UNIVERSITY OF WYOMING

College of Arts and Sciences
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29 July 2016

MEMO

TO: Kate Miller
Provost/VPAA

FROM: Paula M. Lutz
Dean, Arts and Sciences

RE: Program Review for Chemistry M.S.—Dean's recommendation

The M.S. in Chemistry has produced ten graduates in the past five years. An M.S. in Chemistry opens few additional career opportunities so student students are not recruited directly into this degree. This is the 'fall back' or 'default' degree program associated with the Ph.D. in Chemistry. Students are admitted to the Ph.D. program and occasionally decide for academic or personal reasons that they do not wish to finish. This usually occurs during the second year as coursework is being completed. Students are then given the option of the M.S.

This is truly a 'no-cost' program. Coursework offered is identical for all graduate students—there are no 'masters-specific' courses. The utility of this M.S. program is its link to the Ph.D., contributing to the flexibility of that program.

Based on the 'default' nature of this program and its 'no-cost', it is the recommendation of the Dean that the M.S. in Chemistry be maintained.

Academic Program Review
Report Template
University of Wyoming
Office of Academic Affairs
March 2016

(adapted from SDSU)

Title of Program/Specialization: Masters of Science/Chemistry
Indicate whether undergraduate or graduate program/specialization: Graduate
Department and College: Chemistry and Arts & Sciences
Department Head Name and contact information (phone, email): Professor David T. Anderson, (307) 766-2775, danderso@uwyo.edu

Part 1 – Program Review

1. **Program Demand*:**
   (*Note: If degrees granted exceeds cutoff, delay review until next round*.)
   a. Number of graduates over 5-year period: 10

Name	Graduation Year	Advisor	Degree
Justin Spott	Spring 2014	Roddick	MS
Cassandra Watts	Fall 2014	Roddick	MS
Mohammed Assiri	Fall 2014	Clennan	MS
Bhusan Thapaliya	Fall 2014	Roddick	MS
Ming Chen Tang	Fall 2014	Fan/Carron	MS
Nora Toruan	Summer 2014	Carron	MS
Mahmut Ruzi	Spring 2013	Anderson	MS
Jenna Milliken	Summer 2013	Carron	MS
Yuejiao Liu	Fall 2011	Parkinson	MS
Wesley Rodgers	Summer 2011	Basile	MS

   b. Enrollment in major/specialization over 5-year period: N/A

* Cutoffs for "Low Demand" Designation -- *Degrees Granted*

- Bachelor's Programs: Average – 5 per year; 5-year total: 25
- Master's Programs: Average – 3 per year; 5-year total: 15
- Ph.D. Programs: Average – 1 per year; 5-year total: 5

(See APPENDIX A for the types of programs that will be excluded from review.)

2. **Program Quality: Is the program of high quality?**
   a. Program accreditation
      i. For programs currently accredited include:
         1. Name of accrediting body/organization: American Chemical Society
         2. Date most recently accredited: 2015
         3. Next reaccreditation date: 2020
         4. List recommendations from most recent visit and progress to date. N/A

ii. For programs seeking accreditation include:
    1. Name of accrediting body/organization: N/A
    2. Timeline for seeking accreditation: N/A
iii. For all other programs include:
    1. Date of most recent Academic Program Review (APR): N/A
    2. List of recommendations from the most recent APR and progress to date. N/A

(Note: For first-time reviews, include N/A in response.)

b. Credentials of faculty
    i. Include a list of all faculty by name, highest degree and discipline of highest degree.

1. David T. Anderson	PhD	Chemistry
2. Navamoney Arulsamy	PhD	Chemistry
3. Franco Basile	PhD	Chemistry
4. Carla Beckett	MS	Chemistry
5. Edward Clennan	PhD	Chemistry
6. Robert Corcoran	PhD	Chemistry
7. Debashis Dutta	PhD	Chemical Engineering
8. Patricia Goodson	PhD	Chemistry
9. John Hoberg	PhD	Chemistry
10. Elliott Hulley	PhD	Chemistry
11. Jan Kubelka	PhD	Chemistry
12. Teresa Lehmann	PhD	Chemistry
13. Brian Leonard	PhD	Chemistry
14. Bruce Parkinson	PhD	Chemistry
15. Dean Roddick	PhD	Chemistry
16. Michael Sommer	PhD	Chemistry
17. Krisztina Varga	PhD	Chemistry
18. Jing Zhou	PhD	Chemistry

    ii. Also, include a breakdown by gender and ethnicity.

Male	13
Female	5
White	14
Hispanic	2
Indian	2

    iii. Grants awarded to academic personnel: Previous 5 years

Name	Years	Agency	Amount
David T. Anderson	2014-2017	NSF	$367,029
David T. Anderson	2009-2014	NSF	$431,583
Navamoney Arulsamy	2014-2015	WSGC	$14,750
Navamoney Arulsamy	2015-2016	UW OR	$2500
Franco Basile	2014-2017	NSF	$414,025
Carla Beckett			
Edward Clennan	2012-2016	NSF	$491,210

Edward Clennan	2014-2016	NSF	$19,600
Robert Corcoran	2016-2017	NIEHS	$16,000
Debashis Dutta	2014-2017	NIH	$334,497
Debashis Dutta	2014-2015	ITHS	$14,150
Debashis Dutta	2010-2015	NSF	$489,342
Patricia Goodson			
John Hoberg	2014-2017	NSF REU	$331,062
John Hoberg	2015-2016	UW, A&S	$2870
Elliott Hulley	2016-2019	PNNL	$3098
Jan Kubelka	2014-2017	NSF	$264,489
Teresa Lehmann	2013-2015	TIORCO	$371,614
Teresa Lehmann	2014-2017	NIH	$297,660
Brian Leonard	2014-2015	UW SER	$30,000
Brian Leonard	2013-2015	ACS-PRF	$100,000
Bruce Parkinson	2015-2018	NSF	$300,000
Bruce Parkinson	2014-2017	DOE-BES	$600,000
Bruce Parkinson	2008-2014	DOE-BES	$570,000
Dean Roddick	2012-2015	NSF	$431,000
Michael Sommer			
Krisztina Varga	2014-2017	NSF	$550,000
Krisztina Varga	2015-2017	INBRE	$50,000
Krisztina Varga	2014-2015	UW	$25,000
Jing Zhou	2012-2017	NSF	$506,000

iv. Grants submitted by academic personnel: Previous 5 years

v. Publications/presentations by academic personnel

Name	2015	2014	2013
1. David T. Anderson	4	3	5
2. Navamoney Arulsamy	6	4	1
3. Franco Basile	2	2	1
4. Carla Beckett	0	0	0
5. Edward Clennan	3	2	1
6. Robert Corcoran	0	0	0
7. Debashis Dutta	3	4	3
8. Patricia Goodson	0	0	0
9. John Hoberg	1	0	0
10. Elliott Hulley	1	0	----
11. Jan Kubelka	3	6	10
12. Teresa Lehmann	3	2	4
13. Brian Leonard	4	3	4
14. Bruce Parkinson	9	8	10
15. Dean Roddick	2	2	1
16. Michael Sommer	0	0	0
17. Krisztina Varga	1	1	2
18. Jing Zhou	4	2	2

vi. National/international award

vii. Other

c. Program reputation
   i. If program is ranked, include rank and by what organization.
      US News and World Report, #131, Ranked in 2014
   ii. Include a brief description of any other indicators of program reputation such as demand (e.g. waiting lists or over enrollment) for admission into program, employer data/feedback, etc.

      N/A

d. Curriculum of major or specialization
   i. Include a list of courses by prefix, number, title required in the major or specialization (do not include general education course unless required as part of the major requirements.)

      N/A

e. Distance delivery of program/major
   i. Note if the program is offered online and/or at one of the off-campus attendance centers (e.g., UW-Casper)

      No online or off-campus.

f. Quality of Assessment Plan/data
   i. Include a brief description of the program assessment plan and how the data are used to inform decisions related to program quality and student learning.

      We have graduate student learning outcomes that we assess on a yearly basis. We do not have an assessment plan just for our Masters degree.

g. Strategic Plan
   i. Include a brief description of any plans for the program or specialization that appear in the college/department strategic plan (i.e., facilities upgrades, curriculum changes, on-line or off-campus delivery, enrichment learning opportunities, etc.)

      Currently, the Master Degree in the chemistry program is part of our graduate program by which students decide either for (i) academic reasons or (ii) personal reasons to no longer pursue a graduate degree in chemistry are given the option to leave with a Master's in Science. This is primarily a so-called default Master's program and we <u>do not</u> recruit students directly into the Master's program. We decided to run it this way because 1) in chemistry a Master's degree does not open many additional career opportunities beyond a

BS degree, and 2) we decided it was not cost effective to run a Master's program.

h. Other:

3. **Mission Centrality: Does the program advance the mission of UW including institutional strategy?**
   a. Describe how the program supports the mission, vision and strategic goals of UW.

      The Master's degree program allows us greater flexibility to run our PhD program and thereby supports our mission to teach and perform research in chemistry.

   b. Describe how the program contributes to other programs across campus (i.e., general education courses, minor or support courses, interdisciplinary program, etc.)

      Master's students are teaching assistants in their first year and thereby help teach undergraduate chemistry laboratories.

   c. Include placement data for graduates and indicate if graduates are working in the field or not.

      N/A

   d. Describe the uniqueness or duplication of this program across the UW.

      There is no other program like this across campus.

   e. Other:

4. **Cost: Is the program financially viable?**
   a. Ratio of student credit hours per FTE

      N/A

   b. Direct instructional expenditures:
      i. Per student credit hour
      ii. Per total degrees awarded
      iii. Non-personnel expenditures per total academic FTE

         N/A

   c. Course enrollment
      i. Number of classes falling under University minimums
      ii. Lower-division courses falling under University minimums

         N/A

d. Other instructional cost drivers, such as:
    i. Section fill rates
    ii. Course completion rates
    iii. Curricular complexity
    iv. Faculty course load

e. Research expenditures per tenured/tenure-track FTE (and other academic personnel, where appropriate)

    N/A

f. Compare your data to national benchmarks (Delaware data)

g. Other:

Part II - Recommendations

Instructions: *After the review is completed, the Dean in consultation with the Department Head will select one of the following recommendations. In the justification, address each of the items associated with the recommendation.*

1) **Retain Due to Critical Need**
    a) A college may recommend that a degree program be retained due to its ability to fulfill a critical workforce need or shortage area for the state.

    b) Justification for retaining due to critical need must include:
        i) Explanation of why the program is important to the University/State/region
        ii) Description of specific steps (already taken and/or planned) to increase enrollment and graduate production;
        iii) Preliminary outcomes of steps taken.

2) **Retain with Further Review Required**
    a) A college may request that a program be retained for further review for those degree programs that serve a specific function central to the mission of the college or university.

b) Justification for retain due to further review must include:
   i) Explanation for how the program is central to the university's mission and the benefit to the system;
   ii) Description of specific steps (already taken and/or planned) to increase enrollment and graduate production;
   iii) Preliminary outcomes of steps taken.

3) **Consolidate with Another Program within College**
   a) A college may request that a program be consolidated with a similar program on campus that achieves similar degree requirements.

   b) Justification to consolidate with another program on campus must include:
      i) Explanation for how the degree requirements for the two programs warrant consolidation;
      ii) Evidence that the consolidation will meet graduate production thresholds, or specific steps to increase enrollment to meet production thresholds;
      iii) Preliminary outcomes of steps taken.

4) **Consolidate with Program(s) between Colleges/campuses (e.g., UW/C)**
   a) Two or more colleges may request that similar degree programs be consolidated to maintain equivalent degree programs.

   b) Justification for retaining due to cross-college consolidation must include:
      i) Explanation for how the consolidated programs will collaborate (e.g., sharing of required courses, shared faculty, etc.) to maintain graduate production thresholds;

      ii) Evidence that multi-college collaboration will meet graduate production thresholds, or specific steps to increase enrollment if merging programs fails to meet production thresholds;
      iii) Preliminary outcomes of collaboration between colleges.

5) **Terminate**
   a) A college may request that a program be terminated due to limited graduate production, lack of student interest, shifts in a given field of study, or continued declines in major enrollments.
   b) If the exigency for termination results from the program productivity review process then a brief justification to terminate a program should be included. Such a justification must include:
      i) Explanation for the decline in graduate production in the degree program;
      ii) Intended timeframe for submitting a program termination request to the Board of Trustees for their consideration;
      iii) Expected timeline to meet teach-out requirements established through the regional accrediting body.

APPENDIX A

"Low Productivity" Programs Excluded from Review Process

1) **Major Program Modifications**
   a) Degree programs that have undergone recent program modifications that adversely impact graduate production for a college.
   b) Modifications traditionally include programs that have undergone recent name changes during the reporting window that result in two equivalent degree programs.

2) **Program/Major Specializations**
   a) Degree programs that have one or more specializations which reduce the total number of graduates.
   b) The exclusion may apply only for those specializations where the combination results in graduate production that meets the establish threshold for the degree.

3) **Terminated Programs**
   a) Degree programs that have been inactivated during the reporting period, but still depict graduates that fall below the established thresholds.
   b) Terminated programs will remain on the Program Productivity Report until inactive

programs have completely cycled through the established reporting period.

4) **New Programs**
   a) Degree programs that have been activated within the past 7 years resulting in limited graduate production due to program implementation.
   b) Institutional review may be requested prior to the 7th year if graduate production is not scaling to the required thresholds for the degree level.

Academic Program Review: **Chemistry MS**

Section 8 – Cost

a) Ratio of student credit hours per FTE (AY 2014/15): **650.2**

b) Direct instructional expenditures (FY 2015): **$3,604,250**

i) Per student FTE: **$9,663**

ii) Per total degrees awarded: **$124,284**

iii) Non-personnel expenditures / total academic FTE: **$8,667**

c) Course enrollment (AY 2014/15)

i) Classes falling under university minimums: **5**

ii) Lower-division courses falling under university minimums: **0**

e) Research expenditure per tenure-track FTE (FY 2015): **$149,248**