus 3 (3 credits) **
PHYS 242 Electricity and Magnetism (2 credits)

18 credits selected as follows:

6 credits of research*:

* Students may take up to 12 Research Project credits but only 6 of these may be used to fulfil the program requirement.

CHEM 470 Research Project 1 (6 credits)
CHEM 480 Research Project 2 (3 credits)

6 credits, **three of the following courses:**

BIOL 202 Basic Genetics (3 credits)
BIOL 301 Cell and Molecular Laboratory (4 credits)
MIMM 211 Introductory Microbiology (3 credits)
MIMM 214 Introductory Immunology: Elements of Immunity (3 credits)
MIMM 314 Intermediate Immunology (3 credits)
MIMM 323 Microbial Physiology (3 credits)
PHGY 209 Mammalian Physiology 1 (3 credits)
PHGY 210 Mammalian Physiology 2 (3 credits)
MATH 315 Ordinary Differential Equations (3 credits)
CHEM 365 Statistical Thermodynamics (2 credits)

and 6 credits of additional Chemistry courses at the 400 level or higher.

Attach extra page(s) as needed

8.0 Consultation with
Related Units

Yes No

Financial Consult Yes No

Attach list of consultations

9. Approvals

Routing Sequence	Name	Signature	Date
Department			
Curric/Acad Committee			
Faculty 1			
Faculty 2			
Faculty 3			
SCTP			
GS			
APPC			
Senate			

Submitted by

Name
Phone
Email
Submission Date

To be completed by ARR:

CIP Code



<p>1.0 Degree Title Specify the two degrees for concurrent degree programs</p> <p>1.1 <input style="width: 100%;" type="text" value="B.Sc."/></p> <p>1.2 Concentration (Legacy = Concentration/Option) If applicable (30 char. max.) <input style="width: 100%;" type="text" value="Major in Chemistry with Materials Option"/></p> <p>1.3 Minor (with Concentration, if applicable) (30 char. max.) <input style="width: 100%;" type="text"/></p> <p>1.4 Category</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> Faculty Program (FP) Major <input checked="" type="checkbox"/> Joint Major Major Concentration (CON) Minor Minor Concentration (CON) </td> <td style="width: 50%; vertical-align: top;"> Honours (HON) Joint Honours Component (HC) Internship/Co-op Thesis (T) Non-Thesis (N) Other Please specify </td> </tr> </table> <p>1.5 <input style="width: 100%;" type="text" value="B. Sc. Major in Chemistry with Materials Option"/></p>	Faculty Program (FP) Major <input checked="" type="checkbox"/> Joint Major Major Concentration (CON) Minor Minor Concentration (CON)	Honours (HON) Joint Honours Component (HC) Internship/Co-op Thesis (T) Non-Thesis (N) Other Please specify	<p>2.0 Administering Faculty/Unit <input style="width: 100%;" type="text" value="Science/Chemistry"/></p> <p>Offering Faculty/Department</p> <p>3.0 Effective Term of revision or retirement Please give reasons in 5.0 "Rationale" in the case of retirement (Ex. Sept. 2004 = 200409) Retirement</p> <p>Term: 201509</p> <p>4.0 Existing Credit Weight Proposed Credit Weight</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;"><input style="width: 100%;" type="text" value="62"/></td> <td style="width: 50%;"><input style="width: 100%;" type="text" value="62"/></td> </tr> </table> <p>5.0 Rationale for revised program</p> <div style="border: 1px solid black; padding: 5px;"> <p>Under Required courses, CHEM 283 replaces CHEM 253 and CHEM 263 in a credit-neutral change. We are changing MATH 315 from a required course to a complementary course. As a department, we decided that 3 credits of ordinary differential equations are not core to a degree in chemistry. This will enable us to return some flexibility to our programs that was removed by the addition of CHEM 332 as required to retain accreditation. Three credits of Complementary courses are being added to maintain the credit weight of the program.</p> <p style="text-align: right;"><input type="checkbox"/></p> </div>	<input style="width: 100%;" type="text" value="62"/>	<input style="width: 100%;" type="text" value="62"/>
Faculty Program (FP) Major <input checked="" type="checkbox"/> Joint Major Major Concentration (CON) Minor Minor Concentration (CON)	Honours (HON) Joint Honours Component (HC) Internship/Co-op Thesis (T) Non-Thesis (N) Other Please specify				
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7.0 List of existing program and proposed program

Existing program (list courses as follows: Subj Code/Crse Num, Title, Credit weight, under the headings of: Required Courses, Complementary Courses, Elective Courses)

Required Courses (62 credits)

The required courses in this program consist of 59 credits in chemistry, physics and mathematics, listed below. The courses marked with an asterisk (*) are omitted from the program of students who have successfully completed them at the CEGEP level but the Chemistry courses must be replaced by courses in that discipline if students wish to be eligible for admission to the Ordre des chimistes du Québec. Students from outside Quebec or transfer students should consult the Academic Adviser.

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A computer science course, either COMP 202 or COMP 208, is strongly recommended during U1 for students who have no previous introduction to computer programming. Students should contact their adviser on this matter. Completion of Mathematics MATH 222 and MATH 315 during U1 is also strongly recommended. Physics PHYS 242 should be completed during U2.

* Denotes courses with CEGEP equivalents.

