

FORMAT 5

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PROGRAM/DEGREE REQUIREMENT CHANGE (MAJOR)

SUBMITTED BY:

| | | | |
|---------------|--|-----------------|-----------------|
| Department | Chemistry and Biochemistry | College/School | CNSM |
| Prepared by | William Simpson | Phone | 474-7235 |
| Email Contact | wrsimpson@alaska.edu | Faculty Contact | William Simpson |

See <http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures/> for a complete description of the rules governing curriculum & course changes.

PROGRAM IDENTIFICATION:

| | |
|--|-----------------------|
| DEGREE PROGRAM | Chemistry |
| Degree Level: (i.e., Certificate, A.A., A.A.S., B.A., B.S., M.A., M.S., Ph.D.) | M.A. and M.S. degrees |

A. CHANGE IN DEGREE REQUIREMENTS: (Brief statement of program/degree changes and objectives)

The department of Chemistry and Biochemistry is reorganizing its Masters programs such that the M.S. programs in Biochemistry and Molecular Biology and Environmental Chemistry will be concentrations within the Chemistry M.S. degree. Additionally, the department decided to require the GRE test for all M.S. students so we add that requirement to the M.S. degree (the M.A. degree does not have the GRE requirement).

B. CURRENT REQUIREMENTS AS IT APPEARS IN THE CATALOG:

CHEMISTRY

College of Natural Science and Mathematics Department of Chemistry and Biochemistry 907-474-5510
www.uaf.edu/chem/
 MA, MS Degrees

Minimum Requirements for Degrees: 30 credits

Graduates in chemistry qualify for employment in many fields as teachers of chemistry; supervisors in industry; technical sales personnel; research chemists in federal, state, municipal, academic or industrial laboratories; in pre-medicine; and as laboratory technicians. The rapid introduction of chemical techniques in all branches of commerce and the creation of many synthetic products have caused substantial growth in the profession. In addition to the traditional employment opportunities in chemistry, well-qualified graduates find positions in the fields of environmental sciences, oceanography and related interdisciplinary fields. Many recipients of chemistry master's degrees continue their education to obtain PhD degrees at other universities.

The department offers well-equipped laboratories housing instrumentation for nuclear magnetic resonance spectrometry, infrared, ultraviolet/visible, and atomic absorption spectrophotometry, mass spectrometry, gas chromatography, amino acid analysis and HPLC. Additional equipment for gas chromatography/mass spectrometry, x-ray diffractometry, electron microscopy and liquid scintillating counters is available in cooperation with other UAF departments and institutes.

MA Degree*

1. Complete the requirements for the MS degree in chemistry.
- * This is a non-thesis degree program. Substitute a research project (CHEM F698) for thesis.

MS Degree

1. Complete the general university requirements (page 202).
2. Complete the master's degree requirements (page 206).
3. Complete a research-based thesis.
4. Complete seminar2
5. Complete at least one semester of assisting in an undergraduate chemistry laboratory.
6. Minimum credits required30

See Biochemistry and Molecular Biology.
 See Environmental Chemistry.

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Dean's Office

College of Natural Science & Mathematics

C. PROPOSED REQUIREMENTS AS IT WILL APPEAR IN THE CATALOG WITH THESE CHANGES:

(Underline new wording ~~strike through old wording~~ and use complete catalog format)

CHEMISTRY

Governance
10/3/13 TLP

Minimum Requirements for Degrees: 30 credits

Graduates in chemistry qualify for employment in many fields as teachers of chemistry; supervisors in industry; technical sales personnel; research chemists in federal, state, municipal, academic or industrial laboratories; in pre-medicine; and as laboratory technicians. The rapid introduction of chemical techniques in all branches of commerce and the creation of many synthetic products have caused substantial growth in the profession. In addition to the traditional employment opportunities in chemistry, well-qualified graduates find positions in the fields of environmental sciences, oceanography, biochemistry, neuroscience, and related interdisciplinary fields. Many recipients of chemistry master's degrees continue their education to obtain PhD degrees at UAF or other universities. The M.S. program also has concentrations in the departmental focal areas of Biochemistry and Neuroscience and Environmental Chemistry. The department also offers Ph.D. degrees in each of these areas. See the "Biochemistry and Neuroscience" and "Environmental Chemistry" Ph.D. programs.

The department offers well-equipped laboratories housing instrumentation for nuclear magnetic resonance spectrometry, infrared, ultraviolet/visible, and atomic absorption spectrophotometry, mass spectrometry, gas chromatography, amino acid analysis and HPLC. Additional equipment for gas chromatography/mass spectrometry, x-ray diffractometry, electron microscopy and liquid scintillating counters is available in cooperation with other UAF departments and institutes.

MA Degree*

1. Complete the requirements for the MS degree in chemistry.
1. Complete the general university requirements (page 202).
2. Complete the master's degree requirements (page 206).
3. Note that only up to 6 credits of non-thesis research project may be applied towards degree credit requirements.
4. Minimum credits required.....30

* *This is a non-thesis degree program. Substitute a research project (CHEM F698) for thesis.*

MS Degree

1. Complete the following admission requirements
 - a) Submit GRE General Test scores
 - b) If English is not your native language, submit scores from both the Test of Spoken English and the Test of Written English, as well as TOEFL scores. Requests, including justification, for exceptions to this requirement should be made to the chair of the department.
- 1-2. Complete the general university requirements (page 202).
- 2-3. Complete the master's degree requirements (page 206).
- 3-4. Complete a research-based thesis.
- 4-5. Complete seminar (Chem F692).....2
- 5-6. Complete at least one semester of assisting in an undergraduate chemistry laboratory.
- 6-7. Minimum credits required30

Optional Concentrations: Biochemistry and Neuroscience, Environmental Chemistry

MS Degree -- Biochemistry and Neuroscience concentration

1. Complete the following admission requirements
 - a) Submit GRE General Test scores
 - b) If English is not your native language, submit scores from both the Test of Spoken English and the Test of Written English, as well as TOEFL scores. Requests, including justification, for exceptions to this requirement should be made to the chair of the department.
2. Complete the general university requirements (page 202).
3. Complete the master's degree requirements (page 206).
4. Complete 3 courses from the following list:

| | |
|---|----------|
| <u>CHEM F654—Protein Structure and Function.....</u> | <u>3</u> |
| <u>CHEM F657—Molecular Foundations of Gene Expression</u> | <u>3</u> |
| <u>CHEM F674—Membrane Biochemistry and Biophysics</u> | <u>3</u> |
| <u>CHEM F670-Cellular and Molecular Neuroscience.....</u> | <u>3</u> |
| <u>CHEM F675-Cellular Signaling.....</u> | <u>3</u> |
5. Complete a research thesis.
6. Minimum credits required30

MS Degree -- Environmental Chemistry concentration

1. Complete the following admission requirements
 - a) Submit GRE General Test scores
 - b) If English is not your native language, submit scores from both the Test of Spoken English and the Test of Written English, as well as TOEFL scores. Requests, including justification, for exceptions to this requirement should be made to the

chair of the department.

2. Complete the general university requirements (page 202).

3. Complete the master's degree requirements (page 206).

4. Complete two of the courses from the following list:

CHEM F605—Aquatic Chemistry.....3

CHEM F606—Atmospheric Chemistry3

CHEM F631—Environmental Fate and Transport.....3

CHEM F655 – Environmental Toxicology.....3

5. Complete two seminar courses

CHEM F691—Research Presentation Techniques.....1

CHEM F692—Seminar.....1

6. Complete approved electives*.....3-6

7. Complete a research thesis.12

8. Minimum credits required30

Approved electives are specified by the student's committee. The following tracks are defined as a guide. Within these tracks students will be expected to complete as part of the core and electives:

i. *Atmospheric Chemistry: CHEM F601, CHEM F605, CHEM F606 and CHEM F631*

ii. *Aqueous/Environmental Geochemistry: CHEM F605, CHEM F606 or CHEM F631, GEOS F618 and CHEM F609/GEOS F633.*

iii. *Environmental Toxicology and Contaminant Fate: CHEM F605 or CHEM F606, CHEM F631 and CHEM F655*

A customized focus area may be developed based on an appropriate sequence of core and elective courses, subject to approval by the student's advisory committee.

See Biochemistry and Molecular Biology Ph.D. program.

See Environmental Chemistry Ph.D. program.

D. ESTIMATED IMPACT

WHAT IMPACT, IF ANY, WILL THIS HAVE ON BUDGET, FACILITIES/SPACE, FACULTY, ETC.

This change will simplify paperwork for our M.S. programs by consolidating all Masters under the Chemistry degree. For the past few years, we have used common procedures for all M.S. degrees, so this change is easy to implement.

E. IMPACTS ON PROGRAMS/DEPTS:

What programs/departments will be affected by this proposed action?

Include information on the Programs/Departments contacted (e.g., email, memo)

None outside our department

F. IF MAJOR CHANGE - ASSESSMENT OF THE PROGRAM:

Description of the student learning outcomes assessment process.)

The intended learning outcomes from our M.S. programs were very similar before this change, and with this change will be fully unified. The intended outcomes are listed below.

1. Graduates attain a level of technical ability and knowledge to function as professionals in their discipline.
2. Masters graduates have performed research using technical, safety, and problem solving skills to contribute to their field.
3. Communication/presentation skills are consistent with professional standards.
4. Graduates obtain employment or continue education in the field following graduation.


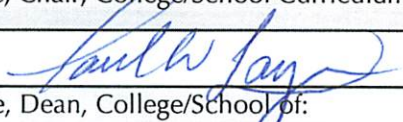
The classes and research contributions (parts 1 and 2) above differ between each concentration, but we can assess the success of each concentration and adjust its requirements to assure that these general learning outcomes are attained.

JUSTIFICATION FOR ACTION REQUESTED

The purpose of the department and campus-wide curriculum committees is to scrutinize program/degree change applications to make sure that the quality of UAF education is not lowered as a result of the proposed change. Please address this in your response. This section needs to be self-explanatory. If you drop a course, is it because the material is covered elsewhere? Use as much space as needed to fully justify the proposed change and explain what has been done to ensure that the quality of the program is not compromised as a result.

This change allows us to consolidate all M.S. programs within our department into one M.S. program with concentrations that reflect our focal areas (those of our two Ph.D. programs). Each of those concentrations have core courses that are parallel to the Ph.D. programs, while the Chemistry M.S. without concentration retains flexibility. This change will simplify procedures for M.S. graduate students by having one unified departmental set of procedures and will allow for better assessment of student learning outcomes through improved statistics arising from larger numbers of students passing through this combined M.S. program. The learning outcomes of all M.S. programs were similar in the past, so this change has minimal impact on intended learning outcomes.

APPROVALS:

| | | |
|---|------|-------------|
| William Simpson | Date | 20 Sep 2013 |
| Signature, Chair, Program/Department of: Chemistry and Biochemistry | | |
|  | Date | 10-1-13 |
| Signature, Chair, College/School Curriculum Council for: CNSM | | |
|  | Date | 10/2/13 |
| Signature, Dean, College/School of: CNSM | | |

ALL SIGNATURES MUST BE OBTAINED PRIOR TO SUBMISSION TO THE GOVERNANCE OFFICE

| | | |
|--|------|--|
| | Date | |
| Signature, Chair, UAF Faculty Senate Curriculum Review Committee | | |