

Submit originals and one copy and electronic copy to Governance/Faculty Senate Office (email electronic copy to fysenat@uaf.edu)

PROGRAM/DEGREE REQUIREMENT CHANGE (MAJOR/MINOR)

SUBMITTED BY:

Department	Chemistry and Biochemistry	College/School	College of Natural Sciences and Mathematics
Prepared by	Tom Trainor	Phone	5628
Email Contact	tptrainor@alaska.edu	Faculty Contact	Tom Trainor

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

PROGRAM IDENTIFICATION:

DEGREE PROGRAM	Environmental Chemistry
Degree Level: (i.e., Certificate, A.A., A.A.S., B.A., B.S., M.A., M.S., Ph.D.)	M.S., Ph.D.

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

We are proposing to add a track within the Environmental Chemistry M.S./Ph.D. program focused on "Environmental Toxicology and Fate". This change is coupled to the course change proposal for CHEM F655, which will be a core course for this track. Some additional minor changes are included in the text to clarify the program requirements.

B. CURRENT REQUIREMENTS AS IT APPEARS IN THE CATALOG:

Environmental Chemistry

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

M.S., Ph.D. Degrees

Minimum Requirements for Degrees: M.S.: 30 credits; Ph.D.: 18 thesis credits

Environmental Chemistry is a diverse and highly interdisciplinary field that focus on the chemical processes influencing the composition and chemical speciation of natural systems (air, water and soils), the chemical fate and mobility of contaminants in the environment, chemical processes that affect the toxicity and bioavailability of contaminants and chemical aspects of contaminant remediation and pollution prevention (green chemistry). The common link to all these areas of study is a focus on the underlying chemical structure, reactivity and mechanisms that dictate the extent and rates of environmentally important chemical reactions. Environmental chemistry is a challenging field, requiring core training in physical, analytical, organic and inorganic chemistry and an understanding of how these disciplines can be applied to complex environmental systems. It is also a highly rewarding discipline, as it provides a quantitative and fundamental approach to understanding the processes that influence the quality of the environment we live and work in.

The UAF Department of Chemistry and Biochemistry offers B.S., M.S. and Ph.D. degrees in

RECEIVED

MAY 23 2011

Dean's Office
College of Natural Science & Mathematics

Environmental Chemistry. The program provides education and research opportunities focused on the molecular scale aspects of Environmental Science. Our faculty are involved in a wide range of projects: from field studies of chemical transformation and transport, to laboratory and modeling studies of the basic mechanisms of environmental reactions, to the development of novel chemistry useful in contaminant remediation. The program is centered in the Natural Sciences Building on the UAF campus that houses state-of-the-art classrooms, laboratories and computer facilities to support education and research activities. Located in the "Heart of Alaska," UAF is home to numerous research institutes and centers that focus on Arctic science and engineering and provide great opportunities for collaboration and cross-disciplinary studies focused on the chemistry of polar and sub-arctic systems.

The graduate program in Environmental Chemistry provides advanced training in the concepts and methods of Molecular Environmental Sciences. The M.S. degree prepares students for careers in Environmental Science and Technology sector as a specialist in the analysis and interpretation of Environmental Chemical data and/or for more advanced studies in Environmental Chemistry or related disciplines. The requirement of a Masters Thesis provides an opportunity for students to gain expertise in a particular sub-discipline and, more importantly, gain experience in research methods, presentation skills and critical thinking. The Ph.D. provides advanced training beyond the level of a Masters degree with the expectation that Ph.D. recipients will be acknowledged as an expert in their particular topic of study. This is accomplished primarily through the Ph.D. thesis, which is a body of independent research that presents new findings on forefront topics related to molecular processes in the environment. The Ph.D. degree in Environmental Chemistry prepares students for careers in academia or the public and private research sectors. Graduate (M.S. and Ph.D.) students in the Environmental Chemistry program are typically supported through teaching and research assistantships or fellowships.

Graduate Program — M.S. Degree

1. Complete the general university requirements (page 192).
2. Complete the master's degree requirements (page 196).
3. Complete the following environmental core courses:
CHEM F605—Fundamentals of Environmental Chemistry—3 credits
CHEM F606—Atmospheric Chemistry—3 credits
CHEM F631—Environmental Fate & Transport—3 credits
4. Complete two seminar courses
CHEM F691—Research Presentation Techniques—1 credit
CHEM F692—Seminar—1 credit
5. Approved electives 3 – 6*
6. Complete a thesis—12 credits
7. Minimum credits required—30 – 33 credits

Graduate Program — Ph.D. Degree

1. Complete the general university requirements (page 192).

2. Complete the Ph.D. degree requirements (page 196).
3. Complete the following environmental core courses:
 CHEM F605—Fundamentals of Environmental Chemistry—3 credits
 CHEM F606—Atmospheric Chemistry—3 credits
 CHEM F631—Environmental Fate & Transport—3 credits
4. Complete two seminar courses.
 CHEM F691—Research Presentation Techniques—1 credit
 CHEM F692—Seminar—1 credit
5. Approved electives 3 – 6*
6. Complete a thesis—18 credits
7. Minimum credits required—32 – 35 credits

See Biochemistry and Molecular Biology.
 See Chemistry.

* Approved electives (both M.S. and Ph.D.)

Note: Students in the atmospheric focus area should also take CHEM F601—Fundamentals of Atmospheric Science. Students in the terrestrial/aquatic focus area should also take GEOS F618—Introduction to Geochemistry and CHEM F609/GEOS F633—Environmental Geochemistry. Additional course work requirements may be specified by the students committee.

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)

Environmental Chemistry

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

M.S., Ph.D. Degrees

Minimum Requirements for Degrees: M.S.: 30 credits; Ph.D.: 18 thesis credits

Environmental Chemistry is a diverse and highly interdisciplinary field that focus on the chemical processes influencing the composition and chemical speciation of natural systems (air, water and soils), the chemical fate and mobility of contaminants in the environment, chemical processes that affect the toxicity and bioavailability of contaminants and chemical aspects of contaminant remediation and pollution prevention (green chemistry). The common link to all these areas of study is a focus on the underlying chemical structure, reactivity and

mechanisms that dictate the extent and rates of environmentally important chemical reactions. Environmental chemistry is a challenging field, requiring core training in physical, analytical, organic and inorganic chemistry and an understanding of how these disciplines can be applied to complex environmental systems. It is also a highly rewarding discipline, as it provides a quantitative and fundamental approach to understanding the processes that influence the quality of the environment we live and work in.

The UAF Department of Chemistry and Biochemistry offers B.S., M.S. and Ph.D. degrees in Environmental Chemistry. The program provides education and research opportunities focused on the molecular scale aspects of environmental science. The program defines three tracks to meet a wide range of student interest, including (i) Atmospheric Chemistry, (ii) Aqueous/Environmental Geochemistry, and (iii) Environmental Toxicology and Contaminant Fate. Students may also design a custom focus area, subject to approval by their advisory committee.

Deleted: Environmental

Deleted: Science

Our faculty are involved in a wide range of projects: from field studies of chemical transformation and transport, to laboratory and modeling studies of the basic mechanisms of environmental reactions, to the development of novel chemistry useful in contaminant remediation. The program is centered in the Natural Sciences Building on the UAF campus that houses state-of-the-art classrooms, laboratories and computer facilities to support education and research activities. Located in the "Heart of Alaska," UAF is home to numerous research institutes and centers that focus on Arctic science and engineering and provide great opportunities for collaboration and cross-disciplinary studies focused on the chemistry of polar and sub-arctic systems.

The graduate program in Environmental Chemistry provides advanced training in the concepts and methods of molecular environmental sciences. The M.S. degree prepares students for careers in environmental science and technology sector as a specialist in the analysis and interpretation of environmental chemical data and/or for more advanced studies in Environmental Chemistry or related disciplines. The requirement of a Masters Thesis provides an opportunity for students to gain expertise in a particular sub-discipline and, more importantly, gain experience in research methods, presentation skills and critical thinking. The Ph.D. provides advanced training beyond the level of a Masters degree with the expectation that Ph.D. recipients will be acknowledged as an expert in their particular topic of study. This is accomplished primarily through the Ph.D. thesis, which is a body of independent research that presents new findings on forefront topics related to molecular processes in the environment. The Ph.D. degree in Environmental Chemistry prepares students for careers in academia or the public and private research sectors. Graduate (M.S. and Ph.D.) students in the Environmental Chemistry program are typically supported through teaching and research assistantships or fellowships.

Deleted: M

Deleted: Environmental

Deleted: Sciences

Deleted: E

Deleted: S

Deleted: T

Deleted: E

Deleted: C

Graduate Program — M.S. Degree

1. Complete the general university requirements (page 192).
2. Complete the master's degree requirements (page 196).
3. Complete two of the following core courses:

CHEM F605—Aquatic Chemistry—3 credits

CHEM F606—Atmospheric Chemistry—3 credits

CHEM F631—Environmental Fate & Transport—3 credits

CHEM F655—Environmental Toxicology—3 credits

Deleted: the

Deleted: environmental

Deleted: Fundamentals of
Environmental

4. Complete two seminar courses

CHEM F691—Research Presentation Techniques—1 credit

CHEM F692—Seminar—1 credit

5. Complete approved electives*

6. Complete a thesis—12 credits

7. Minimum credits required—30 credits

Deleted: A

Deleted: 3 - 6

Deleted: - 33

Graduate Program — Ph.D. Degree

1. Complete the general university requirements (page 192).

2. Complete the Ph.D. degree requirements (page 196).

3. Complete three of the following core courses:

CHEM F605—Aquatic Chemistry—3 credits

CHEM F606—Atmospheric Chemistry—3 credits

CHEM F631—Environmental Fate & Transport—3 credits

CHEM F655—Environmental Toxicology—3 credits

4. Complete two seminar courses.

CHEM F691—Research Presentation Techniques—1 credit

CHEM F692—Seminar—1 credit

5. Complete approved electives*

6. Complete a thesis—18 credits

7. Minimum credits required—32 credits

Deleted: environmental

Deleted: Fundamentals of Environmental

Deleted: A

Deleted: 3 - 6

Deleted: - 35

Formatted: Space Before: 0 pt, After: 0 pt

Deleted: both

Deleted: Note:

Deleted: Students in the

Deleted: atmospheric

Deleted: focus area

Deleted: should also take

Deleted: will be expected to complete as part of the core and electives

Deleted: —Fundamentals of Atmospheric Science

Deleted: Students in the

Deleted: terrestrial/a

Deleted: atic

Deleted:

Deleted: focus area should also take

Deleted: will be expected to complete as part of the core and electives

Deleted: —Introduction to Geochemistry and

Deleted: —Environmental Geochemistry

Deleted: Students in the

Deleted: and Fate focus area will be expected to complete as part of the core and elective courses

Deleted: Additional course work requirements may be specified by the students committee.

See Biochemistry and Molecular Biology.

See Chemistry.

* Approved electives (M.S. and Ph.D.) are specified by the students 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 631, GEOS F618 and CHEM F609/GEOS F633.

(iii) Environmental Toxicology and Contaminant Fate: CHEM F605 or CHEM F606, CHEM 631 and CHEM 655.

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

D. ESTIMATED IMPACT

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

Minor to none.

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)*

This change directly impacts the Department of Chemistry and Biochemistry, Environmental Chemistry Program (Chair Prof. William Simpson, wrsimpson@alaska.edu)

F. IF MAJOR CHANGE - ASSESSMENT OF THE PROGRAM:

Description of the student learning outcomes assessment process.)

NA

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.

We are updating the program requirements for MS and Ph.D. in Environmental Chemistry to (1) clarify the description of program requirement and (2) add a new focus area in Environmental Toxicology and Contaminant Fate. These changes are coupled to two course change proposals that are being submitted in parallel with this program update.

The addition of a Toxicology and Contaminant Fate track within Environmental Chemistry is motivated by the push in this area from our core and affiliate faculty, and student interest/demand. The environmental toxicology and contaminant fate area is highly complimentary to our currently described focus areas in Atmospheric and Aqueous/Environmental Geochemistry, and will result in a more well rounded program, that can best serve the needs of a diverse range of students interested in the chemical/molecular aspects of environmental science.

Deleted: Aquatic Chemistry/

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)

This change directly impacts the Department of Chemistry and Biochemistry, Environmental Chemistry Program (Chair Prof. William Simpson, wrsimpson@alaska.edu)

F. IF MAJOR CHANGE - ASSESSMENT OF THE PROGRAM:

Description of the student learning outcomes assessment process.)

NA

JUSTIFICATION FOR ACTION REQUESTED



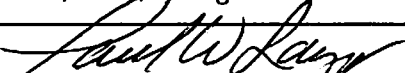
The purpose of the department and campus-wide curriculum committees is to scrutinize program/degree change applications to make sure that the quality of UAF education is not lowered as a result of the proposed change. Please address this in your response. This section needs to be self-explanatory. If 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.

We are updating the program requirements for MS and Ph.D. in Environmental Chemistry to (1) clarify the description of program requirement and (2) add a new focus area in Environmental Toxicology and Fate. These changes are coupled to two course change proposals that are being submitted in parallel with this program update.

The addition of a Toxicology and Fate track within Environmental Chemistry is motivated by the push in this area from our core and affiliate faculty, and student interest/demand. The environmental toxicology and fate area is highly complimentary to our currently described focus areas in Atmospheric and Aquatic Chemistry/Aqueous Geochemistry, and will result in a more well rounded program, that can best serve the needs of a diverse range of students interested in the chemical/molecular aspects of environmental science.

Revised per curriculum council recommendations.
See attached revision

APPROVALS:

	(William Simpson)	Date	4 May 2011
Signature, Chair, Program/Department of:		Chemistry + Biochemistry	
		Date	5/23/11
Signature, Chair, College/School Curriculum Council for:		CNSM	
		Date	May 29, 2011
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