Supporting Documentation for New Major: Polymer Chemistry

Need for program: Polymer chemistry refers to synthesis and characterization of organic macromolecules. Examples of the breadth and impact of polymer chemistry are all around us from the bottles that hold our water to the paint on the International Space Station. There are multiple compelling reasons for the creation of this new major, which include 1) interest from students to obtain discipline specific training at the undergraduate level, 2) the growing recognition from the field that polymer is a vital component to chemical education, and 3) an increasing number of job opportunities in polymer chemistry. We firmly believe that creation of the Polymer Chemistry major will meet employer and student demand as well as solidify Virginia Tech as the destination for polymer science.

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 Polymer Chemistry will position students to apply to many of the job opportunities available through companies that already recruit at Virginia Tech. This includes strategic partners such as Dow, 3M, and Owens Corning. Additionally, it will train students to apply to advanced degree programs in disciplines including chemistry, chemical engineering, biochemistry, or polymer (or macromolecular) science & engineering.

Whom the program will serve: To our knowledge there are only 4 undergraduate degree programs in Polymer Chemistry in the United States and no such programs within Virginia. Thus, introduction of a new B.S. major in Polymer Chemistry could attract students from within the Commonwealth and across North America to enroll at Virginia Tech. There is a particularly strong research emphasis on polymer chemistry in the Department of Chemistry at Virginia Tech, and this expertise will richly inform undergraduate education in polymer chemistry. Cross-campus linkage to the Macromolecules Innovation Institute and the American Chemical Society Polymer Division will further enrich the program. We anticipate that 10-20 students will declare the Polymer Chemistry major as soon as it become available. We also expect that within a few years the Polymer Chemistry major will have at least 40 entering students per year.

Resource needs: The Department of Chemistry is not requesting additional university resources to deliver the Polymer 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 POLYMER 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) Requirements (40 credits)

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. Polymer Chemistry majors may take three credits of Undergraduate Research, CHEM 4994(H), and make a poster presentation to satisfy the remaining ViEWS requirement within chemistry. Other options for satisfying ViEWS are pursuing a second major, taking ENGL 3764 Technical Writing, and taking COMM 2004 Public Speaking.

	3			3	

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

	3			3	

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

	3			3	

Area 4: Scientific Reasoning and Discovery (8 credits). The following course sequence is required of all students majoring in Polymer Chemistry within the B.S. Degree in Chemistry.

† PHYS 2305-2306 Foundations of Physics	4		4	

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

† MATH 1225-1226 Calculus of a Single Variable	4		4	

Area 6: Creativity and Aesthetic Experience (3 credits in <u>one course</u> selected from the CLE list).

	3	

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

	3	

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 Polymer Chemistry (12 credits)**

† MATH 2204 Introduction to Multivariable Calculus	3	
† CHEM 3615 Physical Chemistry[6]	3	
† CHEM 3625 Physical Chemistry Laboratory	1	
† CHEM 4534 Organic Chemistry of Polymers	3	
† CHEM 4074 / MSE 4544 Laboratory in Polymer Science	2	

** † MATH 1225-1226 and † PHYS 2305-2306 are also required of all Polymer Chemistry majors within the B.S. Degree Program in Chemistry. These courses are listed in Section I above.

V. Restricted Electives (9 credits)

Choose three of the following courses:

† CHEM 4524 Identification of Organic Compounds (Pre: 3616 or 4616)	3	
† CHEM 4634 / MSE 4534 Polymer and Surface Chemistry	3	
† CHEM 4424 / SBIO 4424 Polysaccharide Chemistry	3	
† CHE 4104 Process Materials (Pre: CHE 2164)	3	
† PHYS 4564 Polymer Physics	3	

VI. Free Electives (29 credits)

Prerequisites

This checksheet has no hidden prerequisites, although some of the courses listed are prerequisites for other courses. Courses marked with a dagger (†) have prerequisites; these are specified in the table on the following page. 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

[1]Prior credit for CHEM 1045 may be substituted for CHEM 1065.
[2]Prior credit for CHEM 1046 may be substituted for CHEM 1066.
[3]If 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.
[4]Since 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.
[5]STAT 4604 may be substituted for (STAT 3005 or STAT 3615).
[6]Credit for CHE 2164 may be substituted for CHEM 3615

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 2305-2306, and MATH 1225-1226.

Polymer chemistry majors must maintain an in-major GPA of 2.0. If a polymer 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.

Polymer Chemistry majors must earn a grade of "C" or better in CHEM 1055, 1056, and 2565.

- If a polymer 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 polymer 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. These are detailed in the following table.

Check-sheet Course	Pre-requisites and Co-requisites
PHYS 2305-2306	Pre: (MATH 1205 or MATH 1205H or MATH 1225) or (MATH 1206 or MATH 1206H or MATH 1226) for 2305; (MATH 1206 or MATH 1206H or MATH 1226), 2305 for 2306. Co: 2325 or (MATH 1206 or MATH 1206H or MATH 1226) for 2305
MATH 1225−1226	Pre: 1225 (C-) for 1226
CHEM 1055−1056	Co: 1065 for 1055; 1066 for 1056
CHEM 1065−1066	Co: 1055 for 1065; 1056 for 1066.
CHEM 2555-2556	Pre: 2565 for 2555; 2555 for 2556
CHEM 2565−2566	Pre: 1036 or 1056 or 1036H or 1056H for 2565; 2565 for 2566
CHEM 2154	Pre: 1036 or 1056 or 1056H. Co: 2164
CHEM 2164	Pre: 1046 or 1066. Co: 2154
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
MATH 2004	Pre: 1226.
CHEM 3615	Pre: (1035 or 1055 or 1055H), (1036 or 1056 or 1056H), PHYS 2306, (MATH 2204 or MATH 2204H or MATH 2224)
CHEM 3625	Pre: 3615 or 3615H or 4615
CHEM 4534	Pre: 2536 or 2566
CHEM 4524	Pre: (2536 or 2566), (3616 or 3616H or 4616)
CHEM 4634	Pre: 3615 or 4615; course is cross-listed with MSE 4534
CHEM 4074	Pre: 3616, 4534; course is cross-listed with MSE 4534
CHE 4104	Pre: 2164, (CHEM 2535 or CHEM 2565)
PHYS 4564	Pre: 2306
CHEM 4424	Pre: 2536 or 2566; course is cross-listed with SBIO 4424

BS in Chemistry: Major in Polymer Chemistry 2022 Checksheet – 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 29 to 23 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 POLYMER CHEMISTRY
For students graduating in calendar year 2022

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

I. Pathways General Education (49 credits)

Concept 1 Discourse (9 credits)

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

	3			3	

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

	3	

Concept 2 Critical Thinking in the Humanities (6 credits)

	3			3	

Concept 3 Reasoning in the Social Sciences (6 credits)

	3			3	

Concept 4 Reasoning in the Natural Sciences (8 credits). The following course sequence is required of all students majoring in Polymer Chemistry within the B.S. Degree in Chemistry.

† PHYS 2305-2306 Foundations of Physics	4		4	

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 Polymer Chemistry within the B.S. Degree in Chemistry.

† MATH 1225-1226 Calculus of a Single Variable	4		4	

(5a): 3 credits in advanced or applied courses. Students majoring in Polymer Chemistry within the B.S. Degree in Chemistry must select either STAT 3005 (†) or STAT 3615 (†).[5]

	3	

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	

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

	3	

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 (†).[5] This requirement is included in Section I above.

IV. Required Courses Specific to the Major in Polymer Chemistry (12 credits)**

† MATH 2204 Introduction to Multivariable Calculus	3	
† CHEM 3615 Physical Chemistry[6]	3	
† CHEM 3625 Physical Chemistry Laboratory	1	
† CHEM 4534 Organic Chemistry of Polymers	3	
† CHEM 4074 / MSE 4544 Laboratory in Polymer Science	2	

** MATH 1225-1226 and PHYS 2305-2306 are also required of all Polymer Chemistry majors within the B.S. Degree Program in Chemistry. These courses are listed in Section I above.

V. Restricted Electives (9 credits)

Choose three of the following courses:

† CHEM 4524 Identification of Organic Compounds (Pre: 3616 or 4616)	3	
† CHEM 4634 / MSE 4534 Polymer and Surface Chemistry	3	
† CHEM 4424 / SBIO 4424 Polysaccharide Chemistry	3	
† CHE 4104 Process Materials (Pre: CHE 2164)	3	
† PHYS 4564 Polymer Physics	3	

VI. Free Electives (23 credits)

Prerequisites

This checksheet 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

[1]Prior credit for CHEM 1045 may be substituted for CHEM 1065.
[2]Prior credit for CHEM 1046 may be substituted for CHEM 1066.
[3]If 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.
[4]Since 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.
[5]STAT 4604 may be substituted for (STAT 3005 or STAT 3615).
[6]Credit for CHE 2164 may be substituted for CHEM 3615

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 2305-2306, and MATH 1225-1226.

Polymer chemistry majors must maintain an in-major GPA of 2.0. If a polymer 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.

Polymer Chemistry majors must earn a grade of "C" or better in CHEM 1055, 1056, and 2565.

- If a polymer 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 polymer 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. These are detailed in the following table.

Check-sheet Course	Pre-requisites and Co-requisites
PHYS 2305-2306	Pre: (MATH 1205 or MATH 1205H or MATH 1225) or (MATH 1206 or MATH 1206H or MATH 1226) for 2305; (MATH 1206 or MATH 1206H or MATH 1226), 2305 for 2306. Co: 2325 or (MATH 1206 or MATH 1206H or MATH 1226) for 2305
MATH 1225−1226	Pre: 1225 (C-) for 1226
CHEM 1055−1056	Co: 1065 for 1055; 1066 for 1056
CHEM 1065−1066	Co: 1055 for 1065; 1056 for 1066.
CHEM 2555-2556	Pre: 2565 for 2555; 2555 for 2556
CHEM 2565−2566	Pre: 1036 or 1056 or 1036H or 1056H for 2565; 2565 for 2566
CHEM 2154	Pre: 1036 or 1056 or 1056H. Co: 2164
CHEM 2164	Pre: 1046 or 1066. Co: 2154
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
MATH 2004	Pre: 1226.
CHEM 3615	Pre: (1035 or 1055 or 1055H), (1036 or 1056 or 1056H), PHYS 2306, (MATH 2204 or MATH 2204H or MATH 2224)
CHEM 3625	Pre: 3615 or 3615H or 4615
CHEM 4534	Pre: 2536 or 2566
CHEM 4524	Pre: (2536 or 2566), (3616 or 3616H or 4616)
CHEM 4634	Pre: 3615 or 4615; course is cross-listed with MSE 4534
CHEM 4074	Pre: 3616, 4534; course is cross-listed with MSE 4534
CHE 4104	Pre: 2164, (CHEM 2535 or CHEM 2565)
PHYS 4564	Pre: 2306
CHEM 4424	Pre: 2536 or 2566; course is cross-listed with SBIO 4424

Department of Chemistry
1040 Drillfield Drive
Davidson Hall 480
Blacksburg, Virginia 24061
P: (540) 231-8251
F: (540) 231-3255
Email: aesker@vt.edu

October 1, 2018

Dear Colleagues,

The attached 2021 Checksheet for Polymer 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,

Alan Esker

Alan Esker
Chair and Professor of Chemistry

VIRGINIA TECH

College of Science

Brent Opell, Ph.D.
Department of Biological Sciences
Derring Hall Room 2104 926 West Campus Drive
Blacksburg, Virginia 24061
(540) 231-7445 Fax: (540) 231-9307
E-mail: bopell@vt.edu
www.biol.vt.edu

September 5, 2018

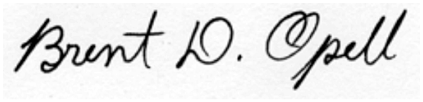
Dr. Paul Deck
Department of Chemistry

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

--

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

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, Math 1226 and Math 2204
in New Polymer Chemistry Major

Dear Paul,

We agree that including Math 1225, Math 1226, and Math 2204 in the new Polymer 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, Math 1226, and Math 2204 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,

Eric de Sturler
Professor and Chair
Department of Mathematics

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