Graduate Academic Board

Agenda

October 25, 2013
ADM 204
9:30 to 11:30

I. Roll Call

() Arlene Schmuland	() Hsing-Wen Hu	() Sam Thiru	
() Susan Garton	() Peter Olsson	() COH Vacancy	Ex-Officio Members:
() Greg Protasel	() Anthony Paris	() GSA Vacancy	() David Yesner
() Dennis Drinka	() Patricia Sandberg	() FSAL vacancy	() Lora Volden
() Jervette Ward	() Clayton Trotter		() Scheduling & Publications

II. Approval of Agenda (pg. 1)

III. Approval of Meeting Summary (pg. 2-3)

IV. Program/Course Action Request – Second Reading

Add	CHEM A611	Advanced Biophysical Chemistry (Stacked with CHEM A411) (3 cr)(3+0)(pg. 4-13)
Chg	CHEM A650	Advanced Environmental Chemistry (Stacked with CHEM A450) (3 cr)(3+0)(pg. 14-24)
Add	CHEM A677	Advanced Bioanalytical Chemistry (Stacked with CHEM A477) (3 cr)(3+6)(pg. 25-35)
Add	CHEM A680	Advanced Nuclear Magnetic Resonance (Stacked with CHEM A480) (3 cr)(3+0)(pg. 36-44)
Add	CHEM A690	Advanced Lecture Topics in Chemistry (Stacked with CHEM A490) (3 cr)(1-3+0)(pg. 45-54)
Chg	CHEM A698	Graduate Research (1-6 cr)(0+3+18)(pg. 55-58)

V. Program/Course Action Request - First Readings

Add	EDCN A643	Grief Trauma Counseling with Families (3 cr)(3+0)(pg. 59-65)
Add	EDCN A695F	Counseling Internship: Marriage/Family (3-6 cr)(1+15-30)(pg. 66-71)

VI. Administrative Reports

A. Associate Dean of the Graduate School David Yesner

B. Graduate Student

C. University Registrar Lora Volden

VII. Chair's Report

A. GAB Chair- Arlene Schmuland

B. Faculty Alliance

C. Graduate Council

VIII. Old Business

IX. New Business

A. Curriculum Handbook text regarding stacked courses (pg. 72-74)
B. Credit Hour Audit

X. Informational Items and Adjournment

September 27, 2013
LIB 307
9:30 to 11:30

I. Roll Call

(x) Arlene Schmuland	(x) Hsing-Wen Hu	() CAS vacancy	
(e) Susan Garton	(x) Peter Olsson	()FSAL vacancy	Ex-Officio Members:
(x) Greg Protasel	(x) Anthony Paris	()FSAL vacancy	(x) David Yesner
() Dennis Drinka	() GSA Vacancy	() FSAL vacancy	(x) Lora Volden
() Laura Kelly	(x) Jervette Ward		() Scheduling & Publications

Visiting Members
(x) Patricia Sandberg
(x) Sam Thiru
() Clayton Trotter

II. Approval of Agenda (pg. 1)
Approved

III. Approval of Meeting Summary (pg. 2-3)
Approved

IV. Program/Course Action Request – Second Reading

V. Program/Course Action Request - First Readings
Chg BA A686 Management Simulation (3 cr)(3+0)(pg. 4-9)
Waive first reading, approve for second

VI. Administrative Reports
A. Associate Dean of the Graduate School David Yesner
Graduate Council had their first meeting this month; new business included graduate faculty, revisions to the Graduate Council constitution, and various Graduate School processes
Discussed the application process at UAA and UAF for doctoral programs

B. Graduate Student
No Representative

C. University Registrar Lora Volden
An invitation email was sent out to faculty and staff this week inviting them to the October 8th CourseLeaf presentation
BOR approved a change to the residency credit policy; any course taken within the UA system will be counted as a residency credit

VII. Chair's Report
A. GAB Chair- Arlene Schmuland

B. Faculty Alliance

C. Graduate Council

VIII. Old Business

IX. New Business
A. 2013-2014 Goals (pg. 10)
Discussed the process/standards of graduate /undergraduate stacked courses and added it as a goal for this academic year; discussion will continue at the next meeting
Motion to approve the 2013-2014 goals as amended.
Unanimously Approved

B. Minor changes to CAR box 8 and box 16c. (pg. 11)
Motion to approve changes to the CAR boxes 8 and 16c.
Unanimously Approved

C. Standard Catalog Language
Standard language for special topics courses:
Special note: May be repeated [number of times] for credit with change of subtitle.
Special note: May be repeated for a maximum of [number of] credits with change of subtitle.
Special note: May be repeated [number of times] for a maximum of [number of] credits with change of subtitle.

Standard language for stacked graduate courses:
Special note: Not available for credit to students who have completed [undergraduate stacked course].

Motion to approve the standard language for special topics and stacked graduate courses.
Unanimously Approved

X. Informational Items and Adjournment

A. Library Resource Costs (pg. 12-13)

Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College	1b. Division	1c. Department
AS CAS	AMSC Division of Math Science	Chemistry

2. Course Prefix	3. Course Number	4. Previous Course Prefix & Number	5a. Credits/CEUs	5b. Contact Hours (Lecture + Lab)
CHEM	A611		3	(3+0)

6. Complete Course Title
Advanced Biophysical Chemistry
Adv Biophysical Chemistry
Abbreviated Title for Transcript (30 character)

7. Type of Course ☒ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action: ☒ Add *or* ☐ Change *or* ☐ Delete

If a change, mark appropriate boxes:

- ☐ Prefix
- ☐ Credits
- ☐ Title
- ☐ Grading Basis
- ☐ Course Description
- ☐ Test Score Prerequisites
- ☐ Other Restrictions
  - ☐ Class ☐ Level
  - ☐ College ☐ Major
- ☐ Other (please specify)
- ☐ Course Number
- ☐ Contact Hours
- ☐ Repeat Status
- ☐ Cross-Listed/Stacked
- ☐ Course Prerequisites
- ☐ Co-requisites
- ☐ Registration Restrictions

9. Repeat Status No # of Repeats 0 Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

11. Implementation Date semester/year
From: Fall/2013 To: /9999

12. ☐ Cross Listed with
☒ Stacked with CHEM A411
Signature Cross-Listed Coordination

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.
Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

Impacted Program/Course	*Date of Coordination*	*Chair/Coordinator Contacted*
1. Interdisciplinary Masters Program		
2.		
3.		

Initiator Name (typed): Holmberg Initiator Signed Initials: _____ Date:_____

13b. Coordination Email Date: _____
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison Date: _____

14. General Education Requirement
Mark appropriate box:
☐ Oral Communication ☐ Written Communication ☐ Quantitative Skills ☐ Humanities
☐ Fine Arts ☐ Social Sciences ☐ Natural Sciences ☐ Integrative Capstone

15. Course Description *(suggested length 20 to 50 words)*
Advanced study of Biophysical Chemistry through the principles of thermodynamics, kinetic concepts and spectroscopic analysis. Introduction to computational techniques in physical chemistry. Examination of the current literature in Biophysical Chemistry.

16a. Course Prerequisite(s) *(list prefix and number or test code and score)*

16b. Co-requisite(s) *(concurrent enrollment required)*

16c. Other Restriction(s)
☐ College ☐ Major ☐ Class ☒ Level

16d. Registration Restriction(s) *(non-codable)*
Instructor permission and graduate standing.

17. ☐ Mark if course has fees

18. ☐ Mark if course is a selected topic course

19. Justification for Action
Addition of graduate level course stacked with CHEM A411 for inclusion in the Interdisciplinary Masters Program.

Initiator (faculty only) Date
Holmberg
Initiator (TYPE NAME)

☐ Approved
☐ Disapproved Department Chair Date

☐ Approved
☐ Disapproved College/School Curriculum Committee Chair Date

☐ Approved
☐ Disapproved Dean/Director of School/College Date

☐ Approved
☐ Disapproved Undergraduate/Graduate Academic Board Chair Date

☐ Approved
☐ Disapproved Provost or Designee Date

Course Content Guide for **CHEM A611**

University of Alaska Anchorage

College of Arts and Sciences

I. **Date of Initiation:** February 22, 2013

II. **Course information**

A. **College**: College of Arts and Sciences

B. **Course Subject**: CHEM

C. **Course Number**: A611

D. **Number of Credits**: 3

E. **Contact Hours**: 3+0

F. **Course Title**: Advanced Biophysical Chemistry

G. **Grading Basis**: A – F

H. **Implementation Date**: Spring 2014

I. **Course Description**: Advanced study of Biophysical Chemistry through the principles of thermodynamics, kinetic concepts and spectroscopic analysis. Introduction to computational techniques in physical chemistry. Examination of the current literature in Biophysical Chemistry. Special note: not available for students who have taken CHEM A411.

J. **Course Attributes**: N/A

K. **Prerequisites**: N/A

L. **Test Scores**: N/A

M. **Corequisites**: N/A

N. **Registration Restrictions**: Instructor permission and graduate standing.

O. **Course Fee**: No

P. **Stacked With**: CHEM A411

III. Instructional Goals and Student Learning Outcomes

A. Instructional Goals:

The instructor will:

1. Present advanced principles of thermodynamics with applications to biochemical systems.
2. Detail advanced concepts in molecular kinetic theory with applications to transport properties of macromolecules.
3. Present chemical kinetics with heavy accent on enzymatic catalysis and biological system modeling.
4. Utilize spectroscopic techniques for bio-molecular characterization as well as modern computational techniques.
5. Derive pertinent expressions from basic principles using theoretical modeling techniques.

B. Student Learning Outcomes:

Student Learning Outcomes Students will:	Assessment Methods
Demonstrate critical thinking skills for explanation and prediction of biophysical/bio-chemical phenomena using thermodynamics and chemical kinetics.	Quizzes, Exams, Class Activities
Integrate mathematical skills such as calculus, differential equations, and linear algebra and chemical concepts with applications in physical chemistry. Demonstrate proficiency in derivation of advanced concepts from fundamental principles.	Quizzes, Exams, Class Activities
Apply a range of spectroscopic and computational techniques for bio-molecular characterization and applications to biochemical problems.	Quizzes, Exams, Research Paper
Apply the knowledge of kinetics to design methods for determination of reactions' mechanisms.	Quizzes, Exams, Research Paper

IV. Course Activities

A. Lecture
B. Assignments
C. Critical Thinking Questions
D. Quizzes
E. Exams
F. Research Paper

V. Guidelines for Evaluation

The students will be evaluated based on their performance on quizzes, in-class exams, research papers and comprehensive final. The grades A – F will be assigned based on a curve that is deemed reasonable by the instructor.

VI. Course Level Justification

This course requires a background in the principles of chemistry, advanced calculus and mathematical techniques such as differential equations and linear algebra, and concepts in physics. It also requires analytical thinking, critical analysis, and attention to detail. Students will be required to assimilate a number of concepts while clearly describing complex biological phenomenon.

VII. Course Outline

- Principles of Thermodynamics: laws of thermodynamics, application to biochemical systems. Applications topics discussed can include thermodynamic basis of protein stability, ligand binding equilibria, Scatchard's and Hill's models, differential scanning calorimetry, transport across membranes, phase transition in lipid bilayers, equilibria in double stranded helices of complementary oligonucleotides.
- Molecular Kinetic Theory and Transport Properties, applications to Fick's Laws, viscosity and sedimentation as applied to bio-molecular measurements.
- Chemical Kinetics as applied to enzymatic catalysis.
- Introduction to spectroscopy and computational techniques as applied to characterization of secondary and tertiary structure of proteins, as well as structural characterization of RNA/DNA molecules.

VIII. Suggested Texts

1. Atkins, Physical Chemistry For the Life Sciences, 3rd edition, W H Freeman & Co, 2005.

2. Engel, Reid, Drobny. Physical Chemistry For the Life Sciences, 1st edition, Prentice Hall, 2007.

3. Tinoco, Sauer, Wang, and Puglisi. Physical Chemistry: Principles and Applications In Biological Sciences, 4th edition, Prentice Hall, 2012.

Additional bibliography for instructors:

Methods of Enzymology, http://www.sciencedirect.com/science/bookseries/00766879

Biophysical Journal http://www.cell.com/biophysj/

Journal of Physical Chemistry pubs.acs.org/**journal**/jpcafh

Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College	1b. Division	1c. Department
AS CAS	AMSC Division of Math Science	Chemistry

2. Course Prefix	3. Course Number	4. Previous Course Prefix & Number	5a. Credits/CEUs	5b. Contact Hours (Lecture + Lab)
CHEM	A411	A311	3	(3+0)

6. Complete Course Title
Biophysical Chemistry

Abbreviated Title for Transcript (30 character)

7. Type of Course ☒ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action: ☐ Add *or* ☒ Change *or* ☐ Delete

If a change, mark appropriate boxes:

- ☐ Prefix
- ☐ Credits
- ☒ Title
- ☐ Grading Basis
- ☒ Course Description
- ☐ Test Score Prerequisites
- ☐ Other Restrictions
  - ☐ Class ☐ Level
  - ☐ College ☐ Major
- ☒ Other CCG (please specify)
- ☒ Course Number
- ☐ Contact Hours
- ☐ Repeat Status
- ☒ Cross-Listed/Stacked
- ☒ Course Prerequisites
- ☐ Co-requisites
- ☐ Registration Restrictions

9. Repeat Status No # of Repeats 0 Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

11. Implementation Date semester/year
From: Summer/2014 To: /9999

12. ☐ Cross Listed with

☒ Stacked with CHEM A611 _____ Cross-Listed Coordination
Signature

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

Impacted Program/Course	*Date of Coordination*	*Chair/Coordinator Contacted*
1. Chemistry	10/3/2013	Holmberg
2. Physics (PHYS A124)	2/21/2013	Pantaleone
3. Math (MATH A201)	2/26/2013	Thiru

Initiator Name (typed): Holmberg Initiator Signed Initials: _____ Date:_____

13b. Coordination Email Date: 10/3/2013
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison Date: 10/3/2013

14. General Education Requirement *Mark appropriate box:*
☐ Oral Communication ☐ Written Communication ☐ Quantitative Skills ☐ Humanities
☐ Fine Arts ☐ Social Sciences ☐ Natural Sciences ☐ Integrative Capstone

15. Course Description *(suggested length 20 to 50 words)*
Study of principles of thermodynamics, chemical kinetics, molecular kinetic theory and spectroscopy as applied to biochemical systems. Applications to solutions, phase equilibria, biochemical reactions, transport properties, and spectroscopic techniques for biomolecular characterization. Introduction to computational techniques in physical chemistry.

16a. Course Prerequisite(s) *(list prefix and number or test code and score)*
(CHEM A106, MATH A201, and PHYS A124) with minimum grade of C.