** Students who have successfully completed MATH 150 and MATH 151 are not required to take MATH 222.

CHEM 212 Introductory Organic Chemistry 1 (4 credits) *
CHEM 222 Introductory Organic Chemistry 2 (4 credits) *
CHEM 223 Introductory Physical Chemistry 1 (2 credits)
CHEM 243 Introductory Physical Chemistry 2 (2 credits)
CHEM 253 Introductory Physical Chemistry 1 Laboratory (1 credit)
CHEM 263 Introductory Physical Chemistry 2 Laboratory (1 credit)
CHEM 281 Inorganic Chemistry 1 (3 credits)
CHEM 287 Introductory Analytical Chemistry (2 credits)
CHEM 297 Introductory Analytical Chemistry Laboratory (1 credit)
CHEM 302 Introductory Organic Chemistry 3 (3 credits)
CHEM 332 Biological Chemistry (3 credits)
CHEM 334 Advanced Materials (3 credits)
CHEM 345 Molecular Properties and Structure 1 (3 credits)
CHEM 355 Molecular Properties and Structure 2 (3 credits)
CHEM 365 Statistical Thermodynamics (2 credits)
CHEM 367 Instrumental Analysis 1 (3 credits)
CHEM 377 Instrumental Analysis 2 (3 credits)
CHEM 381 Inorganic Chemistry 2 (3 credits)
CHEM 392 Integrated Inorganic/Organic Laboratory (3 credits)
CHEM 493 Advanced Physical Chemistry Laboratory (2 credits)
CHEM 574 Introductory Polymer Chemistry (3 credits)
MATH 222 Calculus 3 (3 credits)
MATH 315 Ordinary Differential Equations (3 credits)
PHYS 242 Electricity and Magnetism (2 credits)

Proposed program (list courses as follows: Subj Code/Crse Num, Title, Credit weight, under the headings of: Required Courses, Complementary Courses, Elective Courses)

Required Courses (59 credits)

The required courses in this program consist of 59 credits in chemistry, physics and mathematics, listed below. The courses marked with an asterisk (*) are omitted from the program of students who have successfully completed them at the CEGEP level but the Chemistry courses must be replaced by courses in that discipline if students wish to be eligible for admission to the Ordre des chimistes du Québec. Students from outside Quebec or transfer students should consult the Academic Adviser.

See <http://www.chemistry.mcgill.ca/advising/inside/advisors.php>.

A computer science course, either COMP 202 or COMP 208, is strongly recommended during U1 for students who have no previous introduction to computer programming. Students should contact their adviser on this matter. Completion of Mathematics MATH 222 during U1 is also strongly recommended. Physics PHYS 242 should be completed during U2.

* Denotes courses with CEGEP equivalents.

** Students who have successfully completed MATH 150 and MATH 151 are not required to take MATH 222.

CHEM 212 Introductory Organic Chemistry 1 (4 credits) *
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CHEM 283 Introductory Physical Chemistry 1 Laboratory (2 credits)
CHEM 281 Inorganic Chemistry 1 (3 credits)
CHEM 287 Introductory Analytical Chemistry (2 credits)
CHEM 297 Introductory Analytical Chemistry Laboratory (1 credit)
CHEM 302 Introductory Organic Chemistry 3 (3 credits)
CHEM 332 Biological Chemistry (3 credits)
CHEM 334 Advanced Materials (3 credits)
CHEM 345 Molecular Properties and Structure 1 (3 credits)
CHEM 355 Molecular Properties and Structure 2 (3 credits)
CHEM 365 Statistical Thermodynamics (2 credits)
CHEM 367 Instrumental Analysis 1 (3 credits)
CHEM 377 Instrumental Analysis 2 (3 credits)
CHEM 381 Inorganic Chemistry 2 (3 credits)
CHEM 392 Integrated Inorganic/Organic Laboratory (3 credits)
CHEM 493 Advanced Physical Chemistry Laboratory (2 credits)
CHEM 574 Introductory Polymer Chemistry (3 credits)
MATH 222 Calculus 3 (3 credits)
PHYS 242 Electricity and Magnetism (2 credits)

Complementary Courses (3 credits)

3 credits, one of:

CHEM 531 Chemistry of Inorganic Materials (3 credits)
CHEM 534 Nanoscience and Nanotechnology (3 credits)
CHEM 543 Chemistry of Pulp and Paper (3 credits)
CHEM 571 Polymer Synthesis (3 credits)
CHEM 585 Colloid Chemistry (3 credits)
MATH 315 Ordinary Differential Equations (3 credits)

Attach extra page(s) as needed

8.0 Consultation with
Related Units

Yes No

Financial Consult Yes No

Attach list of consultations

9. Approvals

Routing Sequence	Name	Signature	Date
Department			
Curric/Acad Committee			
Faculty 1			
Faculty 2			
Faculty 3			
SCTP			
GS			
APPC			
Senate			

Submitted by

Name
Phone
Email
Submission Date

To be completed by ARR:

