

Supporting Documentation for New Major: Medicinal Chemistry

Need for program: Medicinal chemistry refers to the preparation of biologically active compounds, the study of their potency, and the understanding of their mechanism of action at the molecular level through the construction of structure-activity relationships. There are multiple compelling reasons for the creation of this new major, which include 1) an increasing number of job opportunities for medicinal chemists at the undergraduate level, 2) the growing demand for students to obtain discipline specific training at the undergraduate level, and 3) the recognition in academic and research communities of the importance of medicinal chemistry as a critical and thriving interdisciplinary field. We firmly believe that creation of the Medicinal Chemistry major will meet employer and student demand as well as solidify Virginia Tech as the destination for medicinal chemistry.

Whom the program will serve: The Chemistry degree program currently has approximately 200 students. We have identified within this cohort unique sets of students with interests that lie in different sub-fields of chemistry – materials/polymer, medicinal, inorganic, and computation. These students have expressed interest in receiving a more tailored degree program relevant to current career opportunities. The undergraduate degree in Medicinal Chemistry will equip graduates to seek employment as B.S. medicinal chemists in small biotech, small pharma, and large pharma. It will especially provide the graduates the broad skill set needed to conduct the multitude of tasks that entry-level medicinal chemists must perform, especially in small, entrepreneurial start-up firms. This degree will also provide an excellent foundation for graduates who wish to pursue biomedical professions and graduate school in chemistry, medicinal chemistry, pharmacology, or pharmaceutical science.

On the East Coast of the United States and Canada, only five universities currently offer undergraduate majors (or degrees) in Medicinal Chemistry, and there are no such programs within Virginia. Thus, introduction of a new B.S. major in Medicinal Chemistry could attract students from within the Commonwealth and across eastern North America to enroll at Virginia Tech. There is a particularly strong research emphasis on medicinal chemistry in the Department of Chemistry at Virginia Tech, and this expertise will richly inform undergraduate education in medicinal chemistry. Cross-campus linkages through the Virginia Tech Center for Drug Discovery (housed in Chemistry) will further enrich the program. There is also the potential to connect these students to the newly formed Virginia Tech Carilion School of Medicine, a strategic University initiative.

Resource needs: The Department of Chemistry is not requesting additional university resources to deliver the Medicinal Chemistry major, nor do we expect additional resources to be required in support areas such as University Libraries.

Administration: The Department of Chemistry within the College of Science at Virginia Tech will be the administrative home for the proposed degree program. We would like to have the major available for enrollment in Fall 2019 with some currently enrolled students graduating as early as 2021.

College of SCIENCE
Department of CHEMISTRY
Bachelor of Science in CHEMISTRY
Major in MEDICINAL CHEMISTRY
For students graduating in calendar year 2021

A dagger (†) indicates a course with prerequisites or co-requisites.
 These are detailed on the last page of this check-sheet.

I. Curriculum for Liberal Education (CLE) General Education Requirements (40 credits)
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Area 1: Writing and Discourse (6 credits). ENGL 1105-1106 satisfies the first-year writing requirement and is recommended. CHEM 4014 satisfies part of the chemistry ViEWS (Visual Expression, Writing and Speaking) requirement. Medicinal Chemistry majors may take three credits of Undergraduate Research, CHEM 4994(H), and make a poster presentation to satisfy the remaining ViEWS requirement within the Chemistry B. S. Degree. Other options for satisfying ViEWS are pursuing a second major, taking ENGL 3764 Technical Writing, and taking COMM 2004 Public Speaking.

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Area 2: Ideas, Cultural Traditions, and Values (6 credits).

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Area 3: Society and Human Behavior (6 credits). SOC 1004 and PSYC 1004 are recommended to students planning health sciences careers.

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Area 4: Scientific Reasoning and Discovery (8 credits). The following two course sequences are required of all students majoring in Medicinal Chemistry within the B.S. Degree in Chemistry.⁵

† PHYS 2205-2206 General Physics	3	
† PHYS 2215-2216 General Physics Laboratory	1	

3	
1	

3	
1	

Area 5: Quantitative and Symbolic Reasoning (8 credits). The following course sequence is required of all students majoring in Chemistry within the B.S. Degree in Chemistry.

† MATH 1225-1226 Calculus of a Single Variable		
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4	
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Area 6: Creativity and Aesthetic Experience (3 credits in one course selected from the CLE list).

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Area 7: Critical Issues in a Global Context (3 credits).

	3	
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II. Chemistry Bachelor of Science Core Courses (22 credits)

CHEM 1004 Chemistry First Year Experience	1			
† CHEM 1055-1056 General Chemistry for Majors	4		4	
† CHEM 1065-1066 General Chemistry for Major Laboratory ^{1,2}	1		1	
† CHEM 2565-2566 Principles of Organic Chemistry ³	3		3	
† CHEM 2154 Analytical Chemistry for Chemistry Majors	4			
† CHEM 2164 Analytical Chemistry for Chemistry Majors Lab	1			

III. Additional Required Courses for the Chemistry Bachelor of Science (8 credits)

† CHEM 2555-2556 Organic Synthesis & Techniques Laboratory ⁴	2		2	
† CHEM 4014 Survey of Chemical Literature	1			
† STAT 3005 Statistical Methods or † STAT 3615 Biological Statistics	3			

IV. Required Courses Specific to the Major in Medicinal Chemistry (19 credits)**

BIOL 1105,1106 Principles of Biology	3		3	
BIOL 1115,1116 Principles of Biology Laboratory	1		1	
† CHEM 4615-4616 Physical Chemistry for Life Sciences ⁶	3		3	
† CHEM 4544 Medicinal Chemistry Capstone Laboratory	2			
† CHEM 4584 Bioorganic Chemistry	3			

** MATH 1225-1226, PHYS 2205-2206, and PHYS 2215-2216 are also required of all Medicinal Chemistry Majors within the B.S. Degree in Chemistry. These courses are listed in Section I above.

V. Restricted Electives (6 credits)

Choose two of the following courses:

† CHEM 4524 Identification of Organic Compounds	3	
† CHEM 4514 Green Chemistry	3	
† CHEM 4554 Drug Chemistry	3	
† CHEM 4444 Bioinorganic Chemistry	3	
† CHEM 4424 / SBIO 4424 Polysaccharide Chemistry	3	

VI. Free Electives (25 credits)

Prerequisites

This checklist has no hidden prerequisites, although some of the courses listed are prerequisites for other courses. Please see your advisor or consult the Undergraduate Course Catalog for more information. Please note that Chemistry majors are expected to be “calculus-ready” upon the start of their curriculum.

Acceptable Substitutions

¹Prior credit for CHEM 1045 may be substituted for CHEM 1065.

²Prior credit for CHEM 1046 may be substituted for CHEM 1066.

³If a student has taken CHEM 2535 prior to adding a degree in chemistry, a minimum grade of “B” (3.0) or better is required to substitute CHEM 2535 as CHEM 2565.

⁴Since CHEM 2545-2546 does not satisfy the prerequisite for CHEM 2556 (due to training on specific instrumentation), if a student adds a CHEM BS degree after completing CHEM 2545-2546, two or more credits of CHEM 4994 may substitute for CHEM 2556 to meet the requirement.

⁵PHYS 2305 may be substituted for 2205/2215; PHYS 2306 may be substituted for 2206/2216.

⁶CHEM 3615 may be substituted for CHEM 4615; CHEM 3616 may be substituted for CHEM 4616.

Foreign Language Requirement

Students who did not successfully complete at least two years of a single foreign, classical, or sign language during high school must successfully complete six credit hours of a single foreign, classical, or sign language at the college level. Courses taken to meet this requirement do not count toward the hours required for graduates. Please consult the Undergraduate Catalog for details.