16b. Co-requisite(s) *(concurrent enrollment required)*
n/a

16c. Other Restriction(s)
☐ College ☐ Major ☐ Class ☐ Level

16d. Registration Restriction(s) *(non-codable)*
n/a

17. ☐ Mark if course has fees

18. ☐ Mark if course is a selected topic course

19. Justification for Action
Updating course level to appropriate numbering considering course depth and breadth and title as a required course for Chemistry/Biochemistry option and CHEM minor and as an elective class for science majors due to student demand.

Initiator (faculty only) Date
Holmberg
Initiator (TYPE NAME)

☐ Approved
☐ Disapproved Department Chair Date

☐ Approved
☐ Disapproved College/School Curriculum Committee Chair Date

☐ Approved
☐ Disapproved Dean/Director of School/College Date

☐ Approved
☐ Disapproved Undergraduate/Graduate Academic Board Chair Date

☐ Approved
☐ Disapproved Provost or Designee Date

Course Content Guide for **CHEM A411**

University of Alaska Anchorage

College of Arts and Sciences

I. **Date of Initiation:** February 22, 2013

II. **Course information:**

A. **College**: College of Arts and Sciences

B. **Course Subject**: CHEM

C. **Course Number**: A411

D. **Number of Credits**: 3

E. **Contact Hours**: 3+0

F. **Course Title**: Biophysical Chemistry

G. **Grading Basis**: A – F

H. **Implementation Date**: Summer 2014

I. **Course Description**: Study of principles of thermodynamics, chemical kinetics, molecular kinetic theory and spectroscopy as applied to biochemical systems. Applications to solutions, phase equilibria, biochemical reactions, transport properties, and spectroscopic techniques for biomolecular characterization. Introduction to computational techniques in physical chemistry.

J. **Course Attributes**: N/A

K. **Prerequisites**: (CHEM A106, MATH A201, and PHYS A124) with minimum grade of C.

L. **Test Scores**: N/A

M. **Corequisites**: N/A

N. **Registration Restrictions**: N/A

O. **Course Fee**: No

P. **Stacked With**: CHEM A611

III. Instructional Goals and Student Learning Outcomes

A. Instructional Goals:

Instructor will:

1. Present principles of thermodynamics with applications to bio-chemical systems.
2. Introduce molecular kinetic theory with applications to transport properties of macromolecules.
3. Introduce chemical kinetics with heavy accent on enzymatic catalysis.
4. Demonstrate spectroscopic techniques for bio-molecular characterization as well as modern computational techniques.

B. Student Learning Outcomes:

Student Learning Outcomes Students will:	Assessment Methods
Demonstrate critical thinking skills for explanation and prediction of bio-physical/bio-chemical phenomena using thermodynamics and chemical kinetics.	Quizzes, Exams, Assignments, Critical Thinking Questions
Integrate mathematical skills and concepts learned in MATH 200-201 classes with applications in physical chemistry.	Quizzes, Exams, Assignments, Critical Thinking Questions
Demonstrate knowledge of spectroscopic and computational techniques for bio-molecular characterization.	Quizzes, Exams
Apply the knowledge of kinetics to design methods for determination of reactions' mechanisms.	Quizzes, Exams

IV. Course Activities

A. Lecture
B. Assignments

C. Critical Thinking Questions
D. Quizzes
E. Exams
F. Comprehensive Final

V. Guidelines for Evaluation

The students will be evaluated based on their performance on quizzes, in-class exams and comprehensive final.

VI. Course Level Justification

This course requires a background in the principles of chemistry, calculus and basic concepts in physics. It also requires a great deal of analytical thinking, critical analysis, and medium to advanced level mathematics.

VII. Course Outline

A. Principles of Thermodynamics: laws of thermodynamics, application to bio-chemical systems. Application topics discussed can include thermodynamic basis of protein stability, ligand binding equilibria, Scatchard's and Hill's models, differential scanning calorimetry, transport across membranes, phase transition in lipid bilayers, equilibria in double stranded helices of complementary oligonucleotides.
B. Molecular Kinetic Theory and Transport Properties, applications to Fick's Laws, viscosity and sedimentation as applied to bio-molecular measurements.
C. Chemical Kinetics as applied to enzymatic catalysis.
D. Introduction to spectroscopy and computational techniques as applied to characterization of secondary and tertiary structure of proteins, as well as structural characterization of RNA/DNA molecules.

VIII. Suggested Texts

1. Atkins, Physical Chemistry For the Life Sciences, 3rd edition, W H Freeman & Co, 2005.

2. Engel, Reid, Drobny. Physical Chemistry For the Life Sciences, 1st edition, Prentice Hall, 2007.

3. Tinoco, Sauer, Wang, and Puglisi. Physical Chemistry: Principles and Applications In Biological Sciences, 5th edition, Prentice Hall, 2012.

IX. **Bibliography**

Scientific Journals such as (not a comprehensive list):

Biological Chemistry
Biochemistry
Biophysical Journal
Cell
Journal of Biological Chemistry
Journal of Molecular Biology
Molecular Biology
Molecular Cell
Nature
Nature Structure
Science

Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College	1b. Division	1c. Department
AS CAS	AMSC Division of Math Science	Chemistry

2. Course Prefix	3. Course Number	4. Previous Course Prefix & Number	5a. Credits/CEUs	5b. Contact Hours (Lecture + Lab)
CHEM	A650	reinstate	3	(3+0)

6. Complete Course Title
Advanced Environmental Chemistry
Adv Environmental Chemistry
Abbreviated Title for Transcript (30 character)

7. Type of Course ☒ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action: ☐ Add *or* ☒ Change *or* ☐ Delete

If a change, mark appropriate boxes:

- ☐ Prefix
- ☐ Credits
- ☒ Title
- ☐ Grading Basis
- ☒ Course Description
- ☐ Test Score Prerequisites
- ☒ Other Restrictions
  - ☐ Class ☒ Level
  - ☐ College ☐ Major
- ☐ Other (please specify)
- ☐ Course Number
- ☐ Contact Hours
- ☐ Repeat Status
- ☒ Cross-Listed/Stacked
- ☐ Course Prerequisites
- ☐ Co-requisites
- ☒ Registration Restrictions

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

11. Implementation Date semester/year
From: Spring/2014 To: 99/9999

12. ☐ Cross Listed with
☒ Stacked with CHEM A450
Signature Cross-Listed Coordination

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.
Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

Impacted Program/Course	*Catalog Page(s) Impacted*	*Date of Coordination*	*Chair/Coordinator Contacted*
1. MS-AEST	None	08/28/13	John Olofsson
2. Interdisciplinary Masters Program			
3.			

Initiator Name (typed): John M. Kennish Initiator Signed Initials: _____ Date:_____

13b. Coordination Email Date: 8/28/13
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison Date: 8/28/13

14. General Education Requirement
Mark appropriate box:
☐ Oral Communication ☐ Written Communication ☐ Quantitative Skills ☐ Humanities
☐ Fine Arts ☐ Social Sciences ☐ Natural Sciences ☐ Integrative Capstone

15. Course Description *(suggested length 20 to 50 words)*
Detailed examination of structure and function of planer Earth as a living chemical system as constructed around the atmosphere, hydrosphere, lithosphere, and biosphere. The system will be examined as driven energetically by solar energy and energy provided by human technology. Chemical models will be detained along with the mathematical concepts required to understand the integration of the global system with resource utilization by humans. Special Note: Not available for credit to students who have taken CHEM A450.

16a. Course Prerequisite(s) *(list prefix and number)*

16b. Test Score(s)

16c. Co-requisite(s) *(concurrent enrollment required)*

16d. Other Restriction(s)
☐ College ☐ Major ☐ Class ☒ Level

16e. Registration Restriction(s) *(non-codable)*
Graduate standing and instructor permission.

17. ☐ Mark if course has fees

18. ☐ Mark if course is a selected topic course

19. Justification for Action
Addition of graduate level course stacked with CHEM A450 for inclusion into the Interdisciplinary Masters Program.

Initiator (faculty only) Date
John M. Kennish
Initiator (TYPE NAME)

☐ Approved
☐ Disapproved Department Chairperson Date

☐ Approved
☐ Disapproved Curriculum Committee Chairperson Date

☐ Approved
☐ Disapproved Dean/Director of School/College Date

☐ Approved
☐ Disapproved Undergraduate/Graduate Academic Board Chairperson Date

☐ Approved
☐ Disapproved Provost or Designee Date

Course Content Guide for **CHEM A650**

University of Alaska Anchorage

College of Arts & Sciences

I. **Date of Initiation**: February 22, 2013

II. **Course Information**:

A. **College**: College of Arts & Sciences

B. **Course Subject**: CHEM

C. **Course Number**: A650

D. **Number of Credits**: 3

E. **Contact Hours**: 3 + 0

F. **Course Title**: Advanced Environmental Chemistry

G. **Grading Basis**: A – F

H. **Implementation Date**: Spring 2014

I. **Course Description**: Detailed examination of the structure and function of planet Earth as a living chemical system as constructed around the atmosphere, hydrosphere, lithosphere, and biosphere. The system will be examined as driven energetically by solar energy and energy provided by human technology. Chemical models will be detained along with the mathematical concepts required to understand the integration of the global system with resource utilization by humans. Special Note: Not available for credit to students who have taken CHEM A450.

J. **Course Attributes**: N/A

K. **Prerequisites**: N/A

L. **Test Scores**: N/A

M. **Co-requisites**: N/A

N. **Registration Restrictions**: Graduate standing.

O. **Course Fee**: No

P. **Stacked With**: CHEM A450

III. **Instructional Goals and Student Learning Outcomes**

A. **Instructional Goals**:

The instructor will:

1. Present chemical models for investigation and develop problem solving and observational skills on problems relevant to current issues and topics in environmental chemistry.
2. Present convergent and divergent questions to initiate discussion on the relevance of current environmental models to observe and understand natural phenomena, help students differentiate, link and integrate ideas and develop their own concepts, to articulate their thinking and explain models and solutions.
3. Provide multiple historical, cultural, environmental and socially relevant contexts for applying concepts and quantitative skills and invite students to defend and verify their models and their solutions to problems relevant to these contexts.

B. **Student Learning Outcomes**:

Student Learning Outcomes Students will:	Assessment Methods
Solve problems relevant to the origin and evolution of the Earth's environment, about human impacts on this environment resulting from energy production and use of the atmosphere, hydrosphere and the biosphere.	Assigned problems and Exam
Use quantitative chemical principles to evaluate the interrelationships of anthropomorphic influences on changes occurring in the atmosphere, hydrosphere and biosphere.	Assigned problems and Exam
Communicate problems and verify solutions.	Assigned problems and Exam
Students will be able to propose a hypothesis and design a research proposal that addresses a specific question concerning a current contamination mechanism.	Research Proposal

Students will be able to make in-class presentation of their proposals	Presentation

IV. **Course Activities**

A. Lecture
B. Assigned problems
C. Exams
D. Research proposal
E. In-class presentations

V. **Guidelines for Evaluation**

Students will be evaluated based on their performance on assigned problems, in-class exams, a research proposal, and presentation. The grades A – F will be assigned based on a curve that is deemed reasonable by the instructor.

VI. **Course Level Justification**

This course requires extensive multidisciplinary knowledge from biology, chemistry, engineering, mathematics, and physics. It requires the integration of this knowledge to solve multidimensional problems and understand complex concepts. Graduate student must demonstrate this capability by designing a research project that meets this standard and then present and defend their hypothesis and research design before their peers and instructor.

VII. **Course Outline**

1. Energy
    a. Energy Flows and Supplies
    b. Fossil Fuels
    c. Nuclear Energy
    d. Renewable Energy
    e. Energy Utilization
2. Atmosphere
    a. Climate
    b. Oxygen Chemistry
    c. Stratospheric Ozone
    d. Air Pollution
3. Hydrosphere / Lithosphere
    a. Water Resources

b. Water as Solvent
c. Water and the Lithosphere
d. Oxygen and Life
e. Water Pollution and Water Treatment

4. Biosphere

VIII. **Suggested Texts**

Spiro, T.G., Purvis-Roberts, K.L. and Stigliani, W.M., *Chemistry of the Environment,* 3rd ed. *University Science Books, 2011*.

IX. **Bibliography**

1. Brasseur, G.P., Orlando, J.J., and Tyndall, G.S., *Atmospheric Chemistry and Global Change*. Oxford University Press, 1999.

2. Brezonik, P.L.; Arnold, W.A. Water Chemistry: An Introduction to the Chemistry of Natural and Engineered Systems, Oxford University Press. 2011.

3. Hemond, H.F. and Fechner-Levy, E.J., *Chemical Fate and Transport in the Environment*, 2nd ed. Academic Press, 2000.

4. Houghton, J., Global Warming: The Complete Briefing, 4th Edition, Cambridge University Press, 2009.

3. Pankow, J.F., *Aquatic Chemistry Concepts*. Lewis Publishers, 1991.

8. Seinfeld, J.H. and Pandis, S. Atmospheric Chemistry and Physics: From Air pollution to Climate Change, 2nd Edition, 2006, Wiley.

4. Schwarzenbach, R.P., Gschwend, P.M., and Imboden, D.M., *Environmental Organic Chemistry,* 2nd Ed. Wiley Interscience, 2003.

5. Stumm, W. and Morgan, J.J., *Aquatic Chemistry*. Wiley Interscience, 1996.

6. Thibodeaux, L.J., *Environmental Chemodynamics*. Wiley Interscience, 1996.

Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College	1b. Division	1c. Department
AS CAS	AMSC Division of Math Science	CHEMISTRY

2. Course Prefix	3. Course Number	4. Previous Course Prefix & Number	5a. Credits/CEUs	5b. Contact Hours (Lecture + Lab)
CHEM	A450	N/A	3	(3+0)

6. Complete Course Title
Environmental Chemistry

Abbreviated Title for Transcript (30 character)

7. Type of Course ☒ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action: ☐ Add *or* ☒ Change *or* ☐ Delete

If a change, mark appropriate boxes:

- ☐ Prefix
- ☐ Credits
- ☐ Title
- ☐ Grading Basis
- ☒ Course Description
- ☐ Test Score Prerequisites
- ☐ Other Restrictions
  - ☐ Class ☐ Level
  - ☐ College ☐ Major
- ☒ Other CCG (please specify)
- ☐ Course Number
- ☐ Contact Hours
- ☐ Repeat Status
- ☒ Cross-Listed/Stacked
- ☒ Course Prerequisites
- ☐ Co-requisites
- ☒ Registration Restrictions

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

11. Implementation Date semester/year
From: Summer/2014 To: /9999

12. ☐ Cross Listed with

☒ Stacked with CHEM A650

Signature Cross-Listed Coordination

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

Impacted Program/Course	*Catalog Page(s) Impacted*	*Date of Coordination*	*Chair/Coordinator Contacted*
1. B.S. Chemistry		2/22/2013	Eric Holmberg
2. CHEM 450 course listing	p. 390	2/22/2013	Eric Holmberg
3. B.S. Environment and Society	p. 109	10/3/2013	Dorn Van Dommelen
4. Minor Environmental Studies	p 109	10/3/2013	Dorn Van Dommelen
5. B.S. Natural Sciences	p. 126	10/3/2013	Fred Rainey
6. M.S. AEST	p. 335	10/3/2013	Osama Abaza

Initiator Name (typed): John M. Kennish Initiator Signed Initials: _____ Date:_____

13b. Coordination Email Date: 10/3/2013
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison Date: 10/3/2013

14. General Education Requirement
Mark appropriate box:
☐ Oral Communication ☐ Written Communication ☐ Quantitative Skills ☐ Humanities
☐ Fine Arts ☐ Social Sciences ☐ Natural Sciences ☐ Integrative Capstone

15. Course Description *(suggested length 20 to 50 words)*
Examines the origin and evolution of the environment, energy, mineral resources, solid wastes, recycling, air and water pollution, and the effects of foreign substances on living systems. The relationships among these problems will be demonstrated and quantitative chemical principles applied. Special Note: This course is an introduction to environmental chemistry for all science majors.

16a. Course Prerequisite(s) *(list prefix and number)*
CHEM A106 with grade of C or better.

16b. Test Score(s)

16c. Co-requisite(s) *(concurrent enrollment required)*

16d. Other Restriction(s)
☐ College ☐ Major ☐ Class ☐ Level

16e. Registration Restriction(s) *(non-codable)*
Instructor approval required.

17. ☐ Mark if course has fees

18. ☐ Mark if course is a selected topic course

19. Justification for Action
Course now stacked with the newly created CHEM A650, identify critical prerequisite, and include registration restriction.

Initiator (faculty only) Date John M. Kennish Initiator (TYPE NAME)		☐ Approved ☐ Disapproved	Dean/Director of School/College Date
☐ Approved ☐ Disapproved	Department Chairperson Date	☐ Approved ☐ Disapproved	Undergraduate/Graduate Academic Board Chairperson Date
☐ Approved ☐ Disapproved	Curriculum Committee Chairperson Date	☐ Approved ☐ Disapproved	Provost or Designee Date

Course Content Guide for **CHEM A450**

University of Alaska Anchorage

College of Arts & Sciences

I. **Date of Initiation**: February 22, 2013

II. **Course Information**:

A. **College**: College of Arts & Sciences

B. **Course Subject**: CHEM

C. **Course Number**: A450

D. **Number of Credits**: 3

E. **Contact Hours**: 3 + 0

F. **Course Title**: Environmental Chemistry

G. **Grading Basis**: A – F

H. **Implementation Date**: Summer 2014

I. **Course Description**: Examines the origin and evolution of the environment, energy, mineral resources, solid wastes, recycling, air and water pollution, and the effects of foreign substances on living systems. The relationships among these problems will be demonstrated and quantitative chemical principles applied. Special Note: This course is an introduction to environmental chemistry for all science majors.

J. **Course Attributes**: N/A

K. **Prerequisites**: CHEM A106 with grade of C or better.

L. **Test Scores**: N/A

M. **Co-requisites**: N/A

N. **Registration Restrictions**: Instructor approval required.

O. **Course Fee**: No

P. **Stacked With**: CHEM A650

III. **Instructional Goals and Student Learning Outcomes**

A. **Instructional Goals**:

The instructor will:

1. Present chemical models for investigation and develop problem solving and observational skills on problems relevant to current issues and topics in environmental chemistry.
2. Present convergent and divergent questions to initiate discussion on the relevance of current environmental models to: 1) observe and understand natural phenomena, 2) help students differentiate, link and integrate ideas, and develop their own concepts, 3) articulate their thinking and explain models and solutions.
3. Provide multiple historical, cultural, environmental and socially relevant contexts for applying concepts and quantitative skills and invite students to defend and verify their models and their solutions to problems relevant to these contexts.

B. **Student Learning Outcomes**:

Student Learning Outcomes Students will:	Assessment Methods
Solve problems relevant to the origin and evolution of the earth's environment, about human impacts on this environment resulting from energy production and use of the atmosphere, hydrosphere and the biosphere.	Assigned problems and Exam
Use quantitative chemical principles to evaluate the interrelationships of anthropomorphic influences on changes occurring in the atmosphere, hydrosphere and biosphere.	Assigned problems and Exam
Demonstrate appropriate ability to communicate problems and verify solutions.	Assigned problems and Exam
Design and submit a written research proposal testing a hypothesis answering a specific question concerning a current contamination mechanism.	Research Proposal

IV. Course Activities

A. Lecture
B. Assigned problems
C. Exams
D. Research Proposal

V. Guidelines for Evaluation

Students will be evaluated based on their performance on assigned problems, in-class exams, and a research proposal.

VI. Course Level Justification

This course requires extensive multidisciplinary knowledge from biology, chemistry, engineering, mathematics, and physics. It requires the integration of this knowledge to solve multidimensional problems and understand complex concepts.

VII. Course Outline

1. Energy
    a. Energy Flows and Supplies
    b. Fossil Fuels
    c. Nuclear Energy
    d. Renewable Energy
    e. Energy Utilization
2. Atmosphere
    a. Climate
    b. Oxygen Chemistry
    c. Stratospheric Ozone
    d. Air Pollution
3. Hydrosphere / Lithosphere
    a. Water Resources
    b. Water as Solvent
    c. Water and the Lithosphere
    d. Oxygen and Life
    e. Water Pollution and Water Treatment
4. Biosphere
    a. Distribution
    b. Fate

VIII. Suggested Text

Spiro, T.G., Purvis-Roberts, K.L. and Stigliani, W.M., Chemistry of the Environment, 3rd ed. University Science Books, 2012.

IX. Bibliography

1. Brasseur, G.P., Orlando, J.J., and Tyndall, G.S., *Atmospheric Chemistry and Global Change*. Oxford University Press, 1999.

2. Brezonik, P.L.; Arnold, W.A. Water Chemistry: An Introduction to the Chemistry of Natural and Engineered Systems, Oxford University Press. 2011.

3. Hemond, H.F. and Fechner-Levy, E.J., *Chemical Fate and Transport in the Environment*, 2nd ed. Academic Press, 2000.

4. Houghton, J., Global Warming: The Complete Briefing, 4th Edition, Cambridge University Press, 2009.

5. Pankow, J.F., *Aquatic Chemistry Concepts*. Lewis Publishers, 1991.

6. Seinfeld, J.H. and Pandis, S. Atmospheric Chemistry and Physics: From Air pollution to Climate Change, 2nd Edition, 2006, Wiley.

7. Schwarzenbach, R.P., Gschwend, P.M., and Imboden, D.M., *Environmental Organic Chemistry,* 2nd Ed. Wiley Interscience, 2003.

8. Stumm, W. and Morgan, J.J., *Aquatic Chemistry*. Wiley Interscience, 1996.

9. Thibodeaux, L.J., *Environmental Chemodynamics*. Wiley Interscience, 1996.

Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College	1b. Division	1c. Department
AS CAS	AMSC Division of Math Science	Chemistry

2. Course Prefix	3. Course Number	4. Previous Course Prefix & Number	5a. Credits/CEUs	5b. Contact Hours (Lecture + Lab)
CHEM	A677	N/A	5	(3+6)

6. Complete Course Title
Advanced Bioanalytical Chemistry
Adv Bioanalytical Chemistry
Abbreviated Title for Transcript (30 character)

7. Type of Course ☒ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action: ☒ Add *or* ☐ Change *or* ☐ Delete

If a change, mark appropriate boxes:

- ☐ Prefix
- ☐ Credits
- ☐ Title
- ☐ Grading Basis
- ☐ Course Description
- ☐ Test Score Prerequisites
- ☐ Other Restrictions
  - ☐ Class ☐ Level
  - ☐ College ☐ Major
- ☐ Other (please specify)
- ☐ Course Number
- ☐ Contact Hours
- ☐ Repeat Status
- ☐ Cross-Listed/Stacked
- ☐ Course Prerequisites
- ☐ Co-requisites
- ☐ Registration Restrictions
- ☐ General Education Requirement

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

11. Implementation Date semester/year
From: Springl/2014 To: 99/9999

12. ☐ Cross Listed with
☒ Stacked with CHEM A477
Signature Cross-Listed Coordination

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.
Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

Impacted Program/Course	*Date of Coordination*	*Chair/Coordinator Contacted*
1. Interdisciplinary Masters Program	8/28/13	
2.		
3.		

Initiator Name (typed): Mark McCoy Initiator Signed Initials: _____ Date:_____

13b. Coordination Email Date: 8/28/13
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison Date: 8/28/13

14. General Education Requirement *Mark appropriate box:*
☐ Oral Communication ☐ Written Communication ☐ Quantitative Skills ☐ Humanities
☐ Fine Arts ☐ Social Sciences ☐ Natural Sciences ☐ Integrative Capstone

15. Course Description *(suggested length 20 to 50 words)*
Advanced techniques in operating instrumentation and laboratory methods for the analysis of biomolecules. Graduate students will be required to develop a bioanalytical technique in the lab and give a seminar on their findings. Special Note: Not available for credit to students who have completed CHEM A477.

16a. Course Prerequisite(s) *(list prefix and number or test code and score)*

16b. Co-requisite(s) *(concurrent enrollment required)*

16c. Other Restriction(s)
☐ College ☐ Major ☐ Class ☒ Level

16d. Registration Restriction(s) *(non-codable)*
Graduate standing and instructor approval.

17. ☒ Mark if course has fees

18. ☐ Mark if course is a selected topic course

19. Justification for Action
Addition of graduate level course stacked with CHEM A477 for inclusion in the Interdisciplinary Masters Program.

Initiator (faculty only) Date
Mark McCoy
Initiator (TYPE NAME)

☐ Approved
☐ Disapproved Department Chair Date

☐ Approved
☐ Disapproved College/School Curriculum Committee Chair Date

☐ Approved
☐ Disapproved Dean/Director of School/College Date

☐ Approved
☐ Disapproved Undergraduate/Graduate Academic Board Chair Date

☐ Approved
☐ Disapproved Provost or Designee Date

Course Content Guide for **CHEM A677**

University of Alaska Anchorage

College of Arts & Sciences

I. **Date of Initiation:** February 22, 2013

II. **Course Information:**

A. **College:** College of Arts & Sciences

B. **Course Subject:** CHEM

C. **Course Number:** A677

D. **Number of Credits:** 5

E. **Contact Hours:** 3 + 6

F. **Course Title:** Advanced Bioanalytical Chemistry

G. **Grading Basis:** A-F

H. **Implementation Date:** Spring 2014

I. **Course Description:** Advanced techniques in operating instrumentation and laboratory methods for the analysis of biomolecules. Graduate students will be required to develop a bioanalytical technique in the lab and give a seminar on their findings. Special Note: Not available for credit to students who have completed CHEM A477.

J. **Course Attributes:** N/A

K. **Prerequisites:** None.

L. **Test Scores:** N/A

M. **Co-requisites:** N/A

N. **Registration Restrictions:** Graduate standing and instructor approval.

O. **Course Fee:** Yes

P. **Stacked with:** CHEM A477

III. Instructional Goals and Student Learning Outcomes:

A. Course Activities:

Students will explore concepts and solve problems relevant to the latest bioanalytical techniques. Activities will provide students with models or data followed by questions to guide the students through learning. Understanding will be gained through a process emulating the scientific method. In the lecture portion of the course the instructor will guide the students through understanding the fundamental science behind modern and historical bioanalytical methods. Teaching methods may include: lectures, facilitation of class discussions, facilitation of real-time problem solving, and use of the Socratic Method. Laboratory activities will include method development, use of modern analytical equipment, computer assisted data collection, data analysis, statistical analysis, and interpretation of results. Students will also research, develop, and implement a bioanalytical strategy in the laboratory, which will be presented as a short in-class seminar.

B. Instructional Goals:

The instructor will:

1. Present models of molecular interactions between biomolecules with chemicals, substrates, and instrumentation and guide students in learning how these interactions can be applied to modern bioanalytical techniques
2. Present convergent and divergent questions to initiate discussion on relevant scientific problems and how our current discussions could be applied in these cases.
3. Provide multiple historical, cultural, environmental and socially relevant contexts for applying concepts and analytical skills. Invite students to defend or verify their solutions to these problems.
4. Provide students with recent scientific breakthroughs in bioanalytical techniques. Facilitate classroom discussion for understanding of methods.
5. Demonstrate modern bioanalytical techniques in the laboratory. Facilitate student exploration in the laboratory to develop an understanding of the techniques as well as a scientific understanding of the fundamental concepts.
6. Facilitate the student's exploration into a modern bioanalytical technique that is relevant to their research.

C. Student Learning Outcomes:

Students will solve complex problems related to bioanalytical methods. They will develop an understanding of the fundamental science behind the techniques and gain advanced understanding of how to apply it in the laboratory.

The student will:

1. Apply observation, investigative and problem solving skills to problems relevant to current issues and topics in bioanalytical chemistry.
2. Model laboratory processes as part of the lecture curriculum, after which they perform representative processes in the laboratory.
3. Demonstrate skills in science methodology such as exploring and selecting appropriate models.
4. Apply quality control to the student's own performance in the laboratory with the goal of excellence in performance.
5. Create, communicate, and defend solutions to problems across multiple contexts.
6. Utilize a wide range of laboratory equipment and instrumentation and perform extensive data analysis and interpretation of results.
7. Identify potential methods that could be used for particular analyses and weigh the strengths and weaknesses of each approach.
8. Research a bioanalytical method, develop an experiment, and implement the experiment in the lab.
9. Give a short topic seminar about the developed bioanalytical method including background, methods, and results of laboratory experiments.

D. **Assessment Measures:**

Various assessment tools can be used at the discretion of the instructor, including but not limited to homework, lab reports, take-home exams, in-class exams, quizzes, student discussion participation, and evaluation of independent research and seminar.

E. **Guidelines for Evaluation:**

Evaluation can be based on a variety of instruments such as: evaluation of independent research and seminar, homework, lab reports, take-home exams, in-class exams, quizzes, and student discussion participation.

IV. Course Level Justification:

This course provides students with a more in-depth look at bioanalytical laboratory techniques and advanced methods of analysis. Students learn skills in applied research, verification of research results, and researching and developing new bioanalytical techniques. Verification for comprehension and retention of concepts are performed using appropriate evaluation tools.

V. Topical Course Outline:

1. **Biomolecules**

2. **Chromatography**
   a. Basic principles
   b. Chromatographic techniques of protein separation
   c. Protein isolation and separation in the laboratory

3. **Electrophoresis**
   a. Gel electrophoresis in the laboratory
   b. Capillary electrophoresis in the laboratory

4. **Mass Spectrometry**
   a. Peptide analysis and sequencing in the laboratory

5. **Molecular Recognition**
   a. Antibody based bioassays
   b. ELISA techniques and flow cytometry in the laboratory
   c. Biosensors
   d. DNA arrays

6. **Nucleic Acids**
   a. PCR (RT-PCR in the laboratory)
   b. DNA sequencing
   c. RNA/DNA isolation techniques

7. **Protein Sequencing**

VI. Suggested Texts:

1. Gault, V., McClenaghan, N., *Understanding Bioanalytical Chemistry*, John Wiley & Sons, 2009.

2. Manz, A., Pamme, N., Lossifidis, D., *Bioanalytical Chemistry*, Imperial College Press, 2004.

3. Mikkelsen, S.R., Corton, E., *Bioanalytical Chemistry*, Wiley-Interscience, 2004.

VII. Bibliography:

1. Cunico, R.L., Gooding, K.M., Wehr, T., *Basic HPLC and CE of Biomolecules*, Bay Bioanalytical Laboratory, 1998.

2. Harris, D.C., *Quantitative Chemical Analysis.* W.H. Freeman and Company, 2010.

3. Hermenson, G.T., *Bioconjugate Techniques*, Academic Press, 2008.

4. Skoog, D.A., Holler, F.J., Crouch, S.R., *Principles of Instrumental Analysis*, Brooks Cole Publishers, 2006.

5. Rubinson, K.A., Rubinson, J.F., *Contemporary Instrumental Analysis*, Prentice Hall, 1999.

Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College	1b. Division	1c. Department
AS CAS	AMSC Division of Math Science	Chemistry

2. Course Prefix	3. Course Number	4. Previous Course Prefix & Number	5a. Credits/CEUs	5b. Contact Hours (Lecture + Lab)
CHEM	A477	N/A	5	(3+6)

6. Complete Course Title
Bioanalytical Chemistry

Abbreviated Title for Transcript (30 character)

7. Type of Course ☒ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action: ☒ Add *or* ☐ Change *or* ☐ Delete

If a change, mark appropriate boxes:

- ☐ Prefix
- ☐ Credits
- ☐ Title
- ☐ Grading Basis
- ☐ Course Description
- ☐ Test Score Prerequisites
- ☐ Other Restrictions
  - ☐ Class ☐ Level
  - ☐ College ☐ Major
- ☐ Other (please specify)
- ☐ Course Number
- ☐ Contact Hours
- ☐ Repeat Status
- ☐ Cross-Listed/Stacked
- ☐ Course Prerequisites
- ☐ Co-requisites
- ☐ Registration Restrictions
- ☐ General Education Requirement

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

11. Implementation Date semester/year
From: Spring/2014 To: /

12. ☐ Cross Listed with

☒ Stacked with CHEM A677

Signature Cross-Listed Coordination

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

Impacted Program/Course	*Date of Coordination*	*Chair/Coordinator Contacted*
1. B.S. Chemistry	2/22/2013	Eric Holmberg
2. CHEM A312	2/22/2013	Eric Holmberg
3. CHEM A441	2/22/2013	Eric Holmberg

Initiator Name (typed): Mark McCoy Initiator Signed Initials: _____ Date:_____

13b. Coordination Email Date: 10/3/2013
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison Date: 10/3/2013

14. General Education Requirement *Mark appropriate box:*
- ☐ Oral Communication
- ☐ Written Communication
- ☐ Quantitative Skills
- ☐ Humanities
- ☐ Fine Arts
- ☐ Social Sciences
- ☐ Natural Sciences
- ☐ Integrative Capstone

15. Course Description *(suggested length 20 to 50 words)*
Techniques in operating instrumentation and laboratory methods for the analysis of biomolecules. Special Note: For students in biology, chemistry, and allied fields.

16a. Course Prerequisite(s) *(list prefix and number or test code and score)*
CHEM A312 with minimum grade of C or CHEM A441 with a minimum grade of C.

16b. Co-requisite(s) *(concurrent enrollment required)*

16c. Other Restriction(s)
☐ College ☐ Major ☐ Class ☐ Level

16d. Registration Restriction(s) *(non-codable)*

17. ☒ Mark if course has fees

18. ☐ Mark if course is a selected topic course

19. Justification for Action
Creating an elective course for science majors due to student demand.

Initiator (faculty only) Date
Mark McCoy
Initiator (TYPE NAME)

☐ Approved
☐ Disapproved Department Chair Date

☐ Approved
☐ Disapproved College/School Curriculum Committee Chair Date

☐ Approved
☐ Disapproved Dean/Director of School/College Date

☐ Approved
☐ Disapproved Undergraduate/Graduate Academic Board Chair Date

☐ Approved
☐ Disapproved Provost or Designee Date

Course Content Guide for **CHEM A477**

University of Alaska Anchorage

College of Arts & Sciences

I. **Date of Initiation:** February 22, 2013

II. **Course Information:**

A. **College:** College of Arts & Sciences

B. **Course Subject:** CHEM

C. **Course Number:** A477

D. **Number of Credits:** 5

E. **Contact Hours:** 3 + 6

F. **Course Title:** Bioanalytical Chemistry

G. **Grading Basis:** A-F

H. **Implementation Date:** Spring 2014

I. **Course Description:** Techniques in operating instrumentation and laboratory methods for the analysis of biomolecules. Special Note: For students in biology, chemistry, and allied fields.

J. **Course Attributes:** N/A

K. **Prerequisites:** CHEM A312 with minimum grade of C or CHEM A441 with minimum grade of C.

L. **Test Scores:** N/A

M. **Co-requisites:** N/A

N. **Registration Restrictions:** N/A

O. **Course Fee:** Yes

P. **Stacked with:** CHEM A677

III. Instructional Goals and Student Learning Outcomes:

A. Course Activities:

Students will explore concepts and solve problems relevant to the latest bioanalytical techniques. Activities will provide students with models or data followed by questions to guide the students through learning. Understanding will be gained through a process emulating the scientific method. In the lecture portion of the course the instructor will guide the students through understanding the fundamental science behind modern and historical bioanalytical methods. Teaching methods may include: lectures, facilitation of class discussions, facilitation of real-time problem solving, and use of the Socratic Method. Laboratory activities will include method development, use of modern analytical equipment, computer assisted data collection, data analysis, statistical analysis, and interpretation of results.

B. Instructional Goals:

This course is designed as an advanced laboratory techniques course; it will provide a training base in bioanalytical techniques, which emulates conditions found in research laboratories and industry.

The instructor will:

1. Present models of molecular interactions between biomolecules with chemicals, substrates, and instrumentation and guide students in learning how these interactions can be applied to modern bioanalytical techniques.
2. Present convergent and divergent questions to initiate discussion on relevant scientific problems and how our current discussions could be applied in these cases.
3. Provide multiple historical, cultural, environmental and socially relevant contexts for applying concepts and analytical skills. Invite students to defend or verify their solutions to these problems.
4. Provide students with recent scientific breakthroughs in bioanalytical techniques. Facilitate classroom discussion for understanding of methods.
5. Demonstrate modern bioanalytical techniques in the laboratory. Facilitate student exploration in the laboratory to develop an understanding of the techniques as well as a scientific understanding of the fundamental concepts.

C. Student Learning Outcomes:

Students will solve complex problems related to bioanalytical methods. They will develop an understanding of the fundamental science behind the techniques and gain a basic understanding of how to apply it in the laboratory.

The student will:

1. Apply observation, investigative and problem-solving skills to problems relevant to current issues and topics in bioanalytical chemistry.
2. Model laboratory processes as part of the lecture curriculum, after which the student will perform representative processes in the laboratory.
3. Demonstrate skills in science methodology such as exploring and selecting appropriate models.
4. Apply quality control to the student's own performance in the laboratory with the goal of excellence in performance.
5. Create, communicate, and defend solutions to problems across multiple contexts.
6. Utilize a wide range of laboratory equipment and instrumentation and perform extensive data analysis and interpretation of their results.
7. Identify potential methods that could be used for particular analyses and weigh the strengths and weaknesses of each approach.

D. **Guidelines for Assessment and Evaluation:**

Evaluation can be based on a variety of instruments such as: homework, lab reports, take-home exams, in-class exams, quizzes, student discussion, and participation.

IV. Course Level Justification:

This course provides students with a more in-depth look at bioanalytical laboratory techniques and methods of analysis. Students learn skills in applied research and verification of research results. Verification for comprehension and retention of concepts are performed using appropriate evaluation tools.

V. Topical Course Outline:

1. **Biomolecules**
   a. Proteins
   b. Nucleic Acids
   c. Lipids

2. **Chromatography**
   a. Basic principals
   b. Chromatographic techniques of protein separation
   c. Protein isolation and separation in the laboratory

3. **Electrophoresis**
   a. Gel electrophoresis in the laboratory
   b. Capillary electrophoresis in the laboratory

4. **Mass Spectrometry**
   a. Peptide analysis and sequencing in the laboratory

b. Whole protein analysis
c. MALDI

5. **Molecular Recognition**
   a. Antibody based bioassays
   b. ELISA techniques and flow cytometry in the laboratory
   c. Biosensors
   d. DNA arrays

6. **Nucleic Acids**
   a. PCR (RT-PCR in the laboratory)
   b. DNA sequencing
   c. RNA/DNA isolation techniques

7. **Protein Sequencing**
   a. Edman degradation
   b. Protease and chemical digests with mass spectrometry

VI. Suggested Texts:

1. Gault, V., McClenaghan, N., *Understanding Bioanalytical Chemistry*, John Wiley & Sons, 2009.

2. Manz, A., Pamme, N., Lossifidis, D., *Bioanalytical Chemistry,* Imperial College Press, 2004.

3. Mikkelsen, S.R., Corton, E., *Bioanalytical Chemistry*, Wiley-Interscience, 2004.

VII. Bibliography:

1. Cunico, R.L., Gooding, K.M., Wehr, T., *Basic HPLC and CE of Biomolecules*, Bay Bioanalytical Laboratory, 1998.

2. Harris, D.C., *Quantitative Chemical Analysis.* W.H. Freeman and Company, 2010.

3. Hermenson, G.T., *Bioconjugate Techniques*, Academic Press, 2008.

4. Rubinson, K.A., Rubinson, J.F., *Contemporary Instrumental Analysis*, Prentice Hall, 1999.

5. Skoog, D.A., Holler, F.J., Crouch, S.R., *Principles of Instrumental Analysis*, Brooks Cole Publishers, 2006.

Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College	1b. Division	1c. Department
AS CAS	AMSC Division of Math Science	Chemistry

2. Course Prefix	3. Course Number	4. Previous Course Prefix & Number	5a. Credits/CEUs	5b. Contact Hours (Lecture + Lab)
CHEM	A680		3	(3+0)

6. Complete Course Title
Advanced Nuclear Magnetic Resonance
Adv Nuclear Magnetic Resonance
Abbreviated Title for Transcript (30 character)

7. Type of Course ☒ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action: ☒ Add *or* ☐ Change *or* ☐ Delete

If a change, mark appropriate boxes:

- ☐ Prefix
- ☐ Credits
- ☐ Title
- ☐ Grading Basis
- ☐ Course Description
- ☐ Test Score Prerequisites
- ☐ Other Restrictions
  - ☐ Class ☐ Level
  - ☐ College ☐ Major
- ☐ Other (please specify)
- ☐ Course Number
- ☐ Contact Hours
- ☐ Repeat Status
- ☐ Cross-Listed/Stacked
- ☐ Course Prerequisites
- ☐ Co-requisites
- ☐ Registration Restrictions

9. Repeat Status No # of Repeats 0 Max Credits n/a

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

11. Implementation Date semester/year
From: Spring/2014 To: 99/9999

12. ☐ Cross Listed with

☒ Stacked with CHEM A480 _____ Cross-Listed Coordination
Signature

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.
Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

Impacted Program/Course	*Date of Coordination*	*Chair/Coordinator Contacted*
1. Interdisciplinary Masters Program	08/29/2013	
2.		
3.		

Initiator Name (typed): Vugmeyster Initiator Signed Initials: _____ Date:_____

13b. Coordination Email Date: 8/28/13
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison Date: 8/28/13

14. General Education Requirement
Mark appropriate box:
☐ Oral Communication ☐ Written Communication ☐ Quantitative Skills ☐ Humanities
☐ Fine Arts ☐ Social Sciences ☐ Natural Sciences ☐ Integrative Capstone

15. Course Description *(suggested length 20 to 50 words)*
Advanced nuclear Mmgnetic resonance theory and principles for elucidation of one- and multi-dimensional pulse sequences for structural analysis. Literature will be reviewed with regards to recent applications to biomolecules and soil analysis. Special Note: Not available for credit to students who completed CHEM A480.

16a. Course Prerequisite(s) *(list prefix and number or test code and score)*

16b. Co-requisite(s) *(concurrent enrollment required)*

16c. Other Restriction(s)
☐ College ☐ Major ☐ Class ☒ Level

16d. Registration Restriction(s) *(non-codable)*
Graduate standing and instructor approval.

17. ☐ Mark if course has fees

18. ☐ Mark if course is a selected topic course

19. Justification for Action
Addition of graduate level course stacked with CHEM A480 for inclusion in the Interdisciplinary Masters program.

Initiator (faculty only) Date
Vugmeyster
Initiator (TYPE NAME)

☐ Approved
☐ Disapproved Department Chair Date

☐ Approved
☐ Disapproved College/School Curriculum Committee Chair Date

☐ Approved
☐ Disapproved Dean/Director of School/College Date

☐ Approved
☐ Disapproved Undergraduate/Graduate Academic Board Chair Date

☐ Approved
☐ Disapproved Provost or Designee Date

Course Content Guide for **CHEM A680**

University of Alaska Anchorage

College of Arts and Sciences

I. **Date of Initiation:** February 22, 2013

II. **Course Information**

A. **College**: College of Arts and Sciences

B. **Course Subject**: CHEM

C. **Course Number**: A680

D. **Number of Credits**: 3

E. **Contact Hours**: 3 + 0

F. **Course Title**: Advanced Nuclear Magnetic Resonance

G. **Grading Basis**: A – F

H. **Implementation Date**: Spring 2014

I. **Course Description**: Advanced nuclear magnetic resonance theory and principles for elucidation of one- and multi-dimensional pulse sequences for structural analysis. Literature will be reviewed with regards to recent applications to biomolecules and soil analysis. Special Note: Not available for credit to students who completed CHEM A480.

J. **Course Attributes**: N/A

K. **Prerequisites**: N/A

L. **Test Scores**: N/A

M. **Corequisites**: N/A

N. **Registration Restrictions**: Graduate standing and instructor approval.

O. **Course Fee**: No

P. **Stacked With**: CHEM A480

III. Instructional Goals and Student Learning Outcomes

A. Instructional Goals:

The Instructor will:

1. Present theoretical principles of nuclear magnetic resonance.
2. Describe main experimental approaches.
3. Introduce applications to problems in biological and earth sciences.
4. Introduce emerging experimental approaches.

B. Student Learning Outcomes:

Student Learning Outcomes Students will:	Assessment Methods
Demonstrate understanding of principles of nuclear magnetic resonance spectroscopy.	Quizzes, Exams
Demonstrate knowledge of main experimental approaches.	Quizzes, Exams
Demonstrate key applications to problems in biological and earth sciences through a critical review of literature.	Presentations of research articles

IV. Course Activities

A. Lecture
B. Assignments
C. Analysis of research articles
D. Quizzes
E. Exams

V. Guidelines for Evaluation

Students will be evaluated based on their performance on quizzes, in-class exams and presentations. The grades A – F will be assigned based on a curve that is deemed reasonable by the instructor.

VI. Course Level Justification

This course requires a background in calculus, physical chemistry, and physics. It also requires a great deal of analytical thinking and attention to detail. Additional knowledge of literature database is expected of graduate students.

VII. Course Outline

A. Principles of nuclear magnetic resonance spectroscopy.
   i) classical theory of magnetism based on Bloch equations
   ii) product operator formalism
   iii) introduction to multidimensional NMR
   iv) introduction to relaxation phenomenon

B. Modern experimental techniques in solution and solid state NMR and metabolomics. Suggested examples include
   i) two-dimensional COSY, HSQC, and HMQC pulse sequences
   ii) solid-state line shapes based on dipolar and chemical shift anisotropy interactions
   iii) transverse and longitudinal relaxation experiments
   iv) techniques for detection of quadrupolar nuclei

C. Applications to problems in biological and earth sciences. Examples include bio-molecular structure and function, protein folding, metabolomics, and advanced analysis of soil matrix. The choice of applications is open and is likely to be governed by future advances in the field.

VIII. Suggested Text

1. Freeman Ray, *Spin Choreography: Basic Steps in High Resolution NMR*, New Edition, Oxford University Press 2004.

IX. Bibliography

1. Cavanagh John, Fairbrother Wayne J., Palmer III Arthur G., Skelton Nicholas J., Editors, *Protein NMR Spectroscopy: Principles and Practice*, 2nd Edition, Academic Press 2006.

2. Duer Melinda J., *Introduction to Solid-State NMR Spectroscopy*, Blackwell Publishers 2005.

3. Szyperski Thomas, Atreya Hanudatta S., *Projection NMR Spectroscopy: Theory and Applications*, World Scientific Publishing Company, April 2012.

4. Teng Quincy, *Structural Biology: Practical NMR Applications*, Springer Verlag 2005.

Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College	1b. Division	1c. Department
AS CAS	AMSC Division of Math Science	Chemistry

2. Course Prefix	3. Course Number	4. Previous Course Prefix & Number	5a. Credits/CEUs	5b. Contact Hours (Lecture + Lab)
CHEM	A480	N/A	3	(3+0)

6. Complete Course Title
Nuclear Magnetic Resonance

Abbreviated Title for Transcript (30 character)

7. Type of Course ☒ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action: ☒ Add *or* ☐ Change *or* ☐ Delete

If a change, mark appropriate boxes:

- ☐ Prefix
- ☐ Credits
- ☐ Title
- ☐ Grading Basis
- ☐ Course Description
- ☐ Test Score Prerequisites
- ☐ Other Restrictions
  - ☐ Class ☐ Level
  - ☐ College ☐ Major
- ☐ Other (please specify)
- ☐ Course Number
- ☐ Contact Hours
- ☐ Repeat Status
- ☐ Cross-Listed/Stacked
- ☐ Course Prerequisites
- ☐ Co-requisites
- ☐ Registration Restrictions

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

11. Implementation Date semester/year
From: Spring/2014 To: /9999

12. ☐ Cross Listed with

☒ Stacked with CHEM A680

Signature Cross-Listed Coordination

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

Impacted Program/Course	*Date of Coordination*	*Chair/Coordinator Contacted*
1. MATH A201	2/26/2013	Sam Thiru
2. CHEM A411	2/22/2013	Eric Holmberg
3. PHYS A212	2/22/2013	Jim Pantaleone

Initiator Name (typed): Vugmeyster Initiator Signed Initials: _____ Date:_____

13b. Coordination Email Date: 10/3/2013
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison Date: 10/3/2013

14. General Education Requirement *Mark appropriate box:*
☐ Oral Communication ☐ Written Communication ☐ Quantitative Skills ☐ Humanities
☐ Fine Arts ☐ Social Sciences ☐ Natural Sciences ☐ Integrative Capstone

15. Course Description *(suggested length 20 to 50 words)*
Introduction to nuclear magnetic resonance spectroscopy and basic application to problems in biology and earth sciences.

16a. Course Prerequisite(s) *(list prefix and number or test code and score)*
[MATH A201 and (CHEM A411 or PHYS A212)] with a grade of C or better.

16b. Co-requisite(s) *(concurrent enrollment required)*

16c. Other Restriction(s)
☐ College ☐ Major ☐ Class ☐ Level

16d. Registration Restriction(s) *(non-codable)*

17. ☐ Mark if course has fees

18. ☐ Mark if course is a selected topic course

19. Justification for Action
Creating an elective class for science majors due to student demand.

Initiator (faculty only) Date
Vugmeyster
Initiator (TYPE NAME)

☐ Approved
☐ Disapproved Department Chair Date

☐ Approved
☐ Disapproved College/School Curriculum Committee Chair Date

☐ Approved
☐ Disapproved Dean/Director of School/College Date

☐ Approved
☐ Disapproved Undergraduate/Graduate Academic Board Chair Date

☐ Approved
☐ Disapproved Provost or Designee Date

Course Content Guide for **CHEM A480**

University of Alaska Anchorage

College of Arts and Sciences

I. **Date of Initiation:** February 22, 2013

II. **Course information**

A. **College**: College of Arts and Sciences

B. **Course Subject**: CHEM

C. **Course Number**: A480

D. **Number of Credits**: 3

E. **Contact Hours**: 3+0

F. **Course Title**: Nuclear Magnetic Resonance

G. **Grading Basis**: A – F

H. **Implementation Date**: Spring 2014

I. **Course Description**: Introduction to nuclear magnetic resonance spectroscopy and basic application to problems in biology and earth sciences.

J. **Course Attributes**: N/A

K. **Prerequisites**: [MATH A201 and (CHEM A411 or PHYS A212)] with a grade of C or better.

L. **Test Scores**: N/A

M. **Corequisites**: N/A

N. **Registration Restriction**: N/A

O. **Course Fee**: No

P. **Stacked With**: CHEM A680

III. Instructional Goals and Student Learning Outcomes

A. Instructional Goals:

The instructor will:

1. Present theoretical principles of nuclear magnetic resonance.
2. Describe main experimental approaches to NMR.
3. Introduce applications to problems in biological and earth sciences.

B. Student Learning Outcomes:

Student Learning Outcomes Students will:	Assessment Methods
Demonstrate understanding of principles of nuclear magnetic resonance spectroscopy.	Quizzes, Exams
Demonstrate knowledge of main experimental approaches to NMR.	Quizzes, Exams
Demonstrate critical thinking in applying spectroscopic principles to problems in biological and earth sciences.	Oral presentations, Quizzes

IV. Course Activities

A. Lecture
B. Assignments
C. Oral presentations
D. Quizzes
E. Exams

V. Guidelines for Evaluation

Students will be evaluated based on their performance on quizzes, in-class exams and presentations.

VI. Course Level Justification

This course requires a background in calculus, physical chemistry, and physics.

VII. Course Outline

A. Principles of nuclear magnetic resonance spectroscopy.
B. Modern experimental techniques in solution and solid state NMR and metabolomics.
C. Applications to problems in biological and earth sciences. Examples include bio-molecular structure and function, protein folding, metabolomics, and advanced analysis of soil matrix.

VIII. Suggested Text

1. Freeman Ray, *Spin Choreography: Basic Steps in High Resolution NMR*, New Edition, Oxford University Press 2004. 1st Edition 1998.

IX. Bibliography

1. Cavanagh John, Fairbrother Wayne J., Palmer III Arthur G., Skelton Nicholas J., Editors, *Protein NMR Spectroscopy: Principles and Practice*, 2nd Edition, Academic Press 2006.

2. Duer Melinda J., *Introduction to Solid-State NMR Spectroscopy*, Blackwell Publishers 2005.

3. Szyperski Thomas, Atreya Hanudatta S., *Projection NMR Spectroscopy: Theory and Applications*, World Scientific Publishing Company, April 2012.

4. Teng Quincy, *Structural Biology: Practical NMR Applications*, Springer Verlag 2005.

Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College	1b. Division	1c. Department
AS CAS	AMSC Division of Math Science	CHEMISTRY

2. Course Prefix	3. Course Number	4. Previous Course Prefix & Number	5a. Credits/CEUs	5b. Contact Hours (Lecture + Lab)
CHEM	A690	N/A	1-3	(1-3+0)

6. Complete Course Title
Advanced Lecture Topics in Chemistry
Adv Lecture Topics Chemistry
Abbreviated Title for Transcript (30 character)

7. Type of Course ☒ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action: ☒ Add *or* ☐ Change *or* ☐ Delete

If a change, mark appropriate boxes:

- ☐ Prefix
- ☐ Credits
- ☐ Title
- ☐ Grading Basis
- ☐ Course Description
- ☐ Test Score Prerequisites
- ☐ Other Restrictions
  - ☐ Class ☐ Level
  - ☐ College ☐ Major
- ☐ Other CCG (please specify)
- ☐ Course Number
- ☐ Contact Hours
- ☐ Repeat Status
- ☐ Cross-Listed/Stacked
- ☐ Course Prerequisites
- ☐ Co-requisites
- ☐ Registration Restrictions

9. Repeat Status Yes # of Repeats 11 Max Credits 12

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

11. Implementation Date semester/year
From: Spring/2014 To: 00/9999

12. ☐ Cross Listed with
☒ Stacked with CHEM A490
Signature Cross-Listed Coordination

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.
Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

Impacted Program/Course	*Catalog Page(s) Impacted*	*Date of Coordination*	*Chair/Coordinator Contacted*
1. Interdisciplinary Masters Program		08/28/2013	
2.			
3.			

Initiator Name (typed): Colin McGill Initiator Signed Initials: _____ Date:_____

13b. Coordination Email Date: 8/28/13
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison Date: 8/28/13

14. General Education Requirement
Mark appropriate box:
☐ Oral Communication ☐ Written Communication ☐ Quantitative Skills ☐ Humanities
☐ Fine Arts ☐ Social Sciences ☐ Natural Sciences ☐ Integrative Capstone

15. Course Description *(suggested length 20 to 50 words)*
Advanced coverage of selected lecture topics in chemistry presented at a breadth and depth appropriate for graduate studies. Exposure to the topic will rely extensively on independent review of literature supplemented with text and lecture for references.Special Notes: course prerequisites and corequisites may vary with topic. With changes in topic, course may be repeated for up to 12 credits.

16a. Course Prerequisite(s) *(list prefix and number)*

16b. Test Score(s)

16c. Co-requisite(s) *(concurrent enrollment required)*

16d. Other Restriction(s)
☐ College ☐ Major ☐ Class ☒ Level

16e. Registration Restriction(s) *(non-codable)*
Graduate standing.

17. ☐ Mark if course has fees

18. ☒ Mark if course is a selected topic course

19. Justification for Action
Provide a flexible graduate level curriculum for Interdisciplinary Graduate Students addressing material not taught on a regular basis.

Initiator (faculty only) Date
Colin McGill
Initiator (TYPE NAME)

☐ Approved
☐ Disapproved Department Chairperson Date

☐ Approved
☐ Disapproved Curriculum Committee Chairperson Date

☐ Approved
☐ Disapproved Dean/Director of School/College Date

☐ Approved
☐ Disapproved Undergraduate/Graduate Academic Board Chairperson Date

☐ Approved
☐ Disapproved Provost or Designee Date

Course Content Guide for **CHEM A690**
University of Alaska Anchorage
College of Arts & Sciences

I. **Date of Initiation**: February 22, 2013

II. **Course Information**

A. **College**: College of Arts & Sciences

B. **Course Subject**: CHEM

C. **Course Number:** A690

D. **Number of Credits**: 1-3

E. **Contact Hours:** 1-3 + 0

F. **Course Title**: Advanced Lecture Topics in Chemistry

G. **Grading Basis**: A-F

H. **Implementation Date:** Spring 2014

I. **Course Description**: Advanced coverage of selected lecture topics in chemistry presented at a breadth and depth appropriate for graduate studies. Exposure to the topic will rely extensively on independent review of literature supplemented with text and lecture for references. Special Notes: course prerequisites and corequisites may vary with topic. With changes in topic, course may be repeated for up to 12 credits.

J. **Course Attributes:** N/A

K. **Prerequisites**: N/A

L. **Test Scores:** N/A

M. **Corequisites:** N/A

N. **Registration Restrictions:** Graduate standing.

O. **Course Fee:** No

P. **Stacked With**: CHEM A490

III. **Instructional Goals and Student Learning Outcomes**

A. **Instructional Goals**:

Instructional goals will vary according to topic. An example is provided below for course subtitled "Bioorganic Chemistry and Chemical Biology".

The instructor will:

1. Introduce students to advanced topics concerning the chemical origins of biology emphasizing regulation at the chemical level.
2. Present bioorganic chemistry in an integrated context that relates knowledge from biology, chemistry and modeling to understand macromolecular structure and function.
3. Provide reading assignments from primary literature, and leading in-class discussion that requires critical assessments of the articles by the students.

B. **Student Learning Outcomes:**

Student learning outcomes will vary according to topic.

Student Learning Outcomes – Students will:	Assessment Strategies and Student Artifacts
demonstrate a working knowledge of the chemical basis for the production and function of classic biological macromolecules.	Written reports, In-Class Discussion, Exams
integrate mechanistic arrow pushing in the study of biochemistry and molecular biology.	Written reports, In-Class Discussion, Exams
describe enzyme function and regulation by integrating crystal structure data, NMR data, and classical organic chemistry.	Written reports, In-Class Discussion, Exams
Independently integrate information from the literature to address specific questions concerning the function of classic enzyme systems.	Oral (or written) presentations and in-class discussion work facilitated by the instructor.

IV. **Course Activities**:

A. Lecture

B. Critical reading, analysis and discussion of primary research literature with written (or oral) reports
C. Assigned problems to be worked outside of class
D. Exams
E. Research and/or papers reviewing literature on a current theoretical or practical topic in biochemistry

V. Guidelines for Evaluation

Guidelines for evaluation will vary according to topic. An example is provided below for course subtitled "Bioorganic Chemistry and Chemical Biology".

Criteria may include, but are not limited to the following:
A. Three written exams, one of which is a comprehensive final exam
B. Reports (written or oral) on primary literature
C. Research paper
D. Assigned problems

VI. Course Level Justification

Course level justification will vary according to topic. An example is provided below for course subtitled "Bioorganic Chemistry and Chemical Biology".

This is an advanced lecture course in the principles and processes of biochemistry topics emphasizing the mechanistic aspects of function and regulation at the chemical level. Success in the course requires functional knowledge in multiple 300- and 400-level chemistry and biology courses and the ability to integrate this knowledge with data in the literature.

VII. Topic Course Outline

Topic course outline will vary according to topic. An example is provided below for course subtitled "Bioorganic Chemistry and Chemical Biology".

A. Chemical origins of biology
B. DNA and RNA
    a. Structure of nucleotides
    b. Transcription
    c. Translation
C. Peptide and protein structure
    a. Fundamentals of structure
    b. Mechanisms of folding
D. Protein function and regulation at the chemical level
    a. Surface chemistry
    b. Thermodynamics and chemical regulation

E. Glycobiology
    a. Roles of carbohydrates
    b. Regulation
F. Terpenes
    a. Synthesis
    b. Modifications to lipid membranes
G. Chemical control of signal transduction
    a. Transduction basics
    b. Signal cascades

VIII. Suggested Texts

1. Garrett, R.H. and Grisham, C.M., *Biochemistry*, 4th ed. Brooks Cole, 2008.
2. Voet, D. and Voet, J.G., *Biochemistry*, 4th ed. Wiley, 2010.
3. Voet, D., Voet, J.G. and Pratt, C.W., *Fundamentals of Biochemistry: Life at the Molecular Level*, 3rd ed. Wiley, 2008.
4. Vranken, D.V. and Weiss, G., *Introduction to Bioorganic Chemistry and Chemical Biology*. Garland Science, 2012.
5. Wade, L.G., *Organic Chemistry*,8th ed. Pearson, 2012.

IX. Bibliography

1. Alberts, B., Johnson, A., Lewis, J., Raff, M., Roberts, K., and Walter, P., *Molecular Biology of the Cell*. Garland Publishing, 2002.
2. Fersht, A., *Structure and Mechanism in Protein Science: A Guide to Enzyme Catalysis and Protein Folding*. W.H. Freeman and Company, 1999.
3. Scientific Journals such as (not a comprehensive list):
    Biological Chemistry
    Biochemistry
    Biophysical Journal
    Cell
    European Journal of Molecular Biology
    Journal of Biological Chemistry
    Journal of molecular Biology
    Molecular Biology
    Molecular Cell
    Nature
    Nature Structure
    Proceedings of the National Academy of Sciences
    Science

Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College	1b. Division	1c. Department
AS CAS	AMSC Division of Math Science	CHEMISTRY

2. Course Prefix	3. Course Number	4. Previous Course Prefix & Number	5a. Credits/CEUs	5b. Contact Hours (Lecture + Lab)
CHEM	A490	N/A	1-3	(1-3+0)

6. Complete Course Title
Selected Lecture Topics in Chemistry
Selected Lect Topics Chemistry
Abbreviated Title for Transcript (30 character)

7. Type of Course ☒ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action: ☒ Add *or* ☐ Change *or* ☐ Delete

If a change, mark appropriate boxes:

- ☐ Prefix
- ☐ Credits
- ☐ Title
- ☐ Grading Basis
- ☐ Course Description
- ☐ Test Score Prerequisites
- ☐ Other Restrictions
  - ☐ Class ☐ Level
  - ☐ College ☐ Major
- ☐ Other CCG (please specify)
- ☐ Course Number
- ☐ Contact Hours
- ☐ Repeat Status
- ☐ Cross-Listed/Stacked
- ☐ Course Prerequisites
- ☐ Co-requisites
- ☐ Registration Restrictions

9. Repeat Status Yes # of Repeats 11 Max Credits 12

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

11. Implementation Date semester/year
From: Spring/2014 To: /9999

12. ☐ Cross Listed with
☒ Stacked with CHEM A690
Signature Cross-Listed Coordination

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.
Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

Impacted Program/Course	*Catalog Page(s) Impacted*	*Date of Coordination*	*Chair/Coordinator Contacted*
1. B.S. Chemistry		2/22/2013	Eric Holmberg
2.			
3.			

Initiator Name (typed): Colin McGill Initiator Signed Initials: _____ Date:_____

13b. Coordination Email Date: 10/3/2013
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison Date: 10/3/2013

14. General Education Requirement
Mark appropriate box:
☐ Oral Communication ☐ Written Communication ☐ Quantitative Skills ☐ Humanities
☐ Fine Arts ☐ Social Sciences ☐ Natural Sciences ☐ Integrative Capstone

15. Course Description *(suggested length 20 to 50 words)*
Detailed coverage of a selected lecture topic in chemistry presented at a breadth and depth appropriate for upper-division undergraduate science studies. Activities will vary according to the topic. For students in chemistry and allied fields. Special Notes: Course can be repeated for up to 12 credits with a change in subtitle. Prerequisites and corequisites may vary with topic.

16a. Course Prerequisite(s) *(list prefix and number)*

16b. Test Score(s)

16c. Co-requisite(s) *(concurrent enrollment required)*

16d. Other Restriction(s)
☐ College ☐ Major ☒ Class ☐ Level

16e. Registration Restriction(s) *(non-codable)*
Junior or senior standing and instructor approval.

17. ☐ Mark if course has fees

18. ☒ Mark if course is a selected topic course

19. Justification for Action
Provide additional upper-division elective opportunities for undergraduate chemistry students, by student demand.

Initiator (faculty only) Date
Colin McGill
Initiator (TYPE NAME)

☐ Approved
☐ Disapproved Department Chairperson Date

☐ Approved
☐ Disapproved Curriculum Committee Chairperson Date

☐ Approved
☐ Disapproved Dean/Director of School/College Date

☐ Approved
☐ Disapproved Undergraduate/Graduate Academic Board Chairperson Date

☐ Approved
☐ Disapproved Provost or Designee Date

Course Content Guide for **CHEM A490**
University of Alaska Anchorage
College of Arts & Sciences

I. **Date of Initiation**: February 22, 2013

II. **Course Information**

A. **College**: College of Arts & Sciences

B. **Course Subject**: CHEM

C. **Course Number:** A490

D. **Number of Credits**: 1-3

E. **Contact Hours:** 1-3 + 0

F. **Course Title**: Selected Lecture Topics in Chemistry

G. **Grading Basis**: A-F

H. **Implementation Date:** Spring 2014

I. **Course Description**: Detailed coverage of a selected lecture topic in chemistry presented at a breadth and depth appropriate for upper-division undergraduate science studies. Activities will vary according to the topic. For students in chemistry and allied fields. Special Notes: Course can be repeated for up to 12 credits with a change in subtitle. Prerequisites and corequisites may vary with topic.

J. **Course Attributes:** N/A

K. **Prerequisites**: N/A

L. **Test Scores:** N/A

M. **Corequisites:** N/A

N. **Registration Restrictions:** Junior or senior standing and instructor approval.

O. **Course Fee:** No

P. **Stacked With**: CHEM A690

III. Instructional Goals and Student Learning Outcomes

A. Instructional Goals:

Instructional goals will vary according to topic. An example is provided below for course subtitled "Bioorganic Chemistry and Chemical Biology".

The instructor will:

1. Introduce students to the fundamental topics of the chemical origins of biology emphasizing regulation at the chemical level.
2. Encourage knowledge integration by presenting bioorganic chemistry in an integrated context that relates knowledge from biology, chemistry and modeling to understand macromolecular structure and function.
3. Encourage critical thinking by providing reading assignments from primary literature, and leading in-class discussion that requires critical assessments of the articles by the students.

B. Student Learning Outcomes:

Student learning outcomes will vary according to topic. An example is provided below for course subtitled "Bioorganic Chemistry and Chemical Biology".

Student Learning Outcomes – Students will:	Assessment Strategies and Student Artifacts
Be able to demonstrate a working knowledge of the chemical basis for the production and function of classic biological macromolecules.	Assigned problems, Written (or oral) presentations on the topic, Exams
Be able to integrate mechanistic arrow pushing in the study of biochemistry and molecular biology.	Assigned problems, Written (or oral) presentations on the topic, Exams
Be able to describe enzyme function and regulation by integrating crystal structure data, NMR data, and classical organic chemistry.	Assigned problems, Written (or oral) presentations on the topic, Exams
Actively participate in and contribute to in-class discussion of primary research literature.	Attendance and participation in lecture, Participation in discussion of primary literature demonstrating due diligence prior to discussion.

IV. **Course Activities**:

A. Lecture and in-class discussion
B. Critical reading, analysis and discussion of primary research literature with written (or oral) reports
C. Assigned problems to be worked outside of class
D. Exams
E. Research and/or papers reviewing literature on a current theoretical or practical topic in biochemistry

V. **Guidelines for Evaluation**

A. At least 3 written exams, one of which is a comprehensive final exam
B. Reports (written or oral) on primary literature
C. Research paper
D. Attendance and participation in discussion

VI. **Course Level Justification**

This course builds upon a foundation of knowledge established in 300-level chemistry and biology courses.

VII. **Topical Course Outline**

Topics will vary according to subtitle. An example is provided below for course subtitled "Bioorganic Chemistry and Chemical Biology".

A. Chemical origins of biology
B. DNA and RNA
C. Peptide and protein structure
D. Protein function and regulation at the chemical level
E. Glycobiology
F. Terpenes
G. Chemical control of signal transduction

VIII. **Suggested Texts**

1. Garrett, R.H. and Grisham, C.M., *Biochemistry*, 4th ed. Brooks Cole, 2008.
2. Voet, D., Voet, J.G. and Pratt, C.W., *Fundamentals of Biochemistry: Life at the Molecular Level*, 3rd ed. Wiley, 2008.
3. Voet, D. and Voet, J.G., *Biochemistry*, 4th ed. Wiley, 2010.
4. Vranken, D.V. and Weiss, G., *Introduction to Bioorganic Chemistry and Chemical Biology*. Garland Science, 2012.
5. Wade, L.G., *Organic Chemistry*,8th ed. Pearson, 2012.

IX. **Bibliography**

1. Alberts, B., Johnson, A., Lewis, J., Raff, M., Roberts, K., and Walter, P., *Molecular Biology of the Cell*. Garland Publishing, 2002.
2. Fersht, A., *Structure and Mechanism in Protein Science: A Guide to Enzyme Catalysis and Protein Folding*. W.H. Freeman and Company, 1999.
3. Scientific Journals such as (not a comprehensive list):
   Biological Chemistry
   Biochemistry
   Biophysical Journal
   Cell
   European Journal of Molecular Biology
   Journal of Biological Chemistry
   Journal of molecular Biology
   Molecular Biology
   Molecular Cell
   Nature
   Nature Structure
   Proceedings of the National Academy of Sciences
   Science

Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College	1b. Division	1c. Department
AS CAS	AMSC Division of Math Science	Chemistry

2. Course Prefix	3. Course Number	4. Previous Course Prefix & Number	5a. Credits/CEUs	5b. Contact Hours (Lecture + Lab)
CHEM	A698	reinstate	1-6	(0+3-18)

6. Complete Course Title
Graduate Research

Abbreviated Title for Transcript (30 character)

7. Type of Course ☒ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action: ☐ Add *or* ☒ Change *or* ☐ Delete

If a change, mark appropriate boxes:

- ☐ Prefix
- ☒ Credits
- ☒ Title
- ☒ Grading Basis
- ☒ Course Description
- ☐ Test Score Prerequisites
- ☒ Other Restrictions
  - ☐ Class ☒ Level
  - ☐ College ☐ Major
- ☐ Other (please specify)
- ☐ Course Number
- ☒ Contact Hours
- ☒ Repeat Status
- ☐ Cross-Listed/Stacked
- ☐ Course Prerequisites
- ☐ Co-requisites
- ☒ Registration Restrictions

9. Repeat Status Yes # of Repeats Max Credits 12

10. Grading Basis ☐ A-F ☒ P/NP ☐ NG

11. Implementation Date semester/year
From: Springl/2014 To: 99/9999

12. ☐ Cross Listed with
☐ Stacked with

Cross-Listed Coordination Signature

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.

Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

Impacted Program/Course	*Date of Coordination*	*Chair/Coordinator Contacted*
1. Interdisciplinary Masters Program	08/28/2013	
2.		
3.		

Initiator Name (typed): Vugmeyster Initiator Signed Initials: _____ Date:_____

13b. Coordination Email Date: 8/28/13
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison Date: 8/28/13

14. General Education Requirement
Mark appropriate box:
☐ Oral Communication ☐ Written Communication ☐ Quantitative Skills ☐ Humanities
☐ Fine Arts ☐ Social Sciences ☐ Natural Sciences ☐ Integrative Capstone

15. Course Description *(suggested length 20 to 50 words)*
Discipline-specific research for graduate students. Topic of study to be approved and directed by a faculty member.
Special Note: May be repeated for a maximum of 12 credits.

16a. Course Prerequisite(s) *(list prefix and number or test code and score)*

16b. Co-requisite(s) *(concurrent enrollment required)*

16c. Other Restriction(s)
☐ College ☐ Major ☐ Class ☒ Level

16d. Registration Restriction(s) *(non-codable)*
Graduate standing . Permission of graduate advisor required.

17. ☒ Mark if course has fees

18. ☐ Mark if course is a selected topic course

19. Justification for Action
Curriculum addition for the Interdisciplinary Masters degree program.

Initiator (faculty only) Date
Vugmeyster
Initiator (TYPE NAME)

☐ Approved
☐ Disapproved Dean/Director of School/College Date

☐ Approved
☐ Disapproved Department Chair Date

☐ Approved
☐ Disapproved Undergraduate/Graduate Academic Board Chair Date

☐ Approved
☐ Disapproved College/School Curriculum Committee Chair Date

☐ Approved
☐ Disapproved Provost or Designee Date

Course Content Guide for **CHEM A698**

University of Alaska Anchorage

College of Arts and Sciences

I. **Date of Initiation:** February 22, 2013

II. **Course Information:**

A. **College**: College of Arts and Sciences

B. **Course Subject**: CHEM

C. **Course Number**: A698

D. **Number of Credits**: 1-6

E. **Contact Hours**: 0 + 3-18

F. **Course Title**: Graduate Research

G. **Grading Basis**: Pass/No Pass

H. **Implementation Date**: Spring 2014

I. **Course Description**: Discipline-specific research for graduate students. Topic of study to be approved and directed by a faculty member. Special Note: May be repeated for a maximum of 12 credits.

A. **Course Attributes**: N/A

B. **Prerequisites**: N/A

C. **Test Scores**: N/A

D. **Corequisites**: N/A

E. **Registration Restriction**: Graduate standing.

F. **Course Fees**: Yes

G. **Stacked With**: N/A

III. Instructional Goals and Defined Outcomes

A. Instructional Goals:

The instructor will mentor the conceptualization, formulation of hypotheses based on observation and literature review, experimental or computational design, methodologies, data analyses using appropriate discipline-specific tools, refinement of hypotheses, integrating results with appropriate literature reports and writing of a research project.

B. Student Learning Outcomes:

Student Learning Outcomes Students will:	Assessment Strategies
Conduct original research in physical sciences under the mentorship of a faculty advisor.	Research projects, Meetings, Scheduled reports, Research paper.
Apply appropriate analyses to generate results suitable for a publishable thesis or scientific papers.	Research projects, Meetings, Scheduled reports, Research paper.
Discuss and assess progress on a research project with faculty research advisor during the semester through regularly scheduled one-on-one meetings.	Research projects, Meetings, Scheduled reports, Research paper.

IV. Course Activities

A. Laboratory / field directed research course meeting 3 hours per week per credit up to 6 credits per semester.
B. One-on-one discussions with a faculty advisor.

V. Guidelines for Evaluation

Course grading is Pass/No Pass. The evaluation methods, while at the discretion of the faculty member teaching the course may include the initiation, continuation and/or successful completion of a graduate research project culminating in suitably publishable results relevant to the thesis research. Assessment is made through regularly scheduled one-on-one meetings between the student and the faculty mentor to address the continuity and degree of progress.

VI. Course Level Justification

Designed as a required course for the interdisciplinary M.S. degree program. This is an advanced research course in the context of formulating working hypotheses, experimental or theoretical design, and selecting appropriate research methodologies.

VII. Course Outline

A. Hypothesis formulation
B. Laboratory or computational experiments
C. Data analysis
D. Critical review of discipline-specific review literature

VIII. Suggested Text

Will vary according to research topic.

IX. Bibliography

Will vary according to research topic.

Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College	1b. Division	1c. Department
EA COE	No Division Code	CASE

2. Course Prefix	3. Course Number	4. Previous Course Prefix & Number	5a. Credits/CEUs	5b. Contact Hours (Lecture + Lab)
EDCN	A643	NA	3	(3+0)

6. Complete Course Title
Grief and Trauma Counseling with Families
Grief & Trauma Counsl Families
Abbreviated Title for Transcript (30 character)

7. Type of Course ☒ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action: ☒ Add *or* ☐ Change *or* ☐ Delete

If a change, mark appropriate boxes:

- ☐ Prefix
- ☐ Credits
- ☐ Title
- ☐ Grading Basis
- ☐ Course Description
- ☐ Test Score Prerequisites
- ☐ Other Restrictions
  - ☐ Class ☐ Level
  - ☐ College ☐ Major
- ☐ Other (please specify)
- ☐ Course Number
- ☐ Contact Hours
- ☐ Repeat Status
- ☐ Cross-Listed/Stacked
- ☐ Course Prerequisites
- ☐ Co-requisites
- ☐ Registration Restrictions
- ☐ General Education Requirement

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☒ A-F ☐ P/NP ☐ NG

11. Implementation Date semester/year
From: Spring/2014 To: /9999

12. ☐ Cross Listed with
☐ Stacked with
Cross-Listed Coordination Signature

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.
Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

Impacted Program/Course	*Date of Coordination*	*Chair/Coordinator Contacted*
1. School of Social Work	10/9/13 courtesy	Beth Sirles
2. Department of Psychology	10/9/13 courtesy	Patt Sandberg
3. UAF School of Education	10/9/13 courtesy	Susan Renes

Initiator Name (typed): Debra Russ/Keith Cates Initiator Signed Initials: _____ Date:_____

13b. Coordination Email Date: 10/10/13
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison Date: 10/10/13

14. General Education Requirement
Mark appropriate box:
☐ Oral Communication ☐ Written Communication ☐ Quantitative Skills ☐ Humanities
☐ Fine Arts ☐ Social Sciences ☐ Natural Sciences ☐ Integrative Capstone

15. Course Description *(suggested length 20 to 50 words)*
Examines essential knowledge for grief and trauma counseling with diverse family structures and cultures. Emphasizes counseling practices and explores family dynamics during the grief and trauma process. Investigates special types of loss including trauma-causing events. Includes a personalized examination of the effects of grief on the development of a counseling orientation.

16a. Course Prerequisite(s) *(list prefix and number or test code and score)*

16b. Co-requisite(s) *(concurrent enrollment required)*

16c. Other Restriction(s)
☐ College ☐ Major ☐ Class ☒ Level

16d. Registration Restriction(s) *(non-codable)*
Graduate Standing

17. ☐ Mark if course has fees

18. ☐ Mark if course is a selected topic course

19. Justification for Action
This course is an elective in the MEd Program in Counselor Education. The course will allow students to deepen their knowledge of family studies. The course is aligned with national standards in the counselor education field and is also a suitable elective for students in other helping professions such as social work and psychology.

Initiator (faculty only) Date
Debra Russ/Keith Cates
Initiator (TYPE NAME)

☐ Approved
☐ Disapproved Department Chair Date

☐ Approved
☐ Disapproved College/School Curriculum Committee Chair Date

☐ Approved
☐ Disapproved Dean/Director of School/College Date

☐ Approved
☐ Disapproved Undergraduate/Graduate Academic Board Chair Date

☐ Approved
☐ Disapproved Provost or Designee Date

Course Content Guide
University of Alaska Anchorage
College of Education

I. Date Initiated: 4/1/13

II. Information for the Course Action Request

College/School:	College of Education
Department:	CASE
Subject:	EDCN
Course Number:	A643
Title:	Grief and Trauma Counseling with Families
Credits:	3
Grading Basis:	A-F
Implementation Date:	Spring 2014
Course Description:	Examines essential knowledge for grief and trauma counseling with diverse family structures and cultures. Emphasizes counseling practices and explores family dynamics during the grief and trauma process. Investigates special types of loss including trauma-causing events. Includes a personalized examination of the effects of grief on the development of a counseling orientation.
Course Prerequisites(s):	None
Test Scores(s):	None
Corequisite(s)	None
Registration Restrictions:	Graduate Status
Course Fee:	☐ Yes ☒ No

III. Instructional Goals, Student Outcomes, and Assessment Procedures

A. Instructional Goals

The instructor will:

1.	Facilitate examination of contemporary issues of grief and trauma-causing events including terminology and processes of grief and trauma in diverse family cultures;
2.	Facilitate reflection of how personal experiences with grief and trauma-causing events impacts professional counseling orientation;
3.	Facilitate analysis of the current research outlining best practices and treatment modalities for working with grief, loss, and trauma in diverse family cultures;
4.	Identify and discuss the impact of individual grief including trauma-causing events on family dynamics;
5.	Motivate exploration of special types of loss.

B. Student Learning Outcomes/Assessment Procedures

	Student Learning Outcomes *Upon successful completion of the course, the student will be able to do the following:*	***Assessment Procedures*** *This outcome will be assessed by one or more of the following:*	***Standards*** *This outcome meets the following program standard(s):*	***Core Values*** *This outcome addresses the following core value:*
1.	Examine and synthesize contemporary literature including terminology and processes of grief including trauma-causing events in diverse family structures and cultures	Reflective Writing, Exam	Essential Knowledge	Intellectual Vitality, Inclusiveness & Equity
2.	Reflect on the impact that personal grief experiences	Grief Self-Assessments, Exercises	Essential Knowledge, Professional Knowledge	Intellectual Vitality

	have on the development of a counseling orientation			
3.	Evaluate and synthesize the current research outlining best practices and treatment modalities for working with grief, loss, and trauma-causing events in diverse family cultures	Reflective Discussion, Exercises, Case Study	Apply Skills, Show Dispositions, Ethical and Legal	Intellectual Vitality, Inclusiveness & Equity, Collaborative Spirit
4.	Synthesize knowledge of individual roles, personalized grief and its impact on family dynamics	Case Study, Class Discussion, Exam	Essential Knowledge, Apply Skills	Intellectual Vitality, Collaborative Spirit
5.	Synthesize and report on a special type of loss of personal interest	Guest Speaker Reflection, Research Paper, Presentation.	Essential Knowledge, Literature and Research	Intellectual Vitality, Leadership

IV. Course Level Justification

Professional standards require that entry-level career preparation to the fields of school and agency counseling be at the graduate level. This course is an elective in a graduate program and the program faculty expect students to have the basic knowledge and skills acquired through baccalaureate-level preparation. The course also requires the ability to interpret and evaluate primary literature in the field. Students will be expected to analyze and articulate independent conclusions.

V. Course Topic Outline

1. Grief and Trauma-Causing Events Concepts Including Terminology and Contemporary Issues

1.1 Bereavement, Trauma, Grief, Loss, Depression
1.2 Lifespan Expected Trauma Events
1.3 Contemporary Unexpected Trauma Events

2. Family Cultures in the Global Context
2.1 Trauma and its Impact on Families
2.2 Cultural Aspects of Grief

3. Personalized Grief
3.1 Models of Mourning, Grief, Death, Trauma
3.2 Uncomplicated Grief vs. Complicated Grief
3.3 Counselor's Own Grief/Trauma
3.4 Training Issues in Grief/Trauma Counseling

4. Grief Counseling Practices
4.1 Grief/Trauma Therapy Models
4.2 Grief/Trauma Therapy Techniques
4.3 Grief/Trauma Therapy Processes

5. Family Subcultures Dynamics
5.1 Death of Child(ren)
5.2 Death of Parent(s)
5.3 Death of Significant Other
5.4 Interrelationship of Death, Culture, and Family Systems

6. Special Types of Loss/Trauma
6.1 Military
6.2 Violence
6.3 Disability Diagnosis
6.4 Substance Abuse
6.5 Chronic/Terminal Illness
6.6 Homicide
6.7 Suicide

VI. Suggested Texts:

Catherall, D. R. (2004). *Handbook of stress, trauma, and the family*. New York, NY: Brunner-Routledge.

Worden, J. W. (2009). *Grief counseling and grief therapy: A handbook for the mental health practitioner* (4th ed.). New York, NY: Springer.

Additional readings from professional journals as required by the instructor.

VII. Bibliography

Ayers, T., Kondo, C., & Sandler, I. (2011). Bridging the gap: Translating a research-based program into an agency-based service for bereaved children and families. In Neimeyer, R., Harris, D., Winokuer, H., & Thornton, G. (Eds.), *Grief and bereavement in contemporary society: Bridging research and practice.* New York, NY: Routledge Press.

Boerner, C. M. (2008). Website will help you explore your compliance culture in terms Kubler-Ross' five stages of grief and other models. *Journal of Health Care Compliance, 10*(2), 37-38.

Breen, L. J., & O'Conner, M. (2010). Acts of resistance: Breaking the silence of grief following traffic death fatalities. *Death Studies, 34*, 30-53. doi: 10.1080/07481180903372384

Catlin, G. (1993). The role of culture in grief. *Journal of Social Psychology, 133*(2), 173-184.

De Groot, M., Neeleman,J., Van De Meer, K., & Burger, H. (2010). The effectiveness of family-based cognitive-behavior grief therapy to prevent complicated grief in relatives of suicide victims: The mediating role of suicide ideation. *Suicide and Life-Threatening Behavior, 40*(5), 425-437. doi: 10.1521/suli.2010.40.5.425

Doka, K., & Martin, T. (2002). *Men don't cry…women do.* Philadelphia, PA: Taylor Francis Group.

Fiorini, J., & Mullen, J. A. (2006). *Counseling children and adolescents through grief and loss.* Champaign, IL: Research Press.

Goldie, P. (2011). Grief: A narrative account. *Ratio, 24*(2), 120 – 137.

Goldman, L. (2005). *Raising our children to be resilient: A guide to helping children Cope with trauma in today's world.* New York, NY: Brunner-Routledge.

Hall, L. (2008). *Counseling military families: What mental health professionals need to know.* New York, NY: Routledge Press.

Johnson, S. M. (2005). *Emotionally focused couple therapy with trauma survivors*. New York, NY: Guilford Press.

Kirwin, K., & Hamrin, V. (2005). Decreasing the risk of complicated bereavement and future psychiatric disorders in children. *Journal of Child and Adolescent Psychiatric Nursing, volume 18*(1), 62-78.

Kubler-Ross, E., & Kessler, D. (2005). *On grief and grieving: Finding the meaning of grief through the five stages of loss.* New York, NY: Scribner.

Lawson, D. M. (2013). *Family violence: Explanations and evidence-based clinical practice*. Alexandria, VA: American Counseling Association.

Levine, P., & Kline, M. (2007). *Trauma through a child's eyes: Awakening the ordinary miracle of healing.* Berkeley, CA: North Atlantic Books.

Lichtenthal, W., Cruess, D., & Prigerson, H. (2004). A case for establishing complicated grief as a distinct mental disorder in DSM-V. *Clinical Psychology Review, 24,* 637-662.

Lopez, S. (2011). Culture as an influencing factor in adolescent grief and bereavement. *Prevention Researcher, 18*(3), 10-14.

Morgan, H., & Roberts, J. (2010). Helping bereaved children and adolescents: Strategies and implications for counselors. *Journal of Mental Health Counseling, 32*(3), 206-217.

Reimers, E. (2011). Primary mourners and next-of-kin: How grief practices reiterate and subvert heterosexual norms. *Journal of Gender Studies, 20*(3), 251-262.

Sandler, I., Ayers, T., & Romer, A. (2002). Fostering resilience in families in which a parent has died. *Journal of Palliative Medicine, 5*(6), 945-956.

Van der Kolk, B., McFarlane, A., & Weisaeth, L. (Eds.). (1996). *Traumatic stress: The effects of overwhelming experience on mind, body, and society.* New York, NY: Guilford Press.

Walijarvi, C. M., Weiss, M., & Weinman, M. L. (2012). A traumatic death support group program: Applying an integrated conceptual framework. *Death Studies, 36*(2), 151-181.

Webb, N. (1993). *Helping bereaved children: A handbook for practitioners.* New York, NY: Guilford Press.

Wender, E. (2012). Supporting the family after the death of a child. *Pediatrics, 130*(6), 1164-1169. doi: 10.1542/peds.2012-2772

Werner-Lin, A., & Blank, N. M. (2012-2013). Holding parents so they can hold their children: Grief work with surviving spouses to support parentally bereaved children. *Omega, 66*(1), 1-16.

Worden, W. (1996). *Children and grief: When a parent dies.* New York, NY: The Guilford Press.

Course Action Request
University of Alaska Anchorage
Proposal to Initiate, Add, Change, or Delete a Course

1a. School or College	1b. Division	1c. Department
EA COE	No Division Code	CASE

2. Course Prefix	3. Course Number	4. Previous Course Prefix & Number	5a. Credits/CEUs	5b. Contact Hours (Lecture + Lab)
EDCN	A695F		3-6	(1+15-30)

6. Complete Course Title
Counseling Internship: Marriage/Family
Counsl Intern: Marriage/Family
Abbreviated Title for Transcript (30 character)

7. Type of Course ☒ Academic ☐ Preparatory/Development ☐ Non-credit ☐ CEU ☐ Professional Development

8. Type of Action: ☒ Add *or* ☐ Change *or* ☐ Delete

If a change, mark appropriate boxes:

- ☐ Prefix
- ☐ Credits
- ☐ Title
- ☐ Grading Basis
- ☐ Course Description
- ☐ Test Score Prerequisites
- ☐ Other Restrictions
  - ☐ Class ☐ Level
  - ☐ College ☐ Major
- ☐ Other (please specify)
- ☐ Course Number
- ☐ Contact Hours
- ☐ Repeat Status
- ☐ Cross-Listed/Stacked
- ☐ Course Prerequisites
- ☐ Co-requisites
- ☐ Registration Restrictions

9. Repeat Status No # of Repeats Max Credits

10. Grading Basis ☐ A-F ☒ P/NP ☐ NG

11. Implementation Date semester/year
From: Spring/2014 To: /9999

12. ☐ Cross Listed with
☐ Stacked with
Cross-Listed Coordination Signature

13a. Impacted Courses or Programs: List any programs or college requirements that require this course.
Please type into fields provided in table. If more than three entries, submit a separate table. A template is available at www.uaa.alaska.edu/governance.

Impacted Program/Course	*Catalog Page(s) Impacted*	*Date of Coordination*	*Chair/Coordinator Contacted*
1. UAA School of Social Work	courtesy notification	10/10/13	Beth Sirles
2. UAA Department of Psychology	courtesy notification	10/10/13	Patt Sandberg
3. UAF School of Education	courtesy notification	10/1013	Susan Renes

Initiator Name (typed): Debra Russ/Keith Cates Initiator Signed Initials: _____ Date:_____

13b. Coordination Email Date: 10/10/13
submitted to Faculty Listserv: (uaa-faculty@lists.uaa.alaska.edu)

13c. Coordination with Library Liaison Date: 10/10/13

14. General Education Requirement
Mark appropriate box:
☐ Oral Communication ☐ Written Communication ☐ Quantitative Skills ☐ Humanities
☐ Fine Arts ☐ Social Sciences ☐ Natural Sciences ☐ Integrative Capstone

15. Course Description *(suggested length 20 to 50 words)*
Provides supervised counseling in an approved setting that emphasizes marriage and/or family counseling.
Special Notes: Students must apply for placement in advance. Students are expected to have adequate academic preparation in family counseling. See advisor for deadlines and procedures.

16a. Course Prerequisite(s) *(list prefix and number)*
EDCN A627, EDCN A637, EDCN A680, EDSE A632

16b. Test Score(s)

16c. Co-requisite(s) *(concurrent enrollment required)*

16d. Other Restriction(s)
☐ College ☐ Major ☐ Class ☒ Level

16e. Registration Restriction(s) *(non-codable)*
Department approval required; Admission to internship.

17. ☒ Mark if course has fees

18. ☐ Mark if course is a selected topic course

19. Justification for Action
The addition of this course will allow students interning at a marriage and/or family center to have it noted on their transcript. This designation may benefit students seeking credentials in family counseling inside/outside Alaska.

Initiator (faculty only) Date
Debra Russ/Keith Cates
Initiator (TYPE NAME)

☐ Approved
☐ Disapproved Department Chairperson Date

☐ Approved
☐ Disapproved Curriculum Committee Chairperson Date

☐ Approved
☐ Disapproved Dean/Director of School/College Date

☐ Approved
☐ Disapproved Undergraduate/Graduate Academic Board Chairperson Date

☐ Approved
☐ Disapproved Provost or Designee Date

Course Content Guide
University of Alaska Anchorage
College of Education

Date Initiated: **04/01/13**

II. Information for the Course Action Request

College/School:	College of Education
Department:	CASE
Subject:	EDCN
Course Number:	A695F
Title:	Counseling Internship: Marriage/Family
Credits:	3
Grading Basis:	P/NP
Implementation Date:	Spring 2014
Course Description:	Provides supervised counseling in an approved setting that emphasizes marriage and/or family counseling. Special Notes: Students must apply for placement in advance. Students are expected to have adequate academic preparation in family counseling. See advisor for deadlines and procedures.
Course Prerequisites(s):	EDCN A680, EDCN A627, EDCN A637, EDSE A632
Test Scores(s):	N/A
Corequisite(s)	N/A
Registration Restrictions:	Departmental approval required: Admission to internship
Course Fee:	☒ Yes ☐ No

III. Instructional Goals, Student Outcomes, and Assessment Procedures

A. Instructional Goals

The instructor will:

1.	Monitor student progress in the internship experience;
2.	Approve student's contract for attaining experience and competencies in marriage/family counseling;
3.	Observe student at the internship site;
4.	Facilitate student-led seminars;
5.	Coordinate student presentation and defense of portfolio including convening an evaluation panel;
6.	Evaluate student performance and issue the final grade.

B. Student Outcomes/Assessment Procedures

	Student Learning Outcomes *Upon successful completion of the course, the student will be able to do the following:*	***Assessment Procedures*** *This outcome will be assessed by one or more of the following:*	***Program Standards*** *This outcome aligns with the following program standard:*	***Core Values*** *This outcome aligns with the following College value:*
1.	Articulate personalized goals for the internship experience	Internship Goals	Essential Knowledge	Intellectual Vitality
2.	Coordinate internship meetings at site	Internship Contract	Professional Development	Collaborative Spirit
3.	Identify and accurately report critical incidents, and concerns to university instructor	Weekly Progress Reports, Time Logs, Evaluation of Site Form	Ethical and Legal	Leadership
4.	Lead discussion on a professional topic encountered during practice	Seminar Facilitation	Ethical and Legal	Leadership
5.	Demonstrate marriage/family counseling skills	Skill Demonstration and Performance Reflection; Site Supervisor Evaluation	Apply Skills	Inclusiveness and Equity
6.	Document attainment of competencies in marriage/family counseling	Portfolio Presentation and Defense	Apply Skills, Professional Development	Intellectual Vitality, Leadership

IV. Course Level Justification

National standards require that entry-level career preparation to the fields of school and community counseling be at the graduate level. This course is part of a graduate program and the program faculty expect students to have the advanced knowledge and skills acquired through core curriculum in counselor education.

V. Course Outline

1. Internship goals

   1.1 Communicate essential knowledge and understandings of the profession of counseling including an ability to integrate knowledge into personally meaningful frameworks;
   1.2 Apply practical knowledge that is developmentally appropriate to individuals and groups in multicultural contexts;
   1.3 Utilize individual and group approaches to assessment and evaluation to support and improve counseling practices in multicultural contexts;
   1.4 Show dispositions relating to effective counseling practices for diverse populations;
   1.5 Engage in work that meets ethical standards and legal mandates in the field of counseling;
   1.6 Communicate essential knowledge and understanding of career development and related life issues;
   1.7 Utilize professional literature, research methods, and program evaluation to support and improve counseling practices;
   1.8 Communicate essential knowledge of and skills in effective group counseling practice including theoretical and experiential understanding of group approaches in a multicultural society;
   1.9 Create a plan for continued professional development in a counseling specialty area.

2. Practical experiences (Note: Specific activities will vary by student and site)
   - 2.1 Observations/Co-facilitate/Lead
     - 2.1a Intake
     - 2.1b Parenting education groups
     - 2.1c Record keeping
     - 2.1d Family planning
     - 2.1e Curriculum development
     - 2.1f Responsive services
     - 2.1g System support
     - 2.1h Referral coordination
     - 2.1i Advisement
     - 2.1j Short-term counseling
     - 2.1k Appraisal
     - 2.1l Community engagement

3. Seminar activities
   - 3.1 Gather information on professional topics

3.2 Lead discussions with peers
3.3 Role play scenarios
3.4 Report on intern activities including challenges
3.5 Offer and accept feedback from instructor and peers

4. Portfolio
   4.1 Create artifacts
   4.2 Present portfolio
   4.3 Answer panel questions
   4.4 Revise portfolio

VI. Suggested Text(s)

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Curriculum Handbook text regarding stacked courses:

p. 3: 2.1.2 Academic Considerations Addressed in Review
The faculty member initiating the curriculum action should be prepared to address the following and any other appropriate issues that members of the curriculum review committees may ask when the curriculum action is presented to the appropriate boards/committees at each level of review.

A. Academic considerations for a new course proposal:
   v. Justification for stacking or cross listing

p. 46-48: Section 9 - Step-By-Step Instructions for the Course Content Guide
When developing a new course the CCG should be developed first. Considerations are: level, title, goals and student learning outcomes, content, and bibliography. This information is then transferred to the CAR. The Course Content Guide should provide a concise description of the course.

I. Stacking (if applicable)
   i. Stacked courses are courses from the same prefix but at different levels offered at the same time and location.
   ii. Existing and new courses may not be stacked unless approved as stacked courses by UAB/GAB.
   iii. Courses may not be stacked informally for scheduling purposes.
   iv. The course description and course content guide of a stacked course must clearly articulate the difference in experience, performance and evaluation of students at different levels, including graduate students vs. undergraduate students.
   v. Courses that are at the 500 level may not be stacked with any other course.
   vi. If stacking status is requested, rationale must be provided.
   vii. Courses at the 300 level may not be stacked with 600-level courses.

All graduate-level courses must meet certain criteria established by the GAB. In addition, when 400-level courses are stacked with 600-level courses, the faculty initiator must consider the impact of stacking the course on the graduate student experience and how that affects the criteria for 600-level courses. If a graduate-level course is stacked with a 400-level course, or if undergraduate students are taking the course as part of their baccalaureate degree, the justification must clearly describe how the quality of the graduate students' experience will be maintained in a mixed-level classroom.

The following guidelines may assist in determining whether a course is suitable for stacking according to graduate criteria:

i. Do the prerequisites (not registration restrictions) differ for the 400- vs. 600-level versions of the course?
It is difficult to justify stacked courses in which the graduates and undergraduates have a significantly different knowledge base relevant to the course material. If the knowledge is required for the course, the prerequisites must be comparable. If the knowledge is only required for extra coursework performed by the graduate students, this difference should

be stated explicitly and addressed in the instructional goals, student learning outcomes and course activities sections of the CCG.

ii. Is the course format predominantly discussion- or seminar-based?

This type of course is not likely to be suitable for stacking, as the discussion level/theoretical base can differ significantly between graduate and undergraduate students. In addition, the ratio between undergraduate and graduate students should be addressed. Courses that are evenly divided may provide a more balanced environment than a course in which only one or two graduate students are present.

iii. Is the course format predominantly lecture-based? (Is the main intent of the course to provide a detailed knowledge set?)

a. Is the PRIMARY source of information/reading the primary research literature of the field?

This course is not likely to be suitable for stacking, as undergraduate students generally lack the knowledge base and experience to derive all information from the primary literature.

b. Is the PRIMARY source of information/reading material derived from textbooks or other less-specialized literature?

This course is likely to be suitable for stacking. However, the performance expectations for graduate students should be explicitly defined, with special emphasis on how these expectations differ from the 400-level students.

Some suggested student learning outcomes/assessments that may be appropriate for 600-level students in a stacked course:

i. Extra reading assignments based in the primary research literature, evaluated via written critical reviews and/or oral presentations

ii. Extra writing assignments that evince ability to synthesize research fields (comprehensive scholarly reviews or synthesis of other disciplinary areas with the course material)

iii. Assignments to measure the ability of graduate students to integrate course material into experimental design, such as writing formal research grant proposals, or oral or written presentation of how the course material informs the student's own thesis research

iv. Separate exams for graduate students that measure not only comprehension of the lecture material but the ability to integrate and apply the material at more advanced levels, such as hypothesis formulation and experimental design, or the ability to interpret raw research data

v. Teaching experiences, in which graduate students instruct undergraduates, lead discussion groups or present analysis of primary research, offer another context in which graduate students may demonstrate and more advanced knowledge and be assessed accordingly.

As a result of completing this course, students will be able to:

As a result of completing this course, students will be able to:

Student Learning Outcomes	Typical Assessments
demonstrate the ability to conduct a literature search on the course	written critical reviews and/or oral presentation of literature reviews

topic material	
Synthesize research fields	comprehensive scholarly reviews or synthesis of other disciplinary areas with the course material produced by the student
Integrate course material into experimental design	Written formal research grant proposals, oral or written presentation of the how the course material informs the student's own thesis research
Integrate and apply the course material at advanced levels	Exams requiring students to formulate hypothesis, design experiments, or interpret raw research data
Instruct undergraduates, lead discussion groups, or otherwise present the course material to other audiences.	Observed teaching exercises, teaching evaluations, performance of their students on examinations

p. 61: CAR Box 12.

2. Stacked

A. Stacked courses are courses from the same prefix but at different levels offered at the same time and location.

B. Existing and new courses may not be stacked unless approved as stacked courses by UAB/GAB.

C. Courses may not be stacked informally for scheduling purposes.

D. The course description and course content guide of a stacked course must clearly articulate the difference in experience, performance, and evaluation of students at different levels, including graduate students vs. undergraduate students.

E. Courses at the 300 level may not be stacked with 600-level courses.

F. A500-A599 level (professional development) courses may not be stacked with any other course

G. If stacking status is requested, rationale must be provided.

If the graduate-level course is stacked with a 400-level course, or if undergraduate students are taking the course as part of their baccalaureate degree, the justification must clearly describe how the quality of the graduate students' experience will be maintained in a mixed-level classroom. (See Section 9 for guidance on the CCG.)