CIP Code



<p>1.0 Degree Title Specify the two degrees for concurrent degree programs</p> <p>1.1 <input style="width: 100%;" type="text" value="B.Sc."/></p> <p>1.2 Concentration (Legacy = Concentration/Option) If applicable (30 char. max.) <input style="width: 100%;" type="text" value="Honours in Chemistry with Materials option"/></p> <p>1.3 Minor (with Concentration, if applicable) (30 char. max.) <input style="width: 100%;" type="text"/></p> <p>1.4 Category</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"> Faculty Program (FP) x Major Joint Major Major Concentration (CON) Minor Minor Concentration (CON) </td> <td style="width: 50%; border: none;"> Honours (HON) Joint Honours Component (HC) Internship/Co-op Thesis (T) Non-Thesis (N) Other Please specify </td> </tr> </table> <p>1.5 <input style="width: 100%;" type="text" value="B. Sc. Honours in Chemistry with Materials Option"/></p>	Faculty Program (FP) x Major Joint Major Major Concentration (CON) Minor Minor Concentration (CON)	Honours (HON) Joint Honours Component (HC) Internship/Co-op Thesis (T) Non-Thesis (N) Other Please specify	<p>2.0 Administering Faculty/Unit <input style="width: 100%;" type="text" value="Science/Chemistry"/></p> <p>Offering Faculty/Department</p> <p>3.0 Effective Term of revision or retirement Please give reasons in 5.0 "Rationale" in the case of retirement (Ex. Sept. 2004 = 200409) Retirement</p> <p>Term: 201509</p> <p>4.0 Existing Credit Weight Proposed Credit Weight</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: 1px solid black; text-align: center;">74</td> <td style="width: 50%; border: 1px solid black; text-align: center;">74</td> </tr> </table> <p>5.0 Rationale for revised program</p> <div style="border: 1px solid black; padding: 5px;"> <p>Under Required courses, CHEM 283 replaces CHEM 253 and CHEM 263 in a credit-neutral change. We are changing MATH 315 from a required course to a complementary course. As a department, we decided that 3 credits of ordinary differential equations are not core to a degree in chemistry. This will enable us to return some flexibility to our programs that was removed by the addition of CHEM 332 as required to retain accreditation. An additional 3 credits of Complementary courses are being added to maintain the credit weight of the program.</p> <p style="text-align: right;">□</p> </div>	74	74
Faculty Program (FP) x Major Joint Major Major Concentration (CON) Minor Minor Concentration (CON)	Honours (HON) Joint Honours Component (HC) Internship/Co-op Thesis (T) Non-Thesis (N) Other Please specify				
74	74				

6.0 Revised Program Description (Maximum 150 words)

<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
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7.0 List of existing program and proposed program

Existing program (list courses as follows: Subj Code/Crse Num, Title, Credit weight, under the headings of: Required Courses, Complementary Courses, Elective Courses)

Required Courses (68 credits)

The required courses in this program consist of 65 credits in chemistry, physics and mathematics, listed below. The courses marked with an asterisk (*) are omitted from the program of students who have successfully completed them at the CEGEP level but the Chemistry courses must be replaced by courses in that discipline if students wish to be eligible for admission to the Ordre des chimistes du Québec. Students from outside Quebec or transfer students should consult the Academic Adviser.
See <http://www.chemistry.mcgill.ca/advising/inside/advisors.php>.

A computer science course, either COMP 202 or COMP 208, is strongly recommended during U1 for students who have no previous introduction to computer programming. Students should contact their adviser on this matter. Completion of Mathematics MATH 222 and MATH 315 during U1 is also strongly recommended. Physics PHYS 242 should be completed during U2.

* Denotes courses with CEGEP equivalents.

** Students who have successfully completed MATH 150 and MATH 151 are not required to take MATH 222.

*** Students may take up to 12 Research Project credits but only 6 of these may be used to fulfil the program requirement.

CHEM 212 Introductory Organic Chemistry 1 (4 credits) *
CHEM 222 Introductory Organic Chemistry 2 (4 credits) *
CHEM 223 Introductory Physical Chemistry 1 (2 credits)
CHEM 243 Introductory Physical Chemistry 2 (2 credits)
CHEM 253 Introductory Physical Chemistry 1 Laboratory (1 credit)
CHEM 263 Introductory Physical Chemistry 2 Laboratory (1 credit)
CHEM 281 Inorganic Chemistry 1 (3 credits)
CHEM 287 Introductory Analytical Chemistry (2 credits)
CHEM 297 Introductory Analytical Chemistry Laboratory (1 credit)
CHEM 302 Introductory Organic Chemistry 3 (3 credits)
CHEM 332 Biological Chemistry (3 credits)
CHEM 334 Advanced Materials (3 credits)
CHEM 345 Molecular Properties and Structure 1 (3 credits)
CHEM 355 Molecular Properties and Structure 2 (3 credits)
CHEM 365 Statistical Thermodynamics (2 credits)
CHEM 367 Instrumental Analysis 1 (3 credits)
CHEM 377 Instrumental Analysis 2 (3 credits)
CHEM 381 Inorganic Chemistry 2 (3 credits)
CHEM 392 Integrated Inorganic/Organic Laboratory (3 credits)
CHEM 493 Advanced Physical Chemistry Laboratory (2 credits)
CHEM 470 Research Project 1 (6 credits)***
CHEM 574 Introductory Polymer Chemistry (3 credits)
MATH 222 Calculus 3 (3 credits) **
MATH 315 Ordinary Differential Equations (3 credits)
PHYS 242 Electricity and Magnetism (2 credits)

Complementary Courses (6 credits)

6 credits, two of:

* Students take either ANAT 542 or MIME 542.

ANAT 542 Transmission Electron Microscopy (3 credits) *
CHEM 462 Green Chemistry (3 credits)
CHEM 531 Chemistry of Inorganic Materials (3 credits)
CHEM 533 Small Molecule Crystallography (3 credits)
CHEM 534 Nanoscience and Nanotechnology (3 credits)
CHEM 571 Polymer Synthesis (3 credits)
CHEM 582 Supramolecular Chemistry (3 credits)
CHEM 585 Colloid Chemistry (3 credits)
MIME 260 Materials Science and Engineering (3 credits)
MIME 542 Transmission Electron Microscopy (3 credits) *

Proposed program (list courses as follows: Subj Code/Crse Num, Title, Credit weight, under the headings of: Required Courses, Complementary Courses, Elective Courses)

Required Courses (65 credits)

The required courses in this program consist of 65 credits in chemistry, physics and mathematics, listed below. The courses marked with an asterisk (*) are omitted from the program of students who have successfully completed them at the CEGEP level but the Chemistry courses must be replaced by courses in that discipline if students wish to be eligible for admission to the Ordre des chimistes du Québec. Students from outside Quebec or transfer students should consult the Academic Adviser.
See <http://www.chemistry.mcgill.ca/advising/inside/advisors.php>.