Satisfactory Progress Towards Degree and Minimum Grade Requirements

Upon having attempted 72 credits, student must have completed CHEM 1055-1056, CHEM 1065-1066, CHEM 1004, CHEM 2565-2566, CHEM 2555-2556, PHYS 2205/2215-2206/2216, and MATH 1225-1226.

Medicinal chemistry majors must maintain an in-major GPA of 2.0. If a medicinal chemistry major fails to meet this requirement for one academic term the student will be placed on Policy 91 (Satisfactory Progress Towards Degree) probation. Failure to meet the standard for two consecutive semesters will result in a Policy 91 suspension.

Medicinal chemistry majors must earn a grade of “C” or better in CHEM 1055, 1056, and 2565.

- If a medicinal chemistry major fails to earn a “C” or better in CHEM 1055, the student must either retake this class (and earn the minimum grade) **or** take CHEM 1035-1036, *General Chemistry* and earn a “B” or better in both semesters to remain in good standing for a chemistry degree and to enroll in CHEM 2565.
- If a medicinal chemistry major fails to earn a “C” or better in CHEM 2565, the student must either retake this class (and earn the minimum grade) **or** take CHEM 2535, *Organic Chemistry* and earn a “B” or better to remain in good standing for a chemistry degree and to enroll in CHEM 2566.

Graduation Requirements

Graduation requires completion of a minimum of 120 credit hours with a GPA of 2.0 or greater for all hours attempted. In addition, students must have an in-major GPA of 2.0 or greater counting all required chemistry courses and chemistry electives. The in-major CHEM GPA excludes Chemistry in Context (CHEM 1015, 1016, 1025, 1026), First-Year Experience (CHEM 1004), and Chemistry Problem Solving Skills (CHEM 2984). No more than 6 hours of CHEM 2974, 4974, and 4994 will be included in a student's in-major GPA.

Table of Pre-requisites and Co-requisites

Courses in this check-sheet marked with a dagger (†) have prerequisites or co-requisites.
These are detailed in the following table.

Check-sheet Course	Prerequisites and Co-requisites
PHYS 2205–2206	Pre: MATH 1016 or MATH 1016H or MATH 1025 or MATH 2015 or MATH 1026 or MATH 1205 or MATH 1205H or MATH 1525 or MATH 1535 or MATH 1225 or MATH 1225H for 2205; 2305 or 2205 for 2206
PHYS 2215–2216	Pre: 2215 or 2305 for 2216. Co: 2205 for 2215; 2206 for 2216
MATH 1225–1226	Pre: 1225 (C-) for 1226
CHEM 1055–1056	Co: MATH 1025 or 1225 and CHEM 1065 for 1055. Co: 1065 for 1055; 1066, 1066 for 1056
CHEM 2555–2556	Pre: 2565 for 2555; 2555 for 2556
CHEM 2154	Pre: 1036 or 1056 or 1056H. Co: 2164
CHEM 2164	Pre: 1046 or 1066. Co: 2154
CHEM 2565–2566	Pre: 1036 or 1056 or 1036H or 1056H for 2565; 2565 for 2566
CHEM 4014	Pre: Junior standing
STAT 3005	Pre: MATH 1205 or MATH 1225; Co: MATH 1206 or MATH 1226
STAT 3615	Pre: MATH 1205 or MATH 1225 or MATH 1025 or MATH 1525
BIOL 1115–1116	Co: 1105 for 1115; 1106 for 1116
CHEM 4615–4616	Pre: (1036 or 1056 or 1056H), (MATH 1026 or MATH 2015 or MATH 1226), (PHYS 2206 or PHYS 2306) for 4615; (1036 or 1056 or 1056H), (MATH 2016 or MATH 2024 or MATH 2224 or MATH 2204 or MATH 2204H or MATH 2214), (PHYS 2206 or PHYS 2306) for 4616
CHEM 4544	Pre: 4584, BIOL 1105, BIOL 1106
CHEM 4584	Pre: 2536 or 2566
CHEM 4524	Pre: (2536 or 2566), (3616 or 3616H or 4616)
CHEM 4514	Pre: 2536 or 2566
CHEM 4554	Pre: 2536 or 2566
CHEM 4444	Pre: (2566 or BCHM 4115), BIOL 1105, BIOL 1106
CHEM 4424	Pre: 2536 or 2566; course is cross-listed as SBIO 4424

