

July 11, 2018

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I am writing on behalf of the chemistry department to solicit approval for the following changes to its program:

1. Modification of the Advanced analytical Chemistry (CHM 122) course by
  - a. Adding a unit to the course
  - b. Adding one 50-minute lecture period to the course
  - c. Renaming the course "Advanced Methods in Chemistry" and changing its catalogue description to reflect the above changes:

**CHM 122 Advanced Methods in Chemistry (3)** Prerequisites: CHM 101 and CHM 121 or consent of instructor. Two lectures and one four-hour laboratory per week. An advanced integrated laboratory course that develops students proficiency with the use of advanced synthetic and instrumental methods and their application to small molecule, metallurgical, polymeric, nanoscale, food, and environmental systems. Laboratory work focus on the selection, design and implementation of instrumental and wet chemical methods and the development of problem solving, troubleshooting, scientific information literacy, and professional communication skills.

2. Addition of one unit to the Professional, General, and Chemical Physics Chemistry B.S. tracks (Programs A, B, and D) requirements in support of the above.
3. Modification of our 3-2 Chemical Engineering B.A. track to reflect changes that have taken place in our department over the last ten years, specifically:
  - a. Replacing the requirement for CHM 125 *Analog and Digital Instrumental Analysis*, a course we do not regularly offer, with the substantially equivalent PHY 142 *Circuits and Electronics* and PHY 143 *Circuits & Electronics Lab*. Alternatively, we would be amenable to a cross-listing of the two courses.
  - b. Removal of the CHM 122 requirement to reflect that the needed material was moved into the already-required CHM 121 course last year.

We are able to enhance our program through these changes as a beneficial side effect of the curricular changes passed by the senate last year. We do not foresee these changes as having a significant impact on faculty loads or the ability of students to complete our programs; the third change should even make it easier for 3-2 chemical engineering students to better prepare for their engineering programs. Additional information about these changes is provided in the attached rationale documents and sample syllabi.

Stephen M. Contakes  
Signing on behalf of the department



## Rationale for modifying the Advanced Analytical Chemistry (CHM 122) Course; Programs A, B, and D of the Chemistry B.S. Degree tracks; and the B.A. 3-2 Chemical Engineering Degree Track

The chemistry department seeks approval for the following changes to its program:

- Modification of the Advanced analytical Chemistry (CHM 122) course by
  - Adding a unit to the course
  - Adding one 50-minute lecture period to the course (technically two 50-minute periods relative to how we currently schedule the course).
  - Renaming the course “Advanced Methods in Chemistry” and changing its catalogue description to reflect the above changes:  
**CHM 122 Advanced Methods in Chemistry (3).** Prerequisites: CHM 101 and CHM 121 or consent of instructor. Two lectures and one four-hour laboratory per week. An advanced integrated laboratory course that develops students proficiency with the use of advanced synthetic and instrumental methods and their application to small molecule, metallurgical, polymeric, nanoscale, food, and environmental systems. Laboratory work focus on the selection, design and implementation of instrumental and wet chemical methods and the development of problem solving, troubleshooting, scientific information literacy, and professional communication skills.
- Addition of one unit to the Professional, General, and Chemical Physics Chemistry B.S. tracks (Programs A, B, and D) requirements in support of the above change.
- Modification of our 3-2 Chemical Engineering B.A. track to reflect changes that have taken place in our department over the last ten years. Specifically, we ask for the
  - Replacing the requirement for CHM 125 *Analog and Digital Instrumental Analysis*, a course we do not regularly offer, with the substantially equivalent PHY 142 *Circuits and Electronics* and PHY 143 *Circuits & Electronics Lab*. Alternatively, we would be amenable to a cross-listing of the two courses.
  - Removal of the CHM 122 requirement to reflect that the needed material was moved into the already-required CHM 121 course last year.
- Reduction of one unit in the Chemical Engineering 3-2 B.A. in chemistry track requirements in support of the above change.

We request these changes for the following reasons:

**The proposed changes to the CHM 122 course** will accomplish two main goals:

1. They will allow us to add a small amount of additional materials and nanochemistry-related content that reflect current trends in how the chemical sciences have developed over the past 20 years.
2. The additional lecture period and unit will align the course with the credit and meeting time expectations for an “in-depth course” under the current American Chemical Society accreditation expectations.

**The additional unit for the Chemistry B.S. tracks** is requested in support of the changes to the CHM 122 course. Since we are cognizant of the already high workload faced by these students we would like to note the following about the projected impact of this change on our students:

- Students will still be able to complete all but one of our programs in four years with no advanced placement or transfer credit and with a study abroad experience for a single semester. The only exception is the four year B.A. fast track with teaching credential, which does not permit study abroad and is unaffected by the proposed change. See the sample programs in the Appendix for details.

- We do not think these changes will significantly impact our premed students or the number of students who are able to complete a double major since the chemistry B.A. and biochemistry B.S. tracks will remain unaffected.
- We are cognizant that our programs already impose a high workload on students and plan on adding minimal additional content to the CHM 122 course. Syllabi for the existing and proposed CHM 122 course have been submitted alongside this application and may be consulted for details. The added content, highlighted in yellow, comprises one additional lab experiment and three short (30-minute) exams.

We further anticipate that this change will be cost neutral even though it will result in the addition of one unit of teaching load credit to the CHM 122 course. This is because the removal of CHM 122 from our biochemistry track (passed in the Fall of 2017) allows us to offer one less section of the CHM 122 course every fall in recompense, for a loss of three teaching load credits. Currently Professor Contakes, who previously taught the second section of CHM 122, is teaching one section of organic chemistry lab instead – a course that is worth two units of teaching load credits. In short, the changes enacted last year resulted in Professor Contakes losing one Fall teaching load credit. The current proposal simply involves us recovering that unit in the form of a strengthened CHM 122 course. In summary, the proposed changes do not impose additional faculty load beyond what the department is currently able to bear without the use of adjuncts.<sup>1</sup>

**The adjustments to our 3-2 chemical engineering B.A. in Chemistry track** are requested to adjust this program to reflect changes that have taken place in our department over the last ten years. Specifically,

- We wish to replace the requirement for CHM 125 *Analog and Digital Instrumental Analysis* with the substantially equivalent PHY 142 *Circuits and Electronics* and PHY 143 *Circuits & Electronics Lab*. We have not offered the CHM 125 course since Allan Nishimura retired in 2012 and currently have no plans for offering it in the immediate future. The PHY 142/143 combination is substantially identical to the prior CHM 125 course (and the two may even have been cross listed at one time). As such it is well-suited to the needs of a chemical engineering major.
- the removal of the CHM 122 requirement from the 3-2 chemical engineering B.A. track is requested since (a) it is no longer crucial for chemical engineering students to take CHM 122 since instrumental analysis is now part of the CHM 121 course and (b) it will provide a reduction in a unit to the track that 3-2 chemical engineering students can use for self-study in the areas of computer science, math, or physics in preparation for their anticipated engineering studies.

The requested changes will result in a one unit reduction in one unit of credit for our chemical engineering 3-2 track and make it possible for students in this track to study abroad. They also will not have any load credit implications since the 3-2 chemical engineering major is a seldom used track and we already offer the relevant courses at convenient times. A sample plan for the revised track is attached.

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<sup>1</sup> This conclusion is supported by our current load projections through 2022, although depending on how our sabbatical scheduling works in the future this change may occasionally result in our incurring 1-2 units of extra adjunct load in connection with some faculty sabbaticals.