A computer science course, either COMP 202 or COMP 208, is strongly recommended during U1 for students who have no previous introduction to computer programming. Students should contact their adviser on this matter. Completion of Mathematics MATH 222 during U1 is also strongly recommended. Physics PHYS 242 should be completed during U2.

* Denotes courses with CEGEP equivalents.

** Students who have successfully completed MATH 150 and MATH 151 are not required to take MATH 222.

*** Students may take up to 12 Research Project credits but only 6 of these may be used to fulfil the program requirement.

CHEM 212 Introductory Organic Chemistry 1 (4 credits) *
CHEM 222 Introductory Organic Chemistry 2 (4 credits) *
CHEM 223 Introductory Physical Chemistry 1 (2 credits)
CHEM 243 Introductory Physical Chemistry 2 (2 credits)
CHEM 283 Introductory Physical Chemistry 2 Laboratory (2 credits)
CHEM 281 Inorganic Chemistry 1 (3 credits)
CHEM 287 Introductory Analytical Chemistry (2 credits)
CHEM 297 Introductory Analytical Chemistry Laboratory (1 credit)
CHEM 302 Introductory Organic Chemistry 3 (3 credits)
CHEM 332 Biological Chemistry (3 credits)
CHEM 334 Advanced Materials (3 credits)
CHEM 345 Molecular Properties and Structure 1 (3 credits)
CHEM 355 Molecular Properties and Structure 2 (3 credits)
CHEM 365 Statistical Thermodynamics (2 credits)
CHEM 367 Instrumental Analysis 1 (3 credits)
CHEM 377 Instrumental Analysis 2 (3 credits)
CHEM 381 Inorganic Chemistry 2 (3 credits)
CHEM 392 Integrated Inorganic/Organic Laboratory (3 credits)
CHEM 493 Advanced Physical Chemistry Laboratory (2 credits)
CHEM 470 Research Project 1 (6 credits)***
CHEM 574 Introductory Polymer Chemistry (3 credits)
MATH 222 Calculus 3 (3 credits) **
PHYS 242 Electricity and Magnetism (2 credits)

Complementary Courses (9 credits)

9 credits, three of:

* Students take either ANAT 542 or MIME 542.

ANAT 542 Transmission Electron Microscopy (3 credits) *
CHEM 462 Green Chemistry (3 credits)
CHEM 531 Chemistry of Inorganic Materials (3 credits)
CHEM 533 Small Molecule Crystallography (3 credits)
CHEM 534 Nanoscience and Nanotechnology (3 credits)
CHEM 571 Polymer Synthesis (3 credits)
CHEM 582 Supramolecular Chemistry (3 credits)
CHEM 585 Colloid Chemistry (3 credits)
MIME 260 Materials Science and Engineering (3 credits)
MIME 542 Transmission Electron Microscopy (3 credits) *
MATH 315 Ordinary Differential Equations

Attach extra page(s) as needed

8.0 Consultation with Related Units <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Financial Consult <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Attach list of consultations	

9. Approvals			
	Name	Signature	Date
Routing Sequence			
Department	<input type="text"/>	<input type="text"/>	<input type="text"/>
Curric/Acad Committee	<input type="text"/>	<input type="text"/>	<input type="text"/>
Faculty 1	<input type="text"/>	<input type="text"/>	<input type="text"/>
Faculty 2	<input type="text"/>	<input type="text"/>	<input type="text"/>
Faculty 3	<input type="text"/>	<input type="text"/>	<input type="text"/>
SCTP	<input type="text"/>	<input type="text"/>	<input type="text"/>
GS	<input type="text"/>	<input type="text"/>	<input type="text"/>
APPC	<input type="text"/>	<input type="text"/>	<input type="text"/>
Senate	<input type="text"/>	<input type="text"/>	<input type="text"/>
Submitted by			
Name	<input type="text" value="Amy S. Blum"/>	To be completed by ARR:	
Phone	<input type="text" value="514-398-6237"/>	CIP Code	
Email	<input type="text" value="amy.blum@mcaill.ca"/>	<input style="width: 100%;" type="text"/>	
Submission Date	<input type="text" value="Oct 18. 2013"/>		



<p>1.0 Degree Title Please specify the two degrees for concurrent degree programs</p> <p><input type="text" value="B.Sc."/></p> <p>1.1 Major (Legacy= Subject)(30-char. max.)</p> <p><input type="text" value="Major in Chemistry with Measurement Option"/></p> <p>1.2 Concentration (Legacy = Concentration/Option) If applicable to Majors only (30 char. max.)</p> <p><input type="text"/></p> <p>1.3 Minor (with Concentration, if Applicable) (30 char. max.)</p> <p><input type="text"/></p>	<p>2.0 Administering Faculty/Unit</p> <p><input type="text" value="Science/Chemistry"/></p> <p>Offering Faculty/Department</p> <p><input type="text" value="Science/Chemistry"/></p> <p>3.0 Effective Term of Implementation (Ex. Sept. 2004 = 200409) Term</p> <p><input type="text" value="201509"/></p>
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4.0 Rationale and Admission Requirements for New Proposal

Although the Chemistry Department has several program options, none currently target students interested in physics or analytical chemistry, The proposed program is to fill this hole in our offerings. This new program has been formulated in response to student requests. Over the last decade, there has been a larger emphasis on synthesis in our other program offerings with a decreased emphasis on numerical and instrumental offerings. This new program offers an option for chemistry students who are more interested in non-synthetic aspects of chemistry.

5.0 Program Information
Please check appropriate box(es)

<p>5.1 Program Type</p> <p><input checked="" type="checkbox"/> Bachelor's Program</p> <p><input type="checkbox"/> Master's</p> <p><input type="checkbox"/> M.Sc. (Applied) Program</p> <p><input type="checkbox"/> Dual Degree/Concurrent Program</p> <p><input type="checkbox"/> Certificate</p> <p><input type="checkbox"/> Diploma</p> <p><input type="checkbox"/> Graduate Certificate</p> <p><input type="checkbox"/> Graduate Diploma</p> <p><input type="checkbox"/> Ph.D. Program</p> <p><input type="checkbox"/> Doctorate Program (Other than Ph.D.)</p> <p><input type="checkbox"/> Private Program</p> <p><input type="checkbox"/> Off-Campus Program</p> <p><input type="checkbox"/> Distance Education Program (By Correspondence)</p> <p><input type="checkbox"/> Other (Please specify)</p>	<p>5.2 Category</p> <p><input type="checkbox"/> Faculty Program (FP)</p> <p><input checked="" type="checkbox"/> Major</p> <p><input type="checkbox"/> Joint Major</p> <p><input type="checkbox"/> Major Concentration (CON)</p> <p><input type="checkbox"/> Minor</p> <p><input type="checkbox"/> Minor Concentration (CON)</p> <p><input type="checkbox"/> Honours (HON)</p> <p><input type="checkbox"/> Joint Honours Component (HC)</p> <p><input type="checkbox"/> Internship/Co-op</p> <p><input type="checkbox"/> Thesis (T)</p> <p><input type="checkbox"/> Non-Thesis (N)</p> <p><input type="checkbox"/> Other</p> <p><input type="checkbox"/> Please specify</p> <p><input type="text"/></p>	<p>5.3 Level</p> <p><input checked="" type="checkbox"/> Undergraduate</p> <p><input type="checkbox"/> Dentistry/Law/Medicine</p> <p><input type="checkbox"/> Continuing Studies (Non-Credit)</p> <p><input type="checkbox"/> Collegial</p> <p><input type="checkbox"/> Masters & Grad Dips & Certs</p> <p><input type="checkbox"/> Doctorate</p> <p><input type="checkbox"/> Post-Graduate Medicine/Dentistry</p> <p><input type="checkbox"/> Graduate Qualifying</p> <p><input type="checkbox"/> Postdoctoral Fellows</p> <p>5.4 FQRSC (Research) Indicator (for GPS) Yes No</p>
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<p>6.0 Total Credits</p> <p><input type="text" value="62"/></p>	<p>7.0 Consultation with Related Units Yes <input type="checkbox"/> No</p> <p>Financial Consult Yes <input type="checkbox"/> No</p> <p>Attach list of consultations.</p> <p><input type="checkbox"/></p>
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<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8.0 Program Description (Maximum 150 words)

This is a B.Sc. program in chemistry with an emphasis on additional background and advanced courses of interest to physical and analytical chemists.

9.0 List of proposed program for the New Program/Major or Minor/Concentration.

Proposed program (list courses as follows: Subj Code/Crse Num, Title, Credit weight under the headings of: Required Courses, Complementary Courses, Elective Courses)

Program Requirements

PRE-PROGRAM REQUIREMENTS:

Students entering from the Freshman program must have included CHEM 110 and CHEM 120 or CHEM 115, BIOL 111 or BIOL 112, MATH 133, MATH 140/MATH 141 or MATH 150/MATH 151, PHYS 131/PHYS 142, or their equivalents in their Freshman year. Quebec students must have completed the DEC with appropriate science and mathematics courses. Note that students who have successfully completed MATH 150 and MATH 151 do not have to take MATH 222.

Required Courses (59 credits)

The required courses in this program consist of 59 credits in chemistry, physics and mathematics, listed below. The courses marked with an asterisk (*) are omitted from the program of students who have successfully completed them at the CEGEP level. Students completing this program will not be eligible for admission to the Ordre des chimistes du Québec without additional chemistry electives. This program is not currently accredited by the Canadian Society for Chemistry. See <http://www.chemistry.mcgill.ca/advising/inside/advisors.php>.

Completion of Mathematics MATH 222 and MATH 315 during U1 is strongly recommended.

* Denotes courses with CEGEP equivalents.

** Students who have successfully completed MATH 150 and MATH 151 are not required to take MATH 222.

CHEM 212 Introductory Organic Chemistry 1 (4 credits) *
CHEM 222 Introductory Organic Chemistry 2 (4 credits) *
CHEM 223 Introductory Physical Chemistry 1 (2 credits)
CHEM 243 Introductory Physical Chemistry 2 (2 credits)
CHEM 283 Introductory Physical Chemistry Laboratory (2 credits)
CHEM 281 Inorganic Chemistry 1 (3 credits)
CHEM 287 Introductory Analytical Chemistry (2 credits)
CHEM 297 Introductory Analytical Chemistry Laboratory (1 credit)
CHEM 302 Introductory Organic Chemistry 3 (3 credits)
CHEM 345 Molecular Properties and Structure 1 (3 credits)
CHEM 355 Molecular Properties and Structure 2 (3 credits)
CHEM 365 Statistical Thermodynamics (2 credits)
CHEM 367 Instrumental Analysis 1 (3 credits)
CHEM 377 Instrumental Analysis 2 (3 credits)
CHEM 381 Inorganic Chemistry 2 (3 credits)
CHEM 493 Advanced Physical Chemistry Laboratory (2 credits)
CHEM 575 Chemical Kinetics (3 credits)
MATH 222 Calculus 3 (3 credits) **
MATH 223 Linear Algebra (3 credits)
MATH 315 Ordinary Differential Equations (3 credits)
COMP 208 Computers in Engineering (3 credits)
PHYS 241 Signal Processing (3 credits)
PHYS 242 Electricity and Magnetism (2 credits)

Complementary courses (3 credits)

Choose one of:

CHEM 514 Biophysical Chemistry (3 credits)
CHEM 516 Nuclear and Radiochemistry (3 credits)
CHEM 531 Chemistry of Inorganic Materials (3 credits)
CHEM 533 Small Molecule Crystallography (3 credits)
CHEM 534 Nanoscience and Nanotechnology (3 credits)
CHEM 547 Laboratory Automation (3 credits)
CHEM 555 NMR Spectroscopy (3 credits)
CHEM 556 Quantum Chemistry (3 credits)
CHEM 567 Chemometrics: Data Analysis (3 credits)
CHEM 577 Electrochemistry (3 credits)
CHEM 585 Colloid Chemistry (3 credits)
CHEM 593 Statistical Mechanics (3 credits)
CHEM 597 Spectroscopy (3 credits)

10.0 Approvals

Routing Sequence	Name	Signature	Date
Department	<input type="text"/>	<input type="text"/>	<input type="text"/>
Curric/Acad Committee	<input type="text"/>	<input type="text"/>	<input type="text"/>
Faculty 1	<input type="text"/>	<input type="text"/>	<input type="text"/>
Faculty 2	<input type="text"/>	<input type="text"/>	<input type="text"/>
Faculty 3	<input type="text"/>	<input type="text"/>	<input type="text"/>
CGPS	<input type="text"/>	<input type="text"/>	<input type="text"/>
SCTP	<input type="text"/>	<input type="text"/>	<input type="text"/>
APC	<input type="text"/>	<input type="text"/>	<input type="text"/>
Senate	<input type="text"/>	<input type="text"/>	<input type="text"/>

Submitted by

Name

To be completed by ARR:

Phone

CIP Code

Email

Submission Date



<p>1.0 Degree Title Please specify the two degrees for concurrent degree programs</p> <p><input type="text" value="B.Sc."/></p> <p>1.1 Major (Legacy= Subject)(30-char. max.)</p> <p><input type="text" value="Honours in Chemistry with Measurement Option"/></p> <p>1.2 Concentration (Legacy = Concentration/Option) If applicable to Majors only (30 char. max.)</p> <p>1.3 Minor (with Concentration, if Applicable) (30 char. max.)</p> <p><input type="text"/></p>	<p>2.0 Administering Faculty/Unit</p> <p><input type="text" value="Science/Chemistry"/></p> <p>Offering Faculty/Department</p> <p><input type="text" value="Science/Chemistry"/></p> <p>3.0 Effective Term of Implementation (Ex. Sept. 2004 = 200409) Term</p> <p><input type="text" value="201509"/></p>
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4.0 Rationale and Admission Requirements for New Proposal

Although the Chemistry Department has several program options, none currently target students interested in physical or analytical chemistry. The proposed program is to fill this hole in our offerings. This new program has been formulated in response to student requests. Over the last decade, there has been a larger emphasis on synthesis in our other program offerings with a decreased emphasis on numerical and instrumental offerings. This new program offers an option for chemistry students who are more interested in non-synthetic aspects of chemistry.

5.0 Program Information
Please check appropriate box(es)

<p>5.1 Program Type</p> <p><input checked="" type="checkbox"/> Bachelor's Program</p> <p><input type="checkbox"/> Master's</p> <p><input type="checkbox"/> M.Sc. (Applied) Program</p> <p><input type="checkbox"/> Dual Degree/Concurrent Program</p> <p><input type="checkbox"/> Certificate</p> <p><input type="checkbox"/> Diploma</p> <p><input type="checkbox"/> Graduate Certificate</p> <p><input type="checkbox"/> Graduate Diploma</p> <p><input type="checkbox"/> Ph.D. Program</p> <p><input type="checkbox"/> Doctorate Program (Other than Ph.D.)</p> <p><input type="checkbox"/> Private Program</p> <p><input type="checkbox"/> Off-Campus Program</p> <p><input type="checkbox"/> Distance Education Program (By Correspondence)</p> <p><input type="checkbox"/> Other (Please specify)</p>	<p>5.2 Category</p> <p><input checked="" type="checkbox"/> Faculty Program (FP)</p> <p><input type="checkbox"/> Major</p> <p><input type="checkbox"/> Joint Major</p> <p><input type="checkbox"/> Major Concentration (CON)</p> <p><input type="checkbox"/> Minor</p> <p><input type="checkbox"/> Minor Concentration (CON)</p> <p><input checked="" type="checkbox"/> X Honours (HON)</p> <p><input type="checkbox"/> Joint Honours Component (HC)</p> <p><input type="checkbox"/> Internship/Co-op</p> <p><input type="checkbox"/> Thesis (T)</p> <p><input type="checkbox"/> Non-Thesis (N)</p> <p><input type="checkbox"/> Other</p> <p><input type="checkbox"/> Please specify</p> <p><input type="text"/></p>	<p>5.3 Level</p> <p><input checked="" type="checkbox"/> Undergraduate</p> <p><input type="checkbox"/> Dentistry/Law/Medicine</p> <p><input type="checkbox"/> Continuing Studies (Non-Credit)</p> <p><input type="checkbox"/> Collegial</p> <p><input type="checkbox"/> Masters & Grad Dips & Certs</p> <p><input type="checkbox"/> Doctorate</p> <p><input type="checkbox"/> Post-Graduate Medicine/Dentistry</p> <p><input type="checkbox"/> Graduate Qualifying</p> <p><input type="checkbox"/> Postdoctoral Fellows</p> <p>5.4 FQRSC (Research) Indicator (for GPS) Yes No</p>
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<p>6.0 Total Credits</p> <p><input type="text" value="74"/></p>	<p>7.0 Consultation with Related Units Yes <input type="checkbox"/> No</p> <p>Financial Consult Yes No</p> <p>Attach list of consultations.</p>
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<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8.0 Program Description (Maximum 150 words)

This is a B.Sc. Honours program in chemistry with an emphasis on additional background and advanced courses of interest to physical and analytical chemists.

9.0 List of proposed program for the New Program/Major or Minor/Concentration.

Proposed program (list courses as follows: Subj Code/Crse Num, Title, Credit weight under the headings of: Required Courses, Complementary Courses, Elective Courses)

Program Requirement:

Note: Attainment of the Honours degree requires a CGPA of at least 3.00.

Program Prerequisites

PRE-PROGRAM REQUIREMENTS:

Students entering from the Freshman program must have included CHEM 110 and CHEM 120 or CHEM 115, BIOL 111 or BIOL 112, MATH 133, MATH 140/MATH 141 or MATH 150/MATH 151, PHYS 131/PHYS 142, or their equivalents in their Freshman year. Quebec students must have completed the DEC with appropriate science and mathematics courses. Note that students who have successfully completed MATH 150 and MATH 151 do not have to take MATH 222.

Required Courses (59 credits)

The required courses in this program consist of 59 credits in chemistry, physics and mathematics, listed below. The courses marked with an asterisk (*) are omitted from the program of students who have successfully completed them at the CEGEP level. Students completing this program will not be eligible for admission to the Ordre des chimistes du Québec without additional chemistry electives. This program is not currently accredited by the Canadian Society for Chemistry. See <http://www.chemistry.mcgill.ca/advising/inside/advisors.php>.

Completion of Mathematics MATH 222 and MATH 315 during U1 is strongly recommended.

* Denotes courses with CEGEP equivalents.

** Students who have successfully completed MATH 150 and MATH 151 are not required to take MATH 222.

CHEM 212 Introductory Organic Chemistry 1 (4 credits) *
CHEM 222 Introductory Organic Chemistry 2 (4 credits) *
CHEM 223 Introductory Physical Chemistry 1 (2 credits)
CHEM 243 Introductory Physical Chemistry 2 (2 credits)
CHEM 283 Introductory Physical Chemistry Laboratory (2 credits)
CHEM 281 Inorganic Chemistry 1 (3 credits)
CHEM 287 Introductory Analytical Chemistry (2 credits)
CHEM 297 Introductory Analytical Chemistry Laboratory (1 credit)
CHEM 302 Introductory Organic Chemistry 3 (3 credits)
CHEM 345 Molecular Properties and Structure 1 (3 credits)
CHEM 355 Molecular Properties and Structure 2 (3 credits)
CHEM 365 Statistical Thermodynamics (2 credits)
CHEM 367 Instrumental Analysis 1 (3 credits)
CHEM 377 Instrumental Analysis 2 (3 credits)
CHEM 381 Inorganic Chemistry 2 (3 credits)
CHEM 493 Advanced Physical Chemistry Laboratory (2 credits)
CHEM 575 Chemical Kinetics (3 credits)
MATH 222 Calculus 3 (3 credits) **
MATH 223 Linear Algebra (3 credits)
MATH 315 Ordinary Differential Equations (3 credits)
COMP 208 Computers in Engineering (3 credits)
PHYS 241 Signal Processing (3 credits)
PHYS 242 Electricity and Magnetism (2 credits)

Complementary courses (9 credits)

6 credits, choose two of:

CHEM 514 Biophysical Chemistry (3 credits)
CHEM 516 Nuclear and Radiochemistry (3 credits)
CHEM 531 Chemistry of Inorganic Materials (3 credits)
CHEM 533 Small Molecule Crystallography (3 credits)
CHEM 534 Nanoscience and Nanotechnology (3 credits)
CHEM 547 Laboratory Automation (3 credits)
CHEM 555 NMR Spectroscopy (3 credits)
CHEM 556 Quantum Chemistry (3 credits)
CHEM 567 Chemometrics: Data Analysis (3 credits)
CHEM 577 Electrochemistry (3 credits)
CHEM 585 Colloid Chemistry (3 credits)
CHEM 593 Statistical Mechanics (3 credits)
CHEM 597 Spectroscopy (3 credits)

9.0 List of proposed program for the New Program/Major or Minor/Concentration.

If new concentration (option) of existing Major/Minor (program), please attach a program layout (list of all courses) of existing Major/Minor.

Proposed program (list courses as follows: Subj Code/Crse Num, Title, Credit weight under the headings of: Required Courses, Complementary Courses, Elective Courses)

3 additional credits at the 400 or 500 level.

6 credits of research*:

* Students may take up to 12 Research Project credits but only 6 of these may be used to fulfil the program requirement.

- CHEM 470 Research Project 1 (6 credits)
- CHEM 480 Research Project 2 (3 credits)

Attach extra page(s) as needed

10.0 Approvals

Routing Sequence	Name	Signature	Date
Department	<input type="text"/>	<input type="text"/>	<input type="text"/>
Curric/Acad Committee	<input type="text"/>	<input type="text"/>	<input type="text"/>
Faculty 1	<input type="text"/>	<input type="text"/>	<input type="text"/>
Faculty 2	<input type="text"/>	<input type="text"/>	<input type="text"/>
Faculty 3	<input type="text"/>	<input type="text"/>	<input type="text"/>
CGPS	<input type="text"/>	<input type="text"/>	<input type="text"/>
SCTP	<input type="text"/>	<input type="text"/>	<input type="text"/>
APC	<input type="text"/>	<input type="text"/>	<input type="text"/>
Senate	<input type="text"/>	<input type="text"/>	<input type="text"/>

Submitted by

Name

To be completed by ARR:

Phone

CIP Code

Email

Submission Date

From: Amy Szuchmacher Blum, Dr.
Sent: November-21-14 3:12 PM
To: Josie D'Amico
Subject: Fwd: Re: consultation report: new chemistry program proposed

Sorry--I forgot to forward this one.

--Amy

----- Original Message -----

Subject:Re: consultation report: new chemistry program proposed

Date:11/21/2014 12:56 PM

From:Clark Verbrugge <clump@cs.mcgill.ca>

To:Amy Szuchmacher Blum, Dr. <amy.blum@mcgill.ca>

Hi Amy,

Yes, this looks fine, especially given the low numbers involved: we have no objections, or specific comments.

On 14-11-18 03:22 PM, Amy Szuchmacher Blum, Dr. wrote:

> Hello Clark,

>

> I was given your name as the contact for Computer Science from Josie D'Amico. In light of updates to the department's curriculum over the last several years, we are proposing a new program targeting undergrads interested in physical and/or analytical chemistry that de-emphasizes synthesis in favor of instrumentation, analytical and physical chemistry based courses. We would like to include COMP 208 as a required course for the program (see attached forms).

>

> We envision 5-8 students per year in this program, so we would expect that number to take COMP 208 if this is approved. My understanding is that we already send a handful of students to COMP 208 already, and that these are the students likely to be interested in this program. Could you please send comments in the next week or so?

>

> Thanks,

> Amy

>

--

tfn,

clark

clump@cs.mcgill.ca

From: Amy Szuchmacher Blum, Dr.
Sent: November-21-14 10:09 AM
To: Josie D'Amico
Subject: Fwd: Re: consultation report: new chemistry program proposed

This is the consultation from Math.

--Amy

----- Original Message -----

Subject: Re: consultation report: new chemistry program proposed

Date: 11/18/2014 3:37 PM

From: Vojkan Jaksic <jaksic@math.mcgill.ca>

To: Amy Szuchmacher Blum, Dr. <amy.blum@mcgill.ca>

CC: Vojkan Jaksic <jaksic@math.mcgill.ca>

Dear Amy,

this proposal is fine with Department of Mathematics and Statistics.

Best regards, Vojkan

> On Nov 18, 2014, at 3:18 PM, Amy Szuchmacher Blum, Dr.
> <amy.blum@mcgill.ca> wrote:

>

>

> Hello Vojkan,

>

> I was given your name as the contact for Math from Josie D'Amico. In light of updates to the department's curriculum over the last several years, we are proposing a new program targeting undergrads interested in physical and/or analytical chemistry that de-emphasizes synthesis in favor of instrumentation, analytical and physical chemistry based courses. We would like to include PHYS 241 and 242 as required courses for the program (see attached forms).

All of our students currently take MATH 222 and 315, so this shouldn't change things there. We envision 5-8 students per year in this program, so we would expect that number to take MATH 223 if this is approved. Could you please send comments in the next week or so?

>

> Thanks,

--Amy

>

> Dr. Amy Szuchmacher Blum

> Associate Professor

> McGill University

> Department of Chemistry

> 801 Sherbrooke Street West

> Montreal, QC H3A 0B8

> Canada

From: Amy Szuchmacher Blum, Dr.
Sent: November-21-14 10:08 AM
To: Josie D'Amico
Subject: Fwd: PHYS 241 and 334
Hi Josie,

This is the consultation from Physics.

--Amy

----- Original Message -----

Subject:PHYS 241 and 334

Date:11/20/2014 1:32 PM

From:Guy Moore <guymoore@hep.physics.mcgill.ca>

To:Amy Szuchmacher Blum, Dr. <amy.blum@mcgill.ca>

CC:Fritz Buchinger, Dr. <fritz.buchinger@mcgill.ca>

Hi Amy,

So I am getting back to you about your questions. First, regarding the proposed programs in Chemistry, I have spoken with the instructor of PHYS 241 (Signal Processing) and he feels that there is space in the class and it should not be a problem to accommodate a few more students. Regarding PHYS **242** (Electricity and Magnetism), it is strictly a service course for the Chemistry department, so of course we are fine with it being in the program, and in any case there will probably be no net effect on the enrollment. So the physics department is happy with these programs.

Regarding CHEM/PHYS 334: I have spoken with Peter Grutter, who originally developed the course jointly with Bruce Lennox. He felt that the change to a 400-level course is against the original spirit of the course as introduced at the time, which was to let students see some of the things going on in materials science before/without high level background. On the other hand, physics has not been involved in instructing the course since 2010, and very few physics students take the course, which is not in any physics program. If the role or nature of the course has evolved with time, that should be represented in its number and description. But at some level maybe there is not longer a good reason for it to be double listed. Would it make sense to make it just CHEM 4XX? [I will ask our nano people if they have strong feelings about this.]

guy

--

Guy D. Moore

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fax (514) 398-8434

e-mail guymoore@physics.mcgill.ca