BS in Chemistry: Major in Medicinal Chemistry 2022 Check-sheet – Changes from 2021

General education requirements (Section I) have transitioned from CLE to Pathways.

STAT 3005 or STAT 3615 is listed as a required General Education (Pathways) course in Section 1. Rather than list this requirement again in Section III, a note is added indicating that the requirement is encoded in Section I.

The number of free electives was reduced from 25 to 19 to ensure that the total number of credits in the degree is still 120.

**College of SCIENCE
 Department of CHEMISTRY
 Bachelor of Science in CHEMISTRY
 Major in MEDICINAL CHEMISTRY
 For students graduating in calendar year 2022**

A dagger (†) indicates a course with prerequisites or co-requisites.
 Prerequisites and co-requisites are tabulated on the last page of this check-sheet.

I. Pathways General Education Requirements (49 credits)
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Concept 1 Discourse (9 credits)

(1f): 6 credits in foundational courses. ENGL 1105-1106 is recommended.

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(1a): 3 credits in advanced or applied writing or speaking courses

	3	
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Concept 2 Critical Thinking in the Humanities (6 credits) PSYC 1004 and SOC 1004 are recommended to students contemplating careers in health sciences.

	3			3	
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Concept 3 Reasoning in the Social Sciences (6 credits)

	3			3	
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Concept 4 Reasoning in the Natural Sciences (8 credits). The following two course sequences are required of all students majoring in Medicinal Chemistry within the B.S. Degree in Chemistry.⁵

† PHYS 2205–2206 General Physics	3		† PHYS 2215–2216 General Physics Laboratory	3	
	1			1	

Concept 5 Quantitative and Computational Thinking (11 credits)

(5f): 6 credits in foundational courses. The following course sequence is required of all students majoring in Medicinal Chemistry within the B.S. Degree in Chemistry.

† MATH 1225–1226 Calculus of a Single Variable	4			4	
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(5a): 3 credits in advanced or applied courses. Students majoring in Medicinal Chemistry within the B.S. Degree in Chemistry must select either STAT 3005 (†) or STAT 3615 (†).

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Concept 6 Critique and Practice in Design and the Arts (6 credits = 3 in design + 3 in arts, or 6 in integrated design and arts)

	3			3	
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Concept 7 Critical Analysis of Identity and Equity in the United States (3 credits)

	3	
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II. Chemistry Bachelor of Science Degree Core Requirements (22 credits)

CHEM 1004 Chemistry First Year Experience	1			
† CHEM 1055–1056 General Chemistry for Majors	4		4	
† CHEM 1065–1066 General Chemistry for Major Laboratory ^{1,2}	1		1	
† CHEM 2565–2566 Principles of Organic Chemistry ³	3		3	
† CHEM 2154 Analytical Chemistry for Chemistry Majors	4			
† CHEM 2164 Analytical Chemistry for Chemistry Majors Lab	1			

III. Additional Required Courses for the Chemistry Bachelor of Science (5 credits)*

† CHEM 2555–2556 Organic Synthesis & Techniques Laboratory ⁴	2		2	
† CHEM 4014 Survey of Chemical Literature	1			

* All students completing a B.S. in Chemistry must complete either STAT 3005 Statistical Methods (†) or STAT 3615 Biological Statistics (†). This requirement is included in Section I above.

IV. Required Courses Specific to the Major in Medicinal Chemistry (19 credits)**

BIOL 1105,1106 Principles of Biology	3		3	
† BIOL 1115,1116 Principles of Biology Laboratory	1		1	
† CHEM 4615–4616 Physical Chemistry for Life Sciences ⁶	3		3	
† CHEM 4544 Medicinal Chemistry Capstone Laboratory	2			
† CHEM 4584 Bioorganic Chemistry	3			

** MATH 1225-1226 (†), PHYS 2205-2206 (†), and PHYS 2215-2216 (†) are also required of all Medicinal Chemistry Majors. These courses are listed in Section I above.

V. Restricted Electives (6 credits)

Choose two of the following courses:

† CHEM 4524 Identification of Organic Compounds	3			
† CHEM 4514 Green Chemistry	3			
† CHEM 4554 Drug Chemistry	3			
† CHEM 4444 Bioinorganic Chemistry	3			
† CHEM 4424 / SBIO 4424 Polysaccharide Chemistry	3			

VI. Free Electives (19 credits)

Prerequisites

This checklist has no hidden prerequisites, although some of the courses listed are prerequisites for other courses. Please see your advisor or consult the Undergraduate Course Catalog for more information. Please note that Chemistry majors are expected to be “calculus-ready” upon the start of their curriculum.

Acceptable Substitutions

¹Prior credit for CHEM 1045 may be substituted for CHEM 1065.

²Prior credit for CHEM 1046 may be substituted for CHEM 1066.

³If a student has taken CHEM 2535 prior to adding a degree in chemistry, a minimum grade of “B” (3.0) or better is required to substitute CHEM 2535 as CHEM 2565.

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Satisfactory Progress Towards Degree and Minimum Grade Requirements

Upon having attempted 72 credits, student must have completed CHEM 1055-1056, CHEM 1065-1066, CHEM 1004, CHEM 2565-2566, CHEM 2555-2556, PHYS 2205/2215-2206/2216, and MATH 1225-1226.

Medicinal chemistry majors must maintain an in-major GPA of 2.0. If a medicinal chemistry major fails to meet this requirement for one academic term the student will be placed on Policy 91 (Satisfactory Progress Towards Degree) probation. Failure to meet the standard for two consecutive semesters will result in a Policy 91 suspension.

Medicinal chemistry majors must earn a grade of “C” or better in CHEM 1055, 1056, and 2565.

- If a medicinal chemistry major fails to earn a “C” or better in CHEM 1055, the student must either retake this class (and earn the minimum grade) **or** take CHEM 1035-1036, *General Chemistry* and earn a “B” or better in both semesters to remain in good standing for a chemistry degree and to enroll in CHEM 2565.
- If a medicinal chemistry major fails to earn a “C” or better in CHEM 2565, the student must either retake this class (and earn the minimum grade) **or** take CHEM 2535, *Organic Chemistry* and earn a “B” or better to remain in good standing for a chemistry degree and to enroll in CHEM 2566.

Graduation Requirements

Graduation requires completion of a minimum of 120 credit hours with a GPA of 2.0 or greater for all hours attempted. In addition, students must have an in-major GPA of 2.0 or greater counting all required chemistry courses and chemistry electives. The in-major CHEM GPA excludes Chemistry in Context (CHEM 1015, 1016, 1025, 1026), First-Year Experience (CHEM 1004), and Chemistry Problem Solving Skills (CHEM 2984). No more than 6 hours of CHEM 2974, 4974, and 4994 will be included in a student's in-major GPA.

Table of Prerequisites and Co-requisites

Courses in this check-sheet marked with a dagger (†) have prerequisites or co-requisites.
Prerequisites and co-requisites are detailed in the following table.

Check-sheet Course	Prerequisites and Co-requisites
PHYS 2205–2206	Pre: MATH 1016 or MATH 1016H or MATH 1025 or MATH 2015 or MATH 1026 or MATH 1205 or MATH 1205H or MATH 1525 or MATH 1535 or MATH 1225 or MATH 1225H for 2205; 2305 or 2205 for 2206
PHYS 2215–2216	Pre: 2215 or 2305 for 2216. Co: 2205 for 2215; 2206 for 2216
MATH 1225–1226	Pre: 1225 (C-) for 1226
CHEM 1055–1056	Co: MATH 1025 or 1225 and CHEM 1065 for 1055. Co: 1065 for 1055; 1066, 1066 for 1056
CHEM 2555–2556	Pre: 2565 for 2555; 2555 for 2556
CHEM 2154	Pre: 1036 or 1056 or 1056H. Co: 2164
CHEM 2164	Pre: 1046 or 1066. Co: 2154
CHEM 2565–2566	Pre: 1036 or 1056 or 1036H or 1056H for 2565; 2565 for 2566
CHEM 4014	Pre: Junior standing
STAT 3005	Pre: MATH 1205 or MATH 1225; Co: MATH 1206 or MATH 1226
STAT 3615	Pre: MATH 1205 or MATH 1225 or MATH 1025 or MATH 1525
BIOL 1115–1116	Co: 1105 for 1115; 1106 for 1116
CHEM 4615–4616	Pre: (1036 or 1056 or 1056H), (MATH 1026 or MATH 2015 or MATH 1226), (PHYS 2206 or PHYS 2306) for 4615; (1036 or 1056 or 1056H), (MATH 2016 or MATH 2024 or MATH 2224 or MATH 2204 or MATH 2204H or MATH 2214), (PHYS 2206 or PHYS 2306) for 4616
CHEM 4544	Pre: 4584, BIOL 1105, BIOL 1106
CHEM 4584	Pre: 2536 or 2566
CHEM 4524	Pre: (2536 or 2566), (3616 or 3616H or 4616)
CHEM 4514	Pre: 2536 or 2566
CHEM 4554	Pre: 2536 or 2566
CHEM 4444	Pre: (2566 or BCHM 4115), BIOL 1105, BIOL 1106
CHEM 4424	Pre: 2536 or 2566; course is cross-listed as SBIO 4424



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October 1, 2018

Dear Colleagues,

The attached 2021 Checksheet for Medicinal Chemistry represents the establishment of a new major in the Bachelor of Science in Chemistry degree program. The new program will not require any additional resources.

Sincerely,

A handwritten signature in black ink that reads 'Alan Esker' in a cursive script.

Alan Esker

Chair and Professor of Chemistry



Eric de Sturler
Department of Mathematics
225 Stanger Street
McBryde Hall, Suite 460
Blacksburg, Virginia 24061-0123
P: (540) 231-5279 F: (540) 231-5960
sturler@vt.edu
<https://www.math.vt.edu/people/sturler>

Paul A. Deck
Associate Professor of Chemistry
Chair of Chemistry Undergraduate Education Committee
Virginia Tech

Re: Support for Inclusion of Math 1225 and Math 1226
in New Medicinal Chemistry Major

Dear Paul,

We agree that including Math 1225 and Math 1226 in the new Medicinal Chemistry major should not lead to substantial enrollment increases in these mathematics courses, since all current Chemistry majors are required to take these courses. Hence, the Department of Mathematics supports the inclusion of Math 1225 and Math 1226 without new resources. However, we will monitor the enrollments in these classes, and if we see a jump in enrollments we will begin discussions to get more resources or limit enrollment.

Sincerely,

A handwritten signature in blue ink that reads 'Eric de Sturler'. The signature is fluid and cursive, with a horizontal line drawn underneath it.

Eric de Sturler
Professor and Chair
Department of Mathematics

September 5, 2018

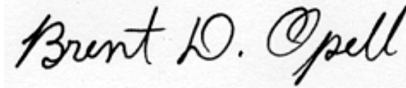
Dr. Paul Deck
Department of Chemistry

Dear Paul,

Biological Sciences supports your request to include BIOL 1105, 1106 Principles of Biology and BIOL 1115, 1116 Principles of Biology Laboratory as required courses for the proposed Medicinal Chemistry major.

Please be aware that availability of seats in each of these courses is dependent on sufficient resources from the College of Science and the University.

Yours sincerely,



Brent D. Opell
Chair, Curriculum Committee
Department of Biological Sciences

Subject: Re: Request for Support

From: Aaron Goldstein <goldst@vt.edu>

Date: 9/10/2018 12:56 PM

To: Paul Deck <pdeck@vt.edu>

Hi Paul -

I reviewed the checksheet and it looks like students would need to take Gen Chem and O Chem for majors (adds 4 credits) and an additional 9 courses (another 21 credits) for a double major (assuming that STAT 4604 would satisfy the statistics course requirement).

Perhaps CHE 4104 Process Materials (a CHE-required course) could be an alternative to CHE 4214 Introduction to Polymer Materials (a technical elective that may not be offered every year). That substitution would bring the additional load down to 8 additional courses (22 additional credits).

I'll get a copy of the CHE 4104 syllabus for you.

best wishes,

aaron

On Fri, Sep 7, 2018 at 11:02 PM, Paul Deck <pdeck@vt.edu> wrote:

Aaron,

I'm sharing with you a draft of the polymer chemistry checksheet (attached). It's not for wide distribution just yet. What I am hoping is that this major will be attractive to CHE undergraduates as a second major. That was part of my motivation for including your 4000-level polymer course as a restricted elective. Is there more we could do? For example we might be able to consider a substitution or two.

Paul

On 9/7/2018 8:46 PM, Aaron Goldstein wrote:

Hi Paul,

I can write a support letter on behalf of CHE.

Aaron

On Fri, Sep 7, 2018, 12:22 PM Paul Deck <pdeck@vt.edu> wrote:

Dear Profs. Goldstein, Fricker, Pitt, and Rogers:

The Chemistry Department seeks to diversify its undergraduate offerings through the implementation of two new majors (Medicinal Chemistry and Polymer Chemistry) within its Bachelor of Science in Chemistry degree program. Enrollments are always hard to predict with confidence, but we think we can realize perhaps 20 new enrollments per year in each of these new majors, once they are well established. We expect that perhaps half of these will be students who would otherwise have chosen allied degree programs at VT and would therefore have likely needed many of the same courses anyway.

We now request that you support our use of your course(s) in the manner tabulated below.

Should you have questions or require more information, please don't hesitate to call (1-3493) or write.

Many Thanks,

Paul A. Deck

Associate Professor of Chemistry and Chair of the Chemistry Department Undergraduate Education Committee

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Aaron S. Goldstein, Associate Professor
Assistant Department Head
Department of Chemical Engineering, and
School of Biomedical Engineering and Sciences
235 Kelly Hall
Stanger Street, Virginia Tech
Blacksburg, VA 24061-0298
540-231-3674, 540-231-5022 (fax)
aaron.goldstein@vt.edu

Subject: Re: Request for Support**From:** "Mark L. Pitt" <pitt@vt.edu>**Date:** 9/8/2018 7:46 AM**To:** Paul Deck <pdeck@vt.edu>**CC:** "Amanda J. Morris" <ajmorris@vt.edu>

Dear Paul,

The Department of Physics supports this. If you need a formal letter, please let me know.

Best regards,
Mark

On 9/7/18 12:22 PM, Paul Deck wrote:

Dear Profs. Goldstein, Fricker, Pitt, and Rogers:

The Chemistry Department seeks to diversify its undergraduate offerings through the implementation of two new majors (Medicinal Chemistry and Polymer Chemistry) within its Bachelor of Science in Chemistry degree program. Enrollments are always hard to predict with confidence, but we think we can realize perhaps 20 new enrollments per year in each of these new majors, once they are well established. We expect that perhaps half of these will be students who would otherwise have chosen allied degree programs at VT and would therefore have likely needed many of the same courses anyway.

We now request that you support our use of your course(s) in the manner tabulated below.

Should you have questions or require more information, please don't hesitate to call (1-3493) or write.

Many Thanks,

Paul A. Deck

Associate Professor of Chemistry and Chair of the Chemistry Department Undergraduate Education Committee

Polymer Chemistry Major	
Course	Role
MATH 1225-1226 & 2204	Major requirement; also Pathways 5f
PHYS 2305-2306	Major requirement; also Pathways 4
STAT 3005 and 3615	Major requirement, students will choose one; also Pathways 5a
CHE 4214	Restricted elective; requires Pre: CHE 2164
Medicinal Chemistry Major	
BIOL 1105, 1106, 1115, 1116	Major requirement
MATH 1225-1226	Major requirement
PHYS 2205-2206, 2215-2216	Major requirement
STAT 3005 and 3615	Major requirement, students will choose one; also Pathways 5a

Subject: Re: Request for Support

From: "Fricker, Ronald" <fricker@vt.edu>

Date: 9/10/2018 4:44 PM

To: "Deck, Paul" <pdeck@vt.edu>

Hi Paul,

That's fine. Let me know if you need a letter.

Best,
Ron

From: Paul Deck <pdeck@vt.edu>
Date: Monday, September 10, 2018 at 3:45 PM
To: "Fricker, Ronald" <fricker@vt.edu>
Subject: Re: Request for Support

Dear Ron,

I'd like to expand the list of STAT courses available to students in the *Polymer Chemistry* major to include STAT 4604 Statistical Methods for Engineers. (Or we could allow it as an acceptable substitution for students double-majoring in CHE.) My rationale is removing barriers to Chemical Engineering majors doing a second major in Polymer Chemistry. Since STAT 4604 is already a required course on the CHE checksheet, our use of STAT 4604 in this fashion should not change enrollment therein.

Thanks, Paul

On 9/7/2018 5:19 PM, Fricker, Ronald wrote:

Dear Paul,

The Department of Statistics supports this. Do you need a formal letter from me with the usual "no additional resources required" clause, or will this e-mail suffice?

Best,
Ron

From: Paul Deck <pdeck@vt.edu>
Date: Friday, September 7, 2018 at 12:22 PM
To: "Rogers, Robert" <rogers@vt.edu>, "Goldstein, Aaron" <goldst@vt.edu>, "Pitt, Mark" <pitt@vt.edu>, "Fricker, Ronald" <fricker@vt.edu>
Cc: "Morris, Amanda" <ajmorris@vt.edu>
Subject: Request for Support

Dear Profs. Goldstein, Fricker, Pitt, and Rogers:

The Chemistry Department seeks to diversify its undergraduate offerings through the implementation of two new majors (Medicinal Chemistry and Polymer Chemistry) within its Bachelor of Science in Chemistry degree program. Enrollments are always hard to predict with confidence, but we think we can realize perhaps 20 new enrollments per year in each of these new majors, once they are well established. We expect that perhaps half of these will be students who would otherwise have chosen allied degree programs at VT and would therefore have likely needed many of the same courses anyway.

We now request that you support our use of your course(s) in the manner tabulated below.

Should you have questions or require more information, please don't hesitate to call (1-3493) or write.

Many Thanks,

Paul A. Deck

Associate Professor of Chemistry and Chair of the Chemistry Department Undergraduate Education Committee

Polymer Chemistry Major	
Course	Role
MATH 1225-1226 & 2204	Major requirement; also Pathways 5f
PHYS 2305-2306	Major requirement; also Pathways 4
STAT 3005 and 3615	Major requirement, students will choose one; also Pathways 5a
CHE 4214	Restricted elective; requires Pre: CHE 2164
Medicinal Chemistry Major	
BIOL 1105, 1106, 1115, 1116	Major requirement
MATH 1225-1226	Major requirement
PHYS 2205-2206, 2215-2216	Major requirement
STAT 3005 and 3615	Major requirement, students will choose one; also Pathways 5a