

Missouri State University
CURRICULAR PROPOSAL
NEW COURSE (or new REGULAR SECTION of an existing variable content course)

Department Biology

Date January 7, 2013

Check one: New COURSE New REGULAR (i.e. permanent) SECTION of an existing variable content course. If a new regular section of an existing variable topics course, to what existing course is it to be attached? _____

PROPOSED CATALOG DESCRIPTION

BIO 111 Understanding Biological Systems through Inquiry

Physiological

Prerequisite or corequisite: BIO 101. General Education Course (Natural World). A laboratory course that partially fulfills the general education requirement in the Life Sciences. Organisms are studied from their behavioral, ecological, hereditary and evolutionary perspectives. Students will develop skills of gathering information about science, reasoning scientifically from that information and synthesizing responses to questions based upon that information in order to explain biological phenomena. May not be counted for credit toward a biology degree. 1(0-2) F,S,Su

PURPOSE OF COURSE

The new general education program requires 7 hours in the natural sciences instead of 8 hours. In response, the 4 hour general education lecture and lab course, BIO 102, will be replaced by a 3 hour lecture only course and an optional 1 hour lab only course. This proposal is to create the one hour lab only course for general education.

RELATIONSHIP TO OTHER DEPARTMENTS

All MSU students are required to complete in a breath of knowledge course in the life sciences.

DEPARTMENT: Route according to ART VI, SEC 3B(1-4) of Bylaws of the Faculty. Attach New Course Resource Information form (FS 300a/05) and forward three typed, originally signed forms to one of the following (please check all that apply and send to first council/committee marked). If the course needs to go through more than one council/committee forward one additional form for each additional council/committee marked.

College Council

(All new course proposals numbered 100-599 must go through College Council first. After approval, College Council will forward appropriate number of copies to the next committee/ council or directly to the Faculty Senate if no further committee approval is needed.)

Professional Education Committee

(Considers all new courses affecting BS and MS in Education and Educational Specialist degrees)

Committee on General Education and Intercollegiate Programs

(Considers all general education and multi-college new course proposals)

Graduate Council

(Considers all 600-, 700-, and 800-level new courses)

If the course needs to go through more than one council/committee, forward one additional form for each additional council/committee marked.

Signature *A. Mathis*
Department Head

Date 1-8-13

(Routing on Reverse Side)

NEW COURSE RESOURCE INFORMATION

Department Biology

Date January 7, 2013

Course Number and Title BIO 111 Understanding Biological Systems through Inquiry

Anticipated Average Enrollment 350/semester Maximum Enrollment Limit 24/section

Faculty Load Assignment 2 Equated Hours

1 Is another course being deleted? If so, give course number and title.

The 4 hour general education lecture and lab course, BIO 102, will be replaced by a 3 hour lecture only course and an optional 1 hour lab only course. This proposal is to create the one hour lab only course for general education.

2 What will this course require in the way of:

Additional library holdings? No

Additional computer resources? No

Additional or remodeled facilities? No

Additional equipment or supplies? No

Additional travel funds? No

Additional faculty--general vs specialized? No

Other additional expenses? No

3 If additional faculty are not required, how will faculty be made available to teach this course?

Faculty that currently teach BIO 102 labs will teach the BIO 111 labs.

List names of current faculty qualified to teach this course:

All faculty and instructional staff in the Biology Department are qualified to teach this course.

4 What is the anticipated source of students for this course? (If from within the department, will students be taking this course in addition to or in place of other courses? If from outside the department, which courses in other departments would most likely be affected?)

All MSU students are required to complete in a breath of knowledge course in the life sciences.

5 Other comments:

Understanding Biological Systems through Inquiry - Biology 111 (1 credit hour)

Course Syllabus and Policy Statement

Catalog Course Description: Prerequisite or corequisite: BIO 101. General Education Course (Natural World). A laboratory course that partially fulfills the general education requirement in the Life Sciences. Organisms are studied from their behavioral, ecological, hereditary and evolutionary perspectives. Students will develop skills of gathering information about science, reasoning scientifically from that information and synthesizing responses to questions based upon that information in order to explain biological phenomena. May not be counted for credit toward a biology degree. 1(0-2)
F,S,S

Goal of the course: To explore biology through scientific investigations.

Student Learning Goals:

1. Students will develop understandings of the ways in which chemical reactions and physical processes are integral to biological systems.
2. Students will develop understandings of living systems at the molecular, cellular, organismal, community and ecological levels.
3. Students develop skills of gathering information about science, reasoning scientifically from that information and synthesizing responses to questions based upon that information in order to explain biological phenomena.
4. Students will learn about cultural and ethical issues concerning environmental conservation and applications of biotechnology.
5. Students will critically examine their views concerning environmental conservation and applications of biotechnology.

General Education Assessment:

1. Students will demonstrate their understanding of living systems by describing their nature, organization and evolution through their answers to exam questions. (General Goal 10:1)
2. Students will demonstrate their understanding of the processes by which scientific knowledge of living things is generated through the reports of their experimentation. (General Goal 10:2)
3. Students will demonstrate their knowledge of living things through hypothesis testing and the ability to draw defensible conclusions regarding living things through the reports of their experimentation. (General Goal 10:3)
4. Students will demonstrate the ability to make logical connections between key concepts in the life sciences and describe the interaction between human lives and other living things through their answers to exam questions. (General Goal 10:4)
5. Students will demonstrate their understanding the ways the environment impacts humanity and how human actions affect the environment through the reports of their environmental conference projects. (General Goal 10:6)

Important Notice to Biology 111 Students

*This handout includes a schedule and the policies by which the laboratory will be conducted. It is your responsibility to know and understand these policies and to abide by them. Acceptance of this document and continued enrollment in Biology 111 constitutes acknowledgment that you have read and understood these policies. **Keep this handout to refer to throughout the semester.***

Lab Procedures

1. Prior to attending the first laboratory period, you must obtain a new copy of the laboratory manual, *Doing Biology*, by Dewey, Saunders, Hopper, and Herring. This contains the lab exercises that you will complete during the semester.
2. Read each lab exercise prior to the appropriate lab meeting. The pages are noted in this syllabus. You can make better use of your lab time and do well on quizzes if you are familiar with the lab questions and procedures before attending lab. Review the Student Reflection questions prior to coming to class to stay focused in the lab.
3. In order to make your lab experience as rewarding as possible, please provide your instructor with notification from the Office of Disability Services if you require special accommodations for any lab activities.
4. Cell phone use/texting is not permitted during lab, as it is disruptive to both students and instructors. If cell phone use occurs, instructors are permitted to collect phones and retain them until the end of the class period.

Lab Assessment

1. In the first two-thirds of the semester, you will be working with a group of students to create a poster and presentation on a local environmental issue. Your group's progress will be assessed at intervals throughout the semester. Your presentation and poster will be assessed and the grade will be given to all of the group members.
2. During last half of the semester, you will also work with a group of students to create a poster and presentation based upon a plant experiment. The poster and presentation will be assessed and the grade will be given to all of the group members. You will prepare a written report, based on your group work, which will be assessed individually.
3. You will be able to assess the contributions of your group members for both of these projects through member evaluations.
4. There will be two lab exams. The midterm lab exam will include concepts from the first half of the semester. The final exam will include concepts from the last half of the semester.
5. There will be twelve quizzes. These quizzes will assess your knowledge of the previous laboratory exercise and your preparation for the upcoming lab exercise.
6. Any assignment that is turned in after the due date will be docked 20% of the total possible grade per day.
7. Any assignment that includes plagiarized material (more than three consecutive words taken from a reference that is not correctly cited) will receive a grade of zero, as will any individual assignment copied from another student.

Lab Attendance

1. **Laboratory attendance is required.** Not only will you miss the information presented in lab (which will be on the exams and on future quizzes), but you also lose

the opportunity to learn from the other lab partners in your group. In addition, some labs will extend over more than one lab period, so you will miss important data and information necessary for group presentations and reports if you are absent.

2. You will be penalized with incremental point deductions (see #5) if you miss a lab without a legitimate problem (see #3), and you will not be able to make up the lab or to take the 10 point quiz over the material covered in the missed lab. Students who leave the laboratory before the period is over will be considered absent and will be penalized as if they had been absent.
3. If you must miss a lab or a lab exam due to a legitimate personal emergency (ex. personal illness or family illness) contact your laboratory instructor before your lab meets, if possible, or **no later than 24 hours after your lab class**, to arrange attending an alternate lab section during the same week. In addition to contacting your instructor by phone or email, you must provide he/she with documents that validate your reason for lab absence. Documentation may be provided by one of the following: a written note from a physician or parent documenting a serious illness or documentation of a family emergency.
4. If you must miss a lab or lab exam due to a university-sponsored activity, you must provide written documentation from an instructor or coach indicating the date/time of the activity and you must make arrangements prior to your absence to attend another lab section.

If you are unable to attend any other lab section during the same week, you must attend the open lab session that is available for that lab unit. Open labs will be held from 3-5 on the Monday of the week following a missed lab. Due to space and equipment constraints, **this is your last chance to make up a missed lab. A maximum of ONE LAB can be "made-up" (with documentation), either by attending an alternate lab or an open lab session, over the course of the semester.**

5. **If a student with an absence does not attend either another section during the same week or the appropriate open lab, he or she will receive incremental point deductions in the following intervals: one missed lab= -25 points, 2 missed labs= -50 points, 3 missed labs= -75 points, and so on. This means that a student will have a permanent failing point value in lab after three labs have been missed.**
6. **Quizzes will be offered during the first 10 minutes of lab.**
 - a) If you are late for class, but the quiz is still being given:
You will have the remaining time to complete the quiz.
 - b) If you arrive after the quiz has been taken:
You will be able to take the quiz, but you must attend an open lab session on the Monday of the following week in order to take a quiz written by a different instructor.
 - c) If you are absent from class for an undocumented reason:

You will be able to take the quiz over the previous lab material, but you must attend an open lab on the Monday of the following week in order to take a quiz written by a different instructor. You will not, however, be able to make up the lab or to take the quiz over the missed lab material.

d) If you are absent from class due to a documented personal emergency, but attend another lab section in the same week:

You will be able to take the quiz over the previous lab material with the rest of the students in the alternate lab section that you attend. You will be able to take the quiz over the new lab with the rest of the students in your next normally-scheduled lab class, as long as you have both of the following in your lab handbook: the approval signature of the alternate lab instructor and complete answers/notes for the material covered in the alternate lab section.

e) If you are absent from class due to a documented personal emergency, but attend the open lab session offered on the Monday of the following week:

You will be able to take a quiz over the previous lab material (written by a different instructor) during the open lab session. You will be able to take the quiz over the new lab (the one that has been made up) with your instructor during your next regular lab class.

Extra Study Opportunities and Extra Credit

1. Students are always welcome to attend the Monday open lab sessions for extra help with lab concepts. An instructor will be available to help you with your questions.
2. A midterm review session will be held in the week during which the midterm is given. Instructors will be available to help you with any questions over lab material that you might have.
3. During the weeks of the plant lab unit, the plant stations in Temple 203 and 213 will be open to students for further study. The times during which the labs will be open will be announced during the first week of the plant unit lab.
4. There will be several opportunities for extra credit throughout the semester. Extra credit awards are given for the best poster of the lab section, the best presentation of the lab section, and for asking questions of other presenting groups during both the environmental conference and plant design projects.
5. Extra credit will also be given for attending seminars and thesis presentations within our department. Such opportunities will be announced in lab as they arise.

Biology 111 Lab Syllabus: Fall 2012

Lab	Dates	Lab Name	Assignment	Pts
	8/23	Introduction to Scientific Methods	Read pages v-xiii in <i>DI</i> .	
E	8/30	Cell Diversity	Read pages 39-62 in <i>DI</i> . Quiz on Intro. to Sci. Methods Lab	10
C	9/6	Diffusion and Osmosis	Read pages 23-29 in <i>DI</i> . Quiz on Lab E	10
D	9/13	Capturing and Transforming Energy	Read pages 31-38 in <i>DI</i> . Quiz on Lab C	10
I	9/20	Biotechnology	Read pages 71-83 in <i>DI</i> .	10

			Quiz on Lab D Conf. Assign. #1: Topic ID, p. 119-121	10 5
F	9/27	Cell Differentiation	Read pages 93-99 in <i>DI</i> . Quiz on Lab I Protist (Lab E) Notes	10 10
G	10/4	Genetics	Read pages 107-118 in <i>DI</i> . Quiz on Lab F	10
	10/11	<i>Midterm Exam</i>		50
			Conf. Assign. #3: First Draft, p. 127-130	15
	10/18	FALL BREAK	No BIO 111 labs will be held this week.	
K	10/25	Biological Monitoring	Read pages 85-92 in <i>DI</i> . <i>Quiz – Prelab for Lab K</i>	10
B	11/1	Comparative Anatomy	Read pages 15-22 in <i>DI</i> . Quiz on Lab K	10
A	11/8	Human Physiology Begin Plant Experiment	Read pages 1-13 in <i>DI</i> . Quiz on Lab B Plant Exp. Planning Worksheet	10 5
L	11/15	Environmental Conference (Presentations) Measure and Water Plants	Read pages 119-142 in <i>DI</i> . Quiz on Lab A Conf. Assign. #4: Final Draft, p. 131-134 Conf. Assign. #5: Presentation, p. 135-138 Conf. Assign. #5: Poster, p. 135-138 Peer Participation Evaluation, p. 139-142	10 10 15 20 5
	11/22	THANKSGIVING BREAK	No BIO 111 labs will meet this week.	
M	11/29	Plant Experiment Measure and Water Plants	Read pages 143-169 in <i>DI</i> . <i>Bring textbook to lab.</i> <i>Quiz – Prelab for Lab M</i>	10
M	12/6	Plant Experiment	Plant Station Notes Quiz on Lab M Plant Experiment Data Plant Experiment Presentation, p. 154-156 Individual Plant Exp. Report, p. 157-158 Peer Participation Evaluation, p. 159-162	20 20 15 20 25 5
	TBA	Final Examination – See Final Exam Schedule for your assigned time.		50

400 Possible Points from the Laboratory

Protist Notes: 10

Lab Quizzes: 130

1 @ 15 points each 20

11 @ 10 points each 110

Environmental Conference:	70
Assign. #1 (Topic ID)	5
Assign. #3 (First Draft)	15
Assign. #4 (Final Draft)	10
Assign. #5 (Presentation)	15
Assign. #5 (Poster)	20
Peer evaluation	5
Plant Experiment:	90
Plant Exp. Planning Worksheet	5
Plant Exp. Data	15
Plant Station Notes	20
Presentation	20
Individual report	25
Peer evaluation	5
Midterm Exam	50
Final Exam	50

Additional Policies:

Conduct: In laboratory courses appropriate conduct is particularly important so minimize distractions. During lab I require that you respect the learning environment by behaving responsibly. Appropriate class participation is always welcomed but casual conversations and other inappropriate distractions are rude and very disruptive to other students. If I detect such behavior I will take action to correct the problem. If someone's inappropriate activity is interfering with your ability to concentrate, please let me know, anonymously if you wish.

A new aspect of the conduct issue involves the use of cell phones in classes. The use by students of cell phones, pagers, or similar communication devices during scheduled classes is prohibited. All such devices must be turned off or put in a silent mode and cannot be taken out during class. At the discretion of the instructor, exception to this policy is possible in special circumstances. See <http://www.missouristate.edu/provost/4264.htm> for complete policy.

There are two appeal processes available to students. A sanction for class disruption may be appealed using the appeal process stated in the Class Disruption policy; however, a violation that involves a charge of academic dishonesty must be appealed using the process described in the *Student Academic Integrity Policies and Procedures*. Students have the right to continue attending class while an appeal is in progress.

Special Conditions: My goal is for all students to be successful in my class. If you need instructional modifications of any kind in order to participate in the class, please let me know during the first week of the semester.

Statement on academic dishonesty:

The course goals are designed to prepare you to be more scientifically literate. Accurate assessment of your progress requires that you turn in only original work for lab assignments and that exams be taken without unauthorized assistance. Plagiarism and cheating will not be tolerated. Instances of dishonesty will result in failure of the assignment

and may result in failure of the entire course. I reserve the right to determine if plagiarism or cheating has occurred.

Missouri State University is a community of scholars committed to developing educated persons who accept the responsibility to practice personal and academic integrity. You are responsible for knowing and following the university's student honor code. Student Academic Integrity Policies and Procedures, available at

www.missouristate.edu/policy/academicintegritystudents.htm and also available at the Reserves Desk in Meyer Library. Any student participating in any form of academic dishonesty will be subject to sanctions as described in this policy.

Statement of nondiscrimination:

Missouri State University is an equal opportunity/affirmative action institution, and maintains a grievance procedure available to any person who believes he or she has been discriminated against. At all times, it is your right to address inquiries or concerns about possible discrimination to the Office for Equity and Diversity, Park Central Office Building, 117 Park Central Square, Suite 111, (417) 836-4252. Other types of concerns (i.e., concerns of an academic nature) should be discussed directly with your instructor and can also be brought to the attention of your instructor's Department Head. Please visit the OED website at www.missouristate.edu/equity/.

Statement on disability accommodation:

To request academic accommodations for a disability, contact the Director of the Disability Resource Center, Plaster Student Union, Suite 405, (417) 836-4192 or (417) 836-6792 (TTY), www.missouristate.edu/disability. Students are required to provide documentation of disability to the Disability Resource Center prior to receiving accommodations. The Disability Resource Center refers some types of accommodation requests to the Learning Diagnostic Clinic, which also provides diagnostic testing for learning and psychological disabilities. For information about testing, contact the Director of the Learning Diagnostic Clinic, (417) 836-4787. <http://psychology.missouristate.edu/ldc>.

Emergency Response Syllabi Statement

Students who require assistance during an emergency evacuation must discuss their needs with their professors and the Disability Resource Center. If you have emergency medical information to share with me, or if you need special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible. For additional information students should contact the Disability Resource Center, 836-4192 (PSU 405), or Larry Combs, Interim Assistant Director of Public Safety and Transportation at 836-6576. For further information on Missouri State University's Emergency Response Plan, please refer to the following web site: <http://www.missouristate.edu/safetran/erp.htm>

2

Missouri State University
CURRICULAR PROPOSAL
NEW COURSE (or new REGULAR SECTION of an existing variable content course)

Department Biology

Date 10/2/2012

Check one: New COURSE New REGULAR (i.e. permanent) SECTION of an existing variable content course. If a new regular section of an existing variable topics course, to what existing course is it to be attached? _____

PROPOSED CATALOG DESCRIPTION

BIO 501. Natural History Museum Techniques.

Techniques in the development of natural history museum displays including making models, design of displays, writing educational text, and other techniques. Course will be taught off-site at the Bull Shoals Field Station and Chase Studio. Taught concurrently with MST 501. Students cannot receive credit for both MST 501 and BIO 501. 2(1-2) D

PURPOSE OF COURSE

This course serves as an elective for the museum studies minor. It is an overview of natural history museums and mainly a techniques course for the design and preparation of natural history displays. Natural history museums fulfill educational and research goals. Displays provide educational material and entertainment. In many cases, they also serve as a repository for plant, animal and fossil specimens which are important to research. Students will learn a variety of preparation techniques for displays and educational signage.

RELATIONSHIP TO OTHER DEPARTMENTS

This is part of the museum studies minor and will be available to any student in this minor especially those interested in natural history museums. Students could be from a diverse group of departments, especially science. In addition, science majors may be interested in taking the course as an elective.

DEPARTMENT: Route according to ART VI, SEC 3B(1-4) of Bylaws of the Faculty. Attach New Course Resource Information form (FS 10a/05) and forward three typed, originally signed forms to one of the following (please check all that apply and send to first council/committee marked). If the course needs to go through more than one council/committee forward one additional form for each additional council/committee marked.

- College Council (All new course proposals numbered 100-599 must go through College Council first. After approval, College Council will forward appropriate number of copies to the next committee/ council or directly to the Faculty Senate if no further committee approval is needed.)
- Professional Education Committee (Considers all new courses affecting BS and MS in Education and Educational Specialist degrees)
- Committee on General Education and Intercollegiate Programs (Considers all general education and multi-college new course proposals)
- Graduate Council (Considers all 600-, 700-, and 800-level new courses)

If the course needs to go through more than one council/committee, forward one additional form for each additional council/committee marked.

Signature Alicia Mathis
Department Head

Date 11-7-12

2

NEW COURSE RESOURCE INFORMATION

Department Biology Date 10/2/2012

Course Number and Title BIO 501. Techniques in Natural History Museums

Anticipated Average Enrollment 10 Maximum Enrollment Limit 15

Faculty Load Assignment 4 Equated Hours

1 Is another course being deleted? If so, give course number and title.

No

2 What will this course require in the way of:

Additional library holdings? None

Additional computer resources? None

Additional or remodeled facilities? None

Additional equipment or supplies? Supplies for class activities will required

Additional travel funds? None

Additional faculty--general vs specialized? Terry Chase, Chase Studio, would teach the majority of this course as a per course instructor.

Other additional expenses?

3 If additional faculty are not required, how will faculty be made available to teach this course?

List names of current faculty qualified to teach this course: None

4 What is the anticipated source of students for this course? (If from within the department, will students be taking this course in addition to or in place of other courses? If from outside the department, which courses in other departments would most likely be affected?)

Museum Studies minor and, potentially, any science department especially Biology and Geography, Geology & Planning.

5 Other comments: This course will be taught at the Bull Shoals Field Station and Chase Studio.

MST 501: Natural History Museum Techniques

Purpose: This course will allow students to experience an introduction variety of techniques to design and develop natural history museum displays at Chase Studio, an internationally known designer/creator of natural history displays.

Location: This course will be taught at Chase Studio. Students may stay at the Bull Shoals Field Station during this course.

<u>Grading:</u>	Three project models	30%
	Educational text writing	20%
	Design project	40%
	One exam	10%

Course Outline:

1. Introduction to Chase Studio and the production of museum displays
2. Tour and use of reference library for scientific accuracy
3. Collections – management and care
4. Models – different styles/techniques of model-making
 - a. Sculpting media
 - b. Molding techniques
 - c. Casting techniques
 - d. Each student will make a model using each technique
5. Using computers as exhibition elements
6. Educational signage
 - a. Storyline and text development
 - b. Techniques in making signs
7. Design of displays
 - a. Design characteristics
 - b. Human factors in exhibition design
 - c. Methodologies and design strategies
 - d. Controlling the exhibition environment
8. Final project

Book Resources

Association of Nature Center Administrators. Director’s guide to best practices: Interpretive design of nature center exhibits.

Dean, D. 1994. Museum exhibition: Theory and practice.

Serrell, B. 1994. Making exhibit labels: A step by step guide.

Serrell, B. 1996. Exhibit labels: An interpretive approach.

Missouri State University
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Department Biology

Date 10/2/2012

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PROPOSED CATALOG DESCRIPTION

BIO 601. Natural History Museum Techniques.

Techniques in the development of natural history museum displays including making models, design of displays, writing educational text, and other techniques. Course will be taught off-site at the Bull Shoals Field Station and Chase Studio. Taught concurrently with MST 501. Students cannot receive credit for both MST 501 and BIO 501. 2(1-2) D

PURPOSE OF COURSE

This course serves as an elective for the museum studies minor. It is an overview of natural history museums and mainly a techniques course for the design and preparation of natural history displays. Natural history museums fulfill educational and research goals. Displays provide educational material and entertainment. In many cases, they also serve as a repository for plant, animal and fossil specimens which are important to research. Students will learn a variety of preparation techniques for displays and educational signage.

RELATIONSHIP TO OTHER DEPARTMENTS

This is part of the museum studies minor and will be available to any student in this minor especially those interested in natural history museums. Students could be from a diverse group of departments, especially science. In addition, science majors may be interested in taking the course as an elective.

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Signature Alicia Mathis
Department Head

Date 11-7-12

NEW COURSE RESOURCE INFORMATION

Department Museum Studies Date 10/2/2012

Course Number and Title MST 601. Natural History Museum Techniques

Anticipated Average Enrollment 10 Maximum Enrollment Limit 15

Faculty Load Assignment 4 Equated Hours

1 Is another course being deleted? If so, give course number and title.

No

2 What will this course require in the way of:

Additional library holdings? None

Additional computer resources? None

Additional or remodeled facilities? None

Additional equipment or supplies? Supplies for class activities will be required

Additional travel funds? None

Additional faculty--general vs specialized? Terry Chase, Chase Studio, would teach the majority of this course as a per course instructor.

Other additional expenses?

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List names of current faculty qualified to teach this course: None

4 What is the anticipated source of students for this course? (If from within the department, will students be taking this course in addition to or in place of other courses? If from outside the department, which courses in other departments would most likely be affected?)

Museum Studies minor and, potentially, any science department especially Biology and Geography, Geology & Planning.

5 Other comments: This course will be taught at the Bull Shoals Field Station and Chase Studio.

MST 601: Natural History Museum Techniques

Purpose: This course will allow students to experience an introduction variety of techniques to design and develop natural history museum displays at Chase Studio, an internationally known designer/creator of natural history displays.

Location: This course will be taught at Chase Studio. Students may stay at the Bull Shoals Field Station during this course.

<u>Grading:</u>	Three project models	30%
	Educational text writing	20%
	Design project	40%
	One exam	10%

Course Outline:

1. Introduction to Chase Studio and the production of museum displays
2. Tour and use of reference library for scientific accuracy
3. Collections – management and care
4. Models – different styles/techniques of model-making
 - a. Sculpting media
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8. Final project

Book Resources

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Serrell, B. 1994. Making exhibit labels: A step by step guide.

Serrell, B. 1996. Exhibit labels: An interpretive approach.

3

Missouri State University
CURRICULAR PROPOSAL

NEW COURSE (or new REGULAR SECTION of an existing variable content course)

Department Biology

Date April 26, 2012

Check one: New COURSE New REGULAR (i.e. permanent) SECTION of an existing variable content course. If a new regular section of an existing variable topics course, to what existing course is it to be attached? _____

PROPOSED CATALOG DESCRIPTION

BIO 545 Water Resources

Prerequisites: BIO 122 or GLG 110 or GRY 142; and CHM 160 and CHM 161; and MTH 135. An interdisciplinary study of freshwater resource development, including environmental impacts of humans on hydrology and water quality, conflicts among users, and politics at local and global scales. May be taught concurrently with BIO 645 and GLG 545 and GLG 645. Cannot receive credit for both BIO 545 and BIO 645 and GLG 545 and GLG 645. 3(3-0) S

PURPOSE OF COURSE

Broaden student understanding of vital environmental issues and support curricula in multiple departments (BIO, CHM, GGP). The interdisciplinary nature of the course helps to tie together concepts from multiple disciplines, apply basic scientific principles to applied problems, and exercise both written and quantitative skills.

Note: This course was originally developed and taught as GEP 397 (capstone) by John Havel (BIO), Melida Gutierrez (GGP), William Cheek (GGP), and Russell Rhodes (BIO). The course has also been taught several other times as BIO 597/697 (by John Havel) and is currently taught in a blended format.

RELATIONSHIP TO OTHER DEPARTMENTS

The course will serve students having environmental interests in CHM and GGP. The course would also make a good addition to the existing minor in environmental studies or proposed minor in sustainability.

DEPARTMENT: Route according to ART VI, SEC 3B(1-4) of Bylaws of the Faculty. Attach New Course Resource Information form (FS 300a/05) and forward three typed, originally signed forms to one of the following (please check all that apply and send to first council/committee marked). If the course needs to go through more than one council/committee forward one additional form for each additional council/committee marked.

- College Council (All new course proposals numbered 100-599 must go through College Council first. After approval, College Council will forward appropriate number of copies to the next committee/ council or directly to the Faculty Senate if no further committee approval is needed.)
- Professional Education Committee (Considers all new courses affecting BS and MS in Education and Educational Specialist degrees)
- Committee on General Education and Intercollegiate Programs (Considers all general education and multi-college new course proposals)
- Graduate Council (Considers all 600-, 700-, and 800-level new courses)

*If the course needs to go through more than one council/committee, forward one additional form for each additional council/committee marked.

Signature Alicia Mathis
Department Head

Date 12-10-12

(Routing on Reverse Side)

NEW COURSE RESOURCE INFORMATION

Department BiologyDate April 25, 2012Course Number and Title BIO 545 Water ResourcesAnticipated Average Enrollment 15Maximum Enrollment Limit 24Faculty Load Assignment 3 Equated Hours

1 Is another course being deleted? If so, give course number and title.

No

2 What will this course require in the way of:

Additional library holdings? none

Additional computer resources? none

Additional or remodeled facilities? none

Additional equipment or supplies? none

Additional travel funds? None (but see #3, below)

Additional faculty--general vs specialized? none

Other additional expenses? A student worker (2 hrs/wk) will be required for the first 2 times the course is taught; the Biology

Department Head has agreed to provide funds for this student worker.

3 If additional faculty are not required, how will faculty be made available to teach this course?

A Biology faculty member has taught the course in recent years as a variable topic course, BIO 597/697. As was the case when the course was taught as BIO 597/697, group transportation to field sites will be provided by the Biology Department.

List names of current faculty qualified to teach this course: John Havel

4 What is the anticipated source of students for this course? (If from within the department, will students be taking this course in addition to or in place of other courses? If from outside the department, which courses in other departments would most likely be affected?)

Primarily within the Department; the course will be added to the list of course options for the noncomprehensive major and the comprehensive major in Environmental Biology and Evolution. Students from other departments, including Geography, Geology and Planning, and the School of Agriculture may also find this course to be of interest.

5 Other comments:

COURSE PROPOSAL

Water Resources (BIO 545/645)

3 cr (3-0)

Course developed by:

John Havel, Department of Biology

The course was originally developed and taught as GEP 397 (capstone) with Melida Gutierrez (GGP), William Cheek (GGP), and Russell Rhodes (BIO). The course has also been taught several times as BIO 597/697.

A companion course proposal for Water Resources (GLG 545/645) is being submitted by Melida Gutierrez.

Course description

The purpose of the water resources course (BIO 570/670) is to provide an overview of water resources, from both scientific and public policy perspectives. Because of the vital uses and competing demands for fresh water, this course is of interest to students in the departments of Biology; Chemistry; Geography/Geology and Planning; and Environmental Engineering.

Information will be presented from an analytical and interdisciplinary perspective to provide students a broad understanding of the issues. BIO 570/670 will integrate knowledge from the natural sciences (biology, chemistry, geology, geography, hydrology) with that from other disciplines (economics, ethics, history, political science). Understanding the distribution and delivery of water resources depends on quantitative reasoning, so the course will include numerical problems. Since effective written communication is vital for educated employees and citizens, BIO 570/670 will also include frequent writing assignments as part of the course requirements.

Course objectives

During this course in water resources, students will develop a greater awareness of the many issues related to clean water as a sustainable resource, and develop the skills necessary to evaluate arguments of public policy. Critical thinking and effective communication will be emphasized. During this course, students will develop an understanding of a variety of topics, including the following:

1. Where water comes from and where it goes, both in natural systems (streams, lakes, groundwater) and in artificial systems (water treatment, sewage treatment).
2. Quantifying the volumes and flux of water, converting among the many (sometimes confusing) units of measure.
3. How global climate change can affect the distribution of water.
4. The competing demands for water, particularly in arid regions of the world.

5. What is groundwater, what rock formations form the best aquifers, and how to determine groundwater flow.
6. Groundwater mining as a temporary fix.
7. How streams work and why they are shaped as they are.
8. Using maps to define watersheds.
9. Why floods occur, how we control them, and why this control sometimes fails.
10. The many types of water pollution, their effects on people and the environment, and how their sources and effects can be reduced.
11. How wastewater and drinking water treatment systems operate for large cities, as well as at smaller scales (small communities and individual homes).
12. Quantifying the value of water.
13. The history of water resources development and the impact on where cities grow.
14. The different sorts of laws governing who is entitled to how much water.
15. Water resources conflicts and their impacts on regional and international politics.

Course structure

Students will read a standard text plus a variety of readings posted in Blackboard. With the guidance of study questions over the reading, they will take weekly online quizzes.

Class periods (for traditional or blended delivery) will include minimal lectures, lots of discussion and group projects, as well as time for lab and occasional field trips. For internet delivery, discussion will use Blackboard (discussion forum). On their own time, students will choose and attend a public policy meeting, such as a city council or regional water resources board.

The course will be writing intensive, with students writing responses and weekly assignments posted in Blackboard. Students will also give formal PowerPoint presentations.

Bibliography

Textbook

Cech, T.V. 2010. Principles of water resources: history, development, management, and policy. John Wiley and Sons, Inc. 3rd edition.

Other readings

Allan, J.D, and MM Castillo. 2007. Stream ecology: Structure and function of running waters. Springer.

Barry, John. 1997. Rising Tide : The Great Mississippi Flood of 1927 and how it changed America. Touchstone books. (ISBN 0-6848-40022)

Changnon, S.A. (ed.) 1996. The great flood of 1993: Causes, impacts, and responses. Westview Press.

Edmondson, W.T. 1991. The uses of ecology: Lake Washington and beyond. University of Washington Press.

Mason, C.F. 1992. Biology of freshwater pollution. Longman, 2nd edition.

Mackenzie, F.T., and J.A. Mackenzie. 1995. Our changing planet: an introduction to earth system science and global environmental change.

Postel, S. 1997. The last oasis: Facing water scarcity. W.W. Norton, Inc.

Some internet resources

- <http://www.state.mo.us/> (Missouri state government)
- <http://www.usgs.gov> (US Geological Survey)
- <http://water.usgs.gov> (USGS: Water resources of the United States)
- <http://wwwdmorll.er.usgs.gov/home.html> (USGS: Missouri water resources)
- http://wwwdmorll.er.usgs.gov/rt-cgi/gen_tbl_pg?page=2
(USGS: Missouri River flow data)
- <http://www.agu.org/wrr> (Water Resources Research)
- <http://www.nal.usda.gov/wqic/dbases.html> (Water Resources databases)
- <http://www.epa.gov/ow/> (US Environmental Protection Agency: water)

Academic support needed

Because a Biology faculty member has taught the course in recent years as BIO 597/697 (a variable topic course), approval of this course will not require additional faculty or reduced offering of another course. As was the case when the course was taught as BIO 597/697, group transportation to field sites will be provided by the Biology Department. No additional support is available.

Missouri State University
CURRICULAR PROPOSAL
NEW COURSE (or new REGULAR SECTION of an existing variable content course)

Department Geography, Geology and Planning

Date January 8, 2013

Check one: New COURSE New REGULAR (i.e. permanent) SECTION of an existing variable content course. If a new regular section of an existing variable topics course, to what existing course is it to be attached? _____

PROPOSED CATALOG DESCRIPTION

GLG 545 Water Resources

Prerequisites: BIO 122 or GLG 110 or GRY 142; and CHM 160 and CHM 161; and MTH 135. An interdisciplinary study of freshwater resource development, including environmental impacts of humans on hydrology and water quality, conflicts among users, and politics at local and global scales. May be taught concurrently with GLG 645, BIO 545 and BIO 645. Cannot receive credit for both GLG 545 and GLG 645 or BIO 545 or BIO 645. 3(3-0) S

PURPOSE OF COURSE

Broaden student understanding of vital environmental issues and support curricula in multiple departments (BIO, CHM, GGP). The interdisciplinary nature of the course helps to tie together concepts from multiple disciplines, apply basic scientific principles to applied problems, and exercise both written and quantitative skills.

Note: This course was originally developed and taught as GEP 397 (capstone) by John Havel (BIO), Melida Gutierrez (GGP), William Cheek (GGP), and Russell Rhodes (BIO). The course has also been taught several other times as BIO 597/697 (by John Havel) and is currently taught in a blended format.

RELATIONSHIP TO OTHER DEPARTMENTS

The course will serve students having environmental interests in CHM and GGP, and possibly environmental engineering students. The course would make a good addition to the existing minor in environmental studies or proposed minor in sustainability.

DEPARTMENT: Route according to ART VI, SEC 3B(1-4) of Bylaws of the Faculty. Attach New Course Resource Information form (FS 300a/05) and forward three typed, originally signed forms to one of the following (please check all that apply and send to first council/committee marked). If the course needs to go through more than one council/committee forward one additional form for each additional council/committee marked.

- College Council (All new course proposals numbered 100-599 must go through College Council first. After approval, College Council will forward appropriate number of copies to the next committee/ council or directly to the Faculty Senate if no further committee approval is needed.)
- Professional Education Committee (Considers all new courses affecting BS and MS in Education and Educational Specialist degrees)
- Committee on General Education and Intercollegiate Programs (Considers all general education and multi-college new course proposals)
- Graduate Council (Considers all 600-, 700-, and 800-level new courses)

*If the course needs to go through more than one council/committee, forward one additional form for each additional council/committee marked.

Signature Thomas O'Leary
Department Head

Date 1/9/2013

(Routing on Reverse Side)

NEW COURSE RESOURCE INFORMATIONDepartment Geography, Geology and PlanningDate January 8, 2013Course Number and Title GLG 545 Water ResourcesAnticipated Average Enrollment 25Maximum Enrollment Limit 33Faculty Load Assignment 3 Equated Hours

1. Is another course being deleted? No. If so, give course number and title.

2. What will this course require in the way of:

Additional library holdings? None

Additional computer resources? None

Additional or remodeled facilities? None

Additional equipment or supplies? None

Additional travel funds? None

Additional faculty--general vs specialized? None

Other additional expenses? None

3. If additional faculty are not required, how will faculty be made available to teach this course?

Gutierrez will offer this course every 3 years approximately. Previous course planning in the GGP department to allow her to teach this class

4. List names of current faculty qualified to teach this course: Melida Gutierrez (GGP) and John Havel (BIO)

5. What is the anticipated source of students for this course? (If from within the department, will students be taking this course in addition to or in place of other courses? If from outside the department, which courses in other departments would most likely be affected?)

This course will serve students having environmental interests in CHM, BIO and GGP. Faculty in those departments have provided input towards developing this course.

6. Other comments:

This course was originally developed and taught as GEP 397 (capstone) by John Havel (BIO), Melida Gutierrez (GGP), William Cheek (GGP), and Russell Rhodes (BIO). The course has also been taught several other times as BIO 597/697 (by John Havel) and is currently taught in a blended format.

COURSE PROPOSAL

Water Resources (GLG 545/645)

3 cr (3-0)

Course developed by:

John Havel (Biology) and Mélida Gutiérrez (Geography, Geology and Planning)

The course was originally developed and taught as GEP 397 (capstone) with Melida Gutierrez (GGP), William Cheek (GGP), and Russell Rhodes (BIO). The course has also been taught several times by John Havel as BIO 597/697. The cross listing BIO/GLG is to accommodate graduate students, and in lieu of the interdisciplinary nature of the course content.

Course description

The purpose of the water resources course (GLG 545/645, and cross listed as BIO 545/645) is to provide an overview of water resources, from both scientific and public policy perspectives. Because of the vital uses and competing demands for fresh water, this course is of interest to students in the departments of Biology; Chemistry; Geography/Geology and Planning; and Environmental Engineering.

Information will be presented from an analytical and interdisciplinary perspective to provide students a broad understanding of the issues. GLG 545/645 will integrate knowledge from the natural sciences (biology, chemistry, geology, geography, hydrology) with that from other disciplines (economics, ethics, history, political science). Understanding the distribution and delivery of water resources depends on quantitative reasoning, so the course will include numerical problems. Since effective written communication is vital for educated employees and citizens, GLG 545/645 will also include frequent writing assignments as part of the course requirements.

Course objectives

During this course in water resources, students will develop a greater awareness of the many issues related to clean water as a sustainable resource, and develop the skills necessary to evaluate arguments of public policy. Critical thinking and effective communication will be emphasized. During this course, students will develop an understanding of a variety of topics, including the following:

1. Where water comes from and where it goes, both in natural systems (streams, lakes, groundwater) and in artificial systems (water treatment, sewage treatment).
2. Quantifying the volumes and flux of water, converting among the many (sometimes confusing) units of measure.
3. How global climate change can affect the distribution of water.
4. The competing demands for water, particularly in arid regions of the world.

Changnon, S.A. (ed.) 1996. The great flood of 1993: Causes, impacts, and responses. Westview Press.

Mackenzie, F.T., and J.A. Mackenzie. 1995. Our changing planet: an introduction to earth system science and global environmental change.

Postel, S. 1997. The last oasis: Facing water scarcity. W.W. Norton, Inc.

Reisner, M. 1993. Cadillac Desert, the American West and its disappearing water, Penwin Books USA Inc.

Some internet resources

- <http://www.state.mo.us/> (Missouri state government)
- <http://www.usgs.gov> (US Geological Survey)
- <http://water.usgs.gov> (USGS: Water resources of the United States)
- <http://wwwdmorll.er.usgs.gov/home.html> (USGS: Missouri water resources)
- http://wwwdmorll.er.usgs.gov/rt-cgi/gen_tbl_pg?page=2
(USGS: Missouri River flow data)
- <http://www.agu.org/wrr> (Water Resources Research)
- <http://www.nal.usda.gov/wqic/dbases.html> (Water Resources databases)
- <http://www.epa.gov/ow/> (US Environmental Protection Agency: water)

Academic support needed

Approval of this course will not require additional faculty or reduced offering of another course. When needed, group transportation to field sites will be provided by the GGP Department. No additional support is available.

Missouri State University
CURRICULAR PROPOSAL
NEW COURSE (or new REGULAR SECTION of an existing variable content course)

Department Biology

Date April 26, 2012

Check one: New COURSE New REGULAR (i.e. permanent) SECTION of an existing variable content course. If a new regular section of an existing variable topics course, to what existing course is it to be attached? _____

PROPOSED CATALOG DESCRIPTION

BIO 645 Water Resources

Recommended Prerequisites: BIO 122 or GLG 110 or GRY 142; and CHM 160 and CHM 161; and MTH 135. An interdisciplinary study of freshwater resource development, including environmental impacts of humans on hydrology and water quality, conflicts among users, and politics at local and global scales. May be taught concurrently with BIO 545 and GLG 545 and GLG 645. Cannot receive credit for both BIO 545 and BIO 645 and GLG 545 and GLG 645. 3(3-0) S

PURPOSE OF COURSE

Broaden student understanding of vital environmental issues. The interdisciplinary nature of the course helps to tie together concepts from multiple disciplines, apply basic scientific principles to applied problems, and exercise both written and quantitative skills. The course should support curricula for Master's Degree programs in multiple departments (BIO, CHM, GGP) and other programs, such as Master of Natural and Applied Science. The course should also serve in-service teachers and other professionals in the community. To reach a broader geographic range, the course can be taught in the blended format.

Note: This course was originally developed and taught as GEP 397 (capstone) by John Havel (BIO), Melida Gutierrez (GGP), William Cheek (GGP), and Russell Rhodes (BIO). The course has also been taught several other times as BIO 597/697 (by John Havel) and is currently taught in a blended format.

RELATIONSHIP TO OTHER DEPARTMENTS

The course will serve graduate students having environmental interests in CHM and GGP. Faculty in those departments have provided input toward development of this course.

DEPARTMENT: Route according to ART VI, SEC 3B(1-4) of Bylaws of the Faculty. Attach New Course Resource Information form (FS 300a/05) and forward three typed, originally signed forms to one of the following (please check all that apply and send to first council/committee marked). If the course needs to go through more than one council/committee forward one additional form for each additional council/committee marked.

- College Council (All new course proposals numbered 100-599 must go through College Council first. After approval, College Council will forward appropriate number of copies to the next committee/ council or directly to the Faculty Senate if no further committee approval is needed.)
- Professional Education Committee (Considers all new courses affecting BS and MS in Education and Educational Specialist degrees)
- Committee on General Education and Intercollegiate Programs (Considers all general education and multi-college new course proposals)
- Graduate Council (Considers all 600-, 700-, and 800-level new courses)

*If the course needs to go through more than one council/committee, forward one additional form for each additional council/committee marked.

Signature Alicia Mather
Department Head

Date 12-10-12

NEW COURSE RESOURCE INFORMATION

Department Biology

Date April 25, 2012

Course Number and Title BIO 645 Water Resources

Anticipated Average Enrollment 15

Maximum Enrollment Limit 24

Faculty Load Assignment 3 Equated Hours

1 Is another course being deleted? If so, give course number and title.

No

2 What will this course require in the way of:

Additional library holdings? none

Additional computer resources? none

Additional or remodeled facilities? none

Additional equipment or supplies? none

Additional travel funds? None (but see #3, below)

Additional faculty--general vs specialized? none

Other additional expenses? A student worker (2 hrs/wk) will be required for the first 2 times the course is taught; the Biology

Department Head has agreed to provide funds for this student worker.

3 If additional faculty are not required, how will faculty be made available to teach this course?

A Biology faculty member has taught the course in recent years as a variable topic course, BIO 597/697. As was the case when the course was taught as BIO 597/697, group transportation to field sites will be provided by the Biology Department.

List names of current faculty qualified to teach this course: John Havel

4 What is the anticipated source of students for this course? (If from within the department, will students be taking this course in addition to or in place of other courses? If from outside the department, which courses in other departments would most likely be affected?)

The course will be added to the list of course options for graduate students in the MS/Biology, MSED/Biology and MNAS/Biology programs. It also might be of interest to graduate students in other departments, including Chemistry; Geology, Geography and Planning, and the School of Agriculture.

5 Other comments:

COURSE PROPOSAL

Water Resources (BIO 545/645)

3 cr (3-0)

Course developed by:

John Havel, Department of Biology

The course was originally developed and taught as GEP 397 (capstone) with Melida Gutierrez (GGP), William Cheek (GGP), and Russell Rhodes (BIO). The course has also been taught several times as BIO 597/697.

A companion course proposal for Water Resources (GLG 545/645) is being submitted by Melida Gutierrez.

Course description

The purpose of the water resources course (BIO 570/670) is to provide an overview of water resources, from both scientific and public policy perspectives. Because of the vital uses and competing demands for fresh water, this course is of interest to students in the departments of Biology; Chemistry; Geography/Geology and Planning; and Environmental Engineering.

Information will be presented from an analytical and interdisciplinary perspective to provide students a broad understanding of the issues. BIO 570/670 will integrate knowledge from the natural sciences (biology, chemistry, geology, geography, hydrology) with that from other disciplines (economics, ethics, history, political science). Understanding the distribution and delivery of water resources depends on quantitative reasoning, so the course will include numerical problems. Since effective written communication is vital for educated employees and citizens, BIO 570/670 will also include frequent writing assignments as part of the course requirements.

Course objectives

During this course in water resources, students will develop a greater awareness of the many issues related to clean water as a sustainable resource, and develop the skills necessary to evaluate arguments of public policy. Critical thinking and effective communication will be emphasized. During this course, students will develop an understanding of a variety of topics, including the following:

1. Where water comes from and where it goes, both in natural systems (streams, lakes, groundwater) and in artificial systems (water treatment, sewage treatment).
2. Quantifying the volumes and flux of water, converting among the many (sometimes confusing) units of measure.
3. How global climate change can affect the distribution of water.
4. The competing demands for water, particularly in arid regions of the world.

5. What is groundwater, what rock formations form the best aquifers, and how to determine groundwater flow.
6. Groundwater mining as a temporary fix.
7. How streams work and why they are shaped as they are.
8. Using maps to define watersheds.
9. Why floods occur, how we control them, and why this control sometimes fails.
10. The many types of water pollution, their effects on people and the environment, and how their sources and effects can be reduced.
11. How wastewater and drinking water treatment systems operate for large cities, as well as at smaller scales (small communities and individual homes).
12. Quantifying the value of water.
13. The history of water resources development and the impact on where cities grow.
14. The different sorts of laws governing who is entitled to how much water.
15. Water resources conflicts and their impacts on regional and international politics.

Course structure

Students will read a standard text plus a variety of readings posted in Blackboard. With the guidance of study questions over the reading, they will take weekly online quizzes.

Class periods (for traditional or blended delivery) will include minimal lectures, lots of discussion and group projects, as well as time for lab and occasional field trips. For internet delivery, discussion will use Blackboard (discussion forum). On their own time, students will choose and attend a public policy meeting, such as a city council or regional water resources board.

The course will be writing intensive, with students writing responses and weekly assignments posted in Blackboard. Students will also give formal PowerPoint presentations.

Bibliography

Textbook

Cech, T.V. 2010. Principles of water resources: history, development, management, and policy. John Wiley and Sons, Inc. 3rd edition.

Other readings

Allan, J.D, and MM Castillo. 2007. Stream ecology: Structure and function of running waters. Springer.

Barry, John. 1997. Rising Tide : The Great Mississippi Flood of 1927 and how it changed America. Touchstone books. (ISBN 0-6848-40022)

Changnon, S.A. (ed.) 1996. The great flood of 1993: Causes, impacts, and responses. Westview Press.

Edmondson, W.T. 1991. The uses of ecology: Lake Washington and beyond. University of Washington Press.

Mason, C.F. 1992. Biology of freshwater pollution. Longman, 2nd edition.

Mackenzie, F.T., and J.A. Mackenzie. 1995. Our changing planet: an introduction to earth system science and global environmental change.

Postel, S. 1997. The last oasis: Facing water scarcity. W.W. Norton, Inc.

Some internet resources

- <http://www.state.mo.us/> (Missouri state government)
- <http://www.usgs.gov> (US Geological Survey)
- <http://water.usgs.gov> (USGS: Water resources of the United States)
- <http://wwwdmorll.er.usgs.gov/home.html> (USGS: Missouri water resources)
- http://wwwdmorll.er.usgs.gov/rt-cgi/gen_tbl_pg?page=2
(USGS: Missouri River flow data)
- <http://www.agu.org/wrr> (Water Resources Research)
- <http://www.nal.usda.gov/wqic/dbases.html> (Water Resources databases)
- <http://www.epa.gov/ow/> (US Environmental Protection Agency: water)

Academic support needed

Because a Biology faculty member has taught the course in recent years as BIO 597/697 (a variable topic course), approval of this course will not require additional faculty or reduced offering of another course. As was the case when the course was taught as BIO 597/697, group transportation to field sites will be provided by the Biology Department. No additional support is available.

3

Missouri State University
CURRICULAR PROPOSAL
NEW COURSE (or new REGULAR SECTION of an existing variable content course)

Department Geography, Geology, and Planning

Date January 8, 2012

Check one: New COURSE New REGULAR (i.e. permanent) SECTION of an existing variable content course. If a new regular section of an existing variable topics course, to what existing course is it to be attached? _____

PROPOSED CATALOG DESCRIPTION

GLG 645 Water Resources

Recommended Prerequisites: BIO 122 or GLG 110 or GRY 142; and CHM 160 and CHM 161; and MTH 135. An interdisciplinary study of freshwater resource development, including environmental impacts of humans on hydrology and water quality, conflicts among users, and politics at local and global scales. May be taught concurrently with GLG 645, BIO 645 and BIO 545. Cannot receive credit for both GLG 645 and GLG 545 or BIO 570 or BIO 670. 3(3-0) S

PURPOSE OF COURSE

Broaden student understanding of vital environmental issues. The interdisciplinary nature of the course helps to tie together concepts from multiple disciplines, apply basic scientific principles to applied problems, and exercise both written and quantitative skills. The course should support curricula for Master's Degree programs in multiple departments (BIO, CHM, GGP) and other programs, such as Master of Natural and Applied Science. The course should also serve in-service teachers and other professionals in the community. To reach a broader geographic range, the course can be taught in the blended format.

Note: This course was originally developed and taught as GEP 397 (capstone) by John Havel (BIO), Melida Gutierrez (GGP), William Cheek (GGP), and Russell Rhodes (BIO). The course has also been taught several other times as BIO 597/697 (by John Havel) and is currently taught in a blended format.

RELATIONSHIP TO OTHER DEPARTMENTS

The course will serve graduate students having environmental interests in CHM and GGP. Faculty in those departments have provided input toward development of this course.

DEPARTMENT: Route according to ART VI, SEC 3B(1-4) of Bylaws of the Faculty. Attach New Course Resource Information form (FS 300a/05) and forward three typed, originally signed forms to one of the following (please check all that apply and send to first council/committee marked). If the course needs to go through more than one council/committee forward one additional form for each additional council/committee marked.

- XXX College Council (All new course proposals numbered 100-599 must go through College Council first. After approval, College Council will forward appropriate number of copies to the next committee/ council or directly to the Faculty Senate if no further committee approval is needed.)
- Professional Education Committee (Considers all new courses affecting BS and MS in Education and Educational Specialist degrees)
- Committee on General Education and Intercollegiate Programs (Considers all general education and multi-college new course proposals)
- XXX Graduate Council (Considers all 600-, 700-, and 800-level new courses)

*If the course needs to go through more than one council/committee, forward one additional form for each additional council/committee marked.

Signature *Thomas L. Olyzik*
Department Head

Date 1/9/2013

(Routing on Reverse Side)

3

NEW COURSE RESOURCE INFORMATION

Department Geography, Geology and Planning

Date January 8, 2013

Course Number and Title GLG 645 Water Resources

Anticipated Average Enrollment 25

Maximum Enrollment Limit 33

Faculty Load Assignment 3 Equated Hours

1 Is another course being deleted? No. If so, give course number and title.

2 What will this course require in the way of:

Additional library holdings? None

Additional computer resources? None

Additional or remodeled facilities? None

Additional equipment or supplies? None

Additional travel funds? None

Additional faculty--general vs specialized? None

Other additional expenses? None

3 If additional faculty are not required, how will faculty be made available to teach this course?

Gutierrez will offer this course every 3 years approximately. Previous course planning in the GGP department to allow her to teach this class.

List names of current faculty qualified to teach this course: Melida Gutierrez (GGP) and John Havel (BIO).

4 What is the anticipated source of students for this course? (If from within the department, will students be taking this course in addition to or in place of other courses? If from outside the department, which courses in other departments would most likely be affected?)

This course will serve graduate students having environmental interests in CHM, BIO and GGP. Faculty in those departments have provided input towards developing this course.

5 Other comments:

This course was originally developed and taught as GEP 397 (capstone) by John Havel (BIO), Melida Gutierrez (GGP), William Cheek (GGP), and Russell Rhodes (BIO). The course has also been taught several other times as BIO 597/697 (by John Havel) and is currently taught in a blended format.

COURSE PROPOSAL

Water Resources (GLG 545/645)

3 cr (3-0)

Course developed by:

John Havel (Biology) and Mélida Gutiérrez (Geography, Geology and Planning)

The course was originally developed and taught as GEP 397 (capstone) with Melida Gutierrez (GGP), William Cheek (GGP), and Russell Rhodes (BIO). The course has also been taught several times by John Havel as BIO 597/697. The cross listing BIO/GLG is to accommodate graduate students, and in lieu of the interdisciplinary nature of the course content.

Course description

The purpose of the water resources course (GLG 545/645, and cross listed as BIO 545/645) is to provide an overview of water resources, from both scientific and public policy perspectives. Because of the vital uses and competing demands for fresh water, this course is of interest to students in the departments of Biology; Chemistry; Geography/Geology and Planning; and Environmental Engineering.

Information will be presented from an analytical and interdisciplinary perspective to provide students a broad understanding of the issues. GLG 545/645 will integrate knowledge from the natural sciences (biology, chemistry, geology, geography, hydrology) with that from other disciplines (economics, ethics, history, political science). Understanding the distribution and delivery of water resources depends on quantitative reasoning, so the course will include numerical problems. Since effective written communication is vital for educated employees and citizens, GLG 545/645 will also include frequent writing assignments as part of the course requirements.

Course objectives

During this course in water resources, students will develop a greater awareness of the many issues related to clean water as a sustainable resource, and develop the skills necessary to evaluate arguments of public policy. Critical thinking and effective communication will be emphasized. During this course, students will develop an understanding of a variety of topics, including the following:

1. Where water comes from and where it goes, both in natural systems (streams, lakes, groundwater) and in artificial systems (water treatment, sewage treatment).
2. Quantifying the volumes and flux of water, converting among the many (sometimes confusing) units of measure.
3. How global climate change can affect the distribution of water.
4. The competing demands for water, particularly in arid regions of the world.

5. What is groundwater, what rock formations form the best aquifers, and how to determine groundwater flow.
6. Groundwater mining as a temporary fix.
7. How streams work and why they are shaped as they are.
8. Using maps to define watersheds.
9. Why floods occur, how we control them, and why this control sometimes fails.
10. The many types of water pollution, their effects on people and the environment, and how their sources and effects can be reduced.
11. How wastewater and drinking water treatment systems operate for large cities, as well as at smaller scales (small communities and individual homes).
12. Quantifying the value of water.
13. The history of water resources development and the impact on where cities grow.
14. The different sorts of laws governing who is entitled to how much water.
15. Water resources conflicts and their impacts on regional and international politics.

Course structure

Students will read a standard text plus a variety of readings posted in Blackboard. With the guidance of study questions over the reading, they will take weekly online quizzes.

Class periods (for traditional or blended delivery) will include minimal lectures, lots of discussion and group projects, as well as time for lab and occasional field trips. For internet delivery, discussion will use Blackboard (discussion forum). On their own time, students will choose and attend a public policy meeting, such as a city council or regional water resources board.

The course will be writing intensive, with students writing responses and weekly assignments posted in Blackboard. Students will also give formal PowerPoint presentations.

Bibliography

Textbook

Cech, T.V. 2010. Principles of water resources: history, development, management, and policy. John Wiley and Sons, Inc. 3rd edition.

Other readings

Allan, J.D, and MM Castillo. 2007. Stream ecology: Structure and function of running waters. Springer.

Barry, John. 1997. Rising Tide : The Great Mississippi Flood of 1927 and how it changed America. Touchstone books. (ISBN 0-6848-40022)

Changnon, S.A. (ed.) 1996. The great flood of 1993: Causes, impacts, and responses. Westview Press.

Mackenzie, F.T., and J.A. Mackenzie. 1995. Our changing planet: an introduction to earth system science and global environmental change.

Postel, S. 1997. The last oasis: Facing water scarcity. W.W. Norton, Inc.

Reisner, M. 1993. Cadillac Desert, the American West and its disappearing water, Penwin Books USA Inc.

Some internet resources

- <http://www.state.mo.us/> (Missouri state government)
- <http://www.usgs.gov> (US Geological Survey)
- <http://water.usgs.gov> (USGS: Water resources of the United States)
- <http://wwwdmorll.er.usgs.gov/home.html> (USGS: Missouri water resources)
- http://wwwdmorll.er.usgs.gov/rt-cgi/gen_tbl_pg?page=2
(USGS: Missouri River flow data)
- <http://www.agu.org/wrr> (Water Resources Research)
- <http://www.nal.usda.gov/wqic/dbases.html> (Water Resources databases)
- <http://www.epa.gov/ow/> (US Environmental Protection Agency: water)

Academic support needed

Approval of this course will not require additional faculty or reduced offering of another course. When needed, group transportation to field sites will be provided by the GGP Department. No additional support is available.

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**Missouri State University
Curricular Proposal Course Change or Deletion**

Department Biology

Date January 7, 2013

Check one: This is a change to an existing COURSE
 an existing REGULAR (i.e. permanent) SECTION of a variable content course

Present Catalog Description (Cut and paste from web catalog or use most recent description.)	Revised Catalog Description (Cut and paste description again, strikethrough all deletions, and insert and bold new information.)
<p>BIO 101 Biological Concepts</p> <p>Prerequisite: permission. Lecture portion only of BIO 102. This course allows students who have prior transfer credit for the laboratory portion of BIO 102 to take the lecture portion of BIO 102 as a stand-alone three credit hour course. Does not count for general education credit for students whom enter under the fall 1997 catalog or later, unless prior approval is granted. Does not count for credit towards a major or minor in biology. Students receive credit towards graduation for only one of BIO 100, 101, or 102. 3(3-0) F,S</p>	<p>BIO 101 Biological Concepts Biology in Your World</p> <p>Prerequisite: permission. Lecture portion only of BIO 102. This course allows students who have prior transfer credit for the laboratory portion of BIO 102 to take the lecture portion of BIO 102 as a stand-alone three credit hour course. Does not count for general education credit for students whom enter under the fall 1997 catalog or later, unless prior approval is granted. Does not count for credit towards a major or minor in biology. General Education Course (Natural World). A non-laboratory course that can fulfill the general education requirement in the Life Sciences. Organisms are studied from their behavioral, ecological, hereditary and evolutionary perspectives. Topics include examination of the human body in health and disease; the relevance of biology to contemporary issues in human society; an introduction to environmental science and ecology with emphasis on the interrelationships of living and nonliving things in ecosystems and how disruptions of these relationships result in environmental problems. Students receive credit towards graduation for only one of BIO 100 or 101, or 102. May not be counted for credit toward a biology degree. 3(3-0) F,S,S<u>u</u></p>

What is changing? Check all boxes that apply.

- Course Deletion Course Code Course Number Title Prerequisite
 Credit Hours/Contact Hours X Periodicity X Description

Reason for Proposed Change or Deletion

A 3 credit hour Biology lecture course is needed for general education. BIO 101 is an existing course that will now meet the general education requirement. BIO 102 will be deleted in a separate proposal.

How Did You Determine the Need For This Change or Deletion?

The revision of the general education program at MSU requires that biological science be available in a 3 hour course.

COMPLETE NEW CATALOG INFORMATION (typed)

General Education Course (Natural World). A non-laboratory course that can fulfill the general education requirement in the Life Sciences. Organisms are studied from their behavioral, ecological, hereditary and evolutionary perspectives. Topics include examination of the human body in health and disease; the relevance of biology to contemporary issues in human society; an introduction to environmental science and ecology with emphasis on the interrelationships of living and nonliving things in ecosystems and how disruptions of these relationships result in environmental problems. Students receive credit towards graduation for only one of BIO 100 or 101. May not be counted for credit toward a biology degree. 3(3-0) F,S,Su

Check if this is a non-substantive change. Distribution for non-substantive changes of 100- through 500-level courses: two originally-signed copies to Faculty Senate; 600- through 900-level courses: three originally-signed copies to Graduate Council. Graduate Council will give two copies to Faculty Senate after approval.

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Substantive Change: Department routes according to ART VI, SEC 3B(1-4) of Bylaws of the Faculty. Forward three originally signed forms to one of the following (please check all that apply and send to first council/committee marked). If proposal needs to go through more than one council/committee, forward one additional form for each additional council/committee marked. See Senate Action 11-93/94 for definitions of substantive/non-substantive changes.

College Council

(All substantive course changes numbered 100-599 must go through College Council first. After approval, College Council will forward appropriate number of copies to the next committee/council or directly to the Faculty Senate if no further committee approval is needed. The last level of committee/council will forward two originally signed copies to the Faculty Senate.)

Professional Education Committee

(Considers all substantive course changes for Professional Education courses and Teaching Methods courses.)

Committee on General Education and Intercollegiate Programs

(Considers all substantive course changes for General Education and Intercollegiate Program proposals.)

Graduate Council

(Considers all 600-900 level course changes.)

Signature Alicia Mathew
Department Head

Date 1-8-13

(Routing on Reverse Side)

FS Course Change - 9/10/2010

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Missouri State University
CURRICULAR PROPOSAL
NEW COURSE (or new REGULAR SECTION of an existing variable content course)

Department CHM

Date ~~11/29/12~~ 11/29/12

Check one: New COURSE New REGULAR (i.e. permanent) SECTION of an existing variable content course. If a new regular section of an existing variable topics course, to what existing course is it to be attached? _____

PROPOSED CATALOG DESCRIPTION

CHM 202 Essentials of Organic Chemistry Laboratory

Prerequisite: "C-" grade or better in CHM117 or CHM 161; "C-" grade or better in CHM200 or concurrent enrollment. Principles of organic chemistry and biochemistry. Does not apply toward a chemistry major or minor if the student passes CHM 342. Emphasis on experiments and lab skills associated with the lecture material in CHM201. May not be taken Pass/Not Pass. Supplemental course fee. 2(0-3) F,S

PURPOSE OF COURSE

The courses CHM200 (lecture and lab) and 201 (lecture only) are being altered to have a single course which is lecture only (CHM201) and a single course that is the associated lab (CHM202). This will alleviate problems with student registration and advising associated with transfer credits from institutions where these courses were separate. The numbering is now consistent with the rest of the course numberings in the department.

There have been a large numbering of transfer credit problems associated with these courses. This will also allow for separation of grades in the performance of these courses. The Registrar's office suggested structuring these proposed changes in this fashion to alleviate as many registration problems as possible.

RELATIONSHIP TO OTHER DEPARTMENTS

DEPARTMENT: Route according to ART VI, SEC 3B(1-4) of Bylaws of the Faculty. Attach New Course Resource Information form (FS 300a/05) and forward three typed, originally signed forms to one of the following (please check all that apply and send to first council/committee marked). If the course needs to go through more than one council/committee forward one additional form for each additional council/committee marked.

- College Council (All new course proposals numbered 100-599 must go through College Council first. After approval, College Council will forward appropriate number of copies to the next committee/ council or directly to the Faculty Senate if no further committee approval is needed.)
- Professional Education Committee (Considers all new courses affecting BS and MS in Education and Educational Specialist degrees)
- Committee on General Education and Intercollegiate Programs (Considers all general education and multi-college new course proposals)
- Graduate Council (Considers all 600-, 700-, and 800-level new courses)

*If the course needs to go through more than one council/committee, forward one additional form for each additional council/committee marked.

Signature [Signature]
Department Head

Date 11/29/12

(Routing on Reverse Side)

FS New Course - 9/10/2010

Chemistry 202 – Lab Syllabus – Fall 201XX

Lab Section: Lab Instructor

Office: Office Hours:

Phone number: Email:

Required Items:

1. **Laboratory Manual:** Chemistry 202 Lab Manual; the laboratory manual is a spiral-bound collection of experiments from Chemical Education Resources (CER).
2. **A scientific calculator** – bring this with you to each scheduled laboratory and exam.
 - Be sure you know how to use your calculator, especially how to enter scientific notation and how to control display formats.*
 - You may not use any electronic device capable of displaying extensive text or programmed calculations. Cell phones and similar communication devices may not be used for any examinations or quizzes (note that this does not include calculators normally used in math classes, such as HP 80 and 90 series).*
3. A pair of ANSI Z-89 approved **safety goggles** and a **pair of shoes that cover the entire foot (closed-toed and closed-heeled)** – bring these with you to each scheduled laboratory. **YOU WILL NOT BE ALLOWED TO WORK IN THE LAB WITHOUT APPROVED GOGGLES OR APPROVED SHOES!!!!!!**
4. You will be required to participate in the Blackboard website for this course.

Goals of the CHM 202 Lab:

Students completing the laboratory portion of CHM 202 will:

1. Learn to work safely in a laboratory environment, including the proper technique and safe handling of chemicals and laboratory equipment.
2. Have the basic analytical and technical skills to work effectively in a laboratory environment.
3. Learn to work as an effective team member with other students in the laboratory.
4. Develop the ability to perform accurate quantitative and qualitative measurements as they relate to Organic Chemistry
5. Have the ability to use information technology tools such as the internet and Blackboard as well as printed literature resources to locate and retrieves scientific information needed for laboratory work.
6. Have the ability to present scientific and technical information resulting from laboratory experimentation in both written and oral formats.
7. Learn appropriate use of key measurement techniques used in a chemistry laboratory.
8. Interpret and generate visual information.

Attendance:

ATTENDANCE AT LAB IS REQUIRED. There will be **NO MAKE UP** on labs. You will be allowed to drop your lowest lab score, so this may be used for an absence as explained in the laboratory grading policy below. You will receive a score of zero for all labs that you do not attend.

Laboratory Grading/Reports:

- There will be a 10 point quiz for each experiment, given on the Blackboard website, which must be completed before lab each week. The quiz will be based on the Prelab Lecture and Prelab Questions for the lab. You will be allowed to drop your lowest quiz score. If you miss a quiz, it will be graded as a zero and used as your lowest quiz score, which subsequently will be dropped. If you miss more than one quiz, each additional absence will count as a zero.
- Each lab report will be graded on a 25-point basis. Lab reports will consist of pre-lab questions, raw data and data analysis, and post-lab questions, and will be completed and turned in before the end of lab each week. Twelve experiments will be conducted. The best 11 report grades will be counted toward your lab score. You will be allowed to drop your lowest report score. If you miss an experiment, the report will

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be graded as a zero and used as your lowest report score, which subsequently will be dropped. If you miss more than one report, each additional absence will count as a zero.

Two 100-point laboratory practical exams will be given during the semester.

35 points prelab lecture attendance

110 points 12 quizzes, 10 pts each, top 11 counted

275 points 12 Lab reports, 25 pts each, top 11 counted

100 points Midterm Laboratory Exam

100 points Final Laboratory Exam

620 points TOTAL POSSIBLE

Your total grade for lab will be reported to your CHM 200 lecture instructor as a percentage of total points earned. The percentage of your total CHM 200 grade to be determined by the lab is at the discretion of your lecture instructor; check with him or her for further information regarding this policy. It is recommended that you keep all of your lab reports until the end of the semester to study for the exams and as proof of your grade.

Lab drawers and working areas:

There will be "common" lab drawer, cupboard and work areas for each pair of students in the lab. These drawers are "common" to all lab sections, i.e. students in each of the four lab sections will share the same areas and materials. Therefore, it is important that you and your partner keep these areas neat and fully stocked so that persons working in the lab after you have everything available. Always clean your work area upon completion of each laboratory. **Failure to do so will result in a loss of points for that lab.**

Punctuality:

The first several minutes of the laboratory are generally devoted to reviewing the procedure(s) to be performed and the safety information. If you miss this review, you may not be allowed to perform the laboratory for safety reasons and you will receive a zero for that lab. **Plan to be on time for all lab periods.**

Preparation:

It is your responsibility to read the correct laboratory experiments and complete the prelab assignments before the beginning of the laboratory. **NOTE THAT THE LABS MAY NOT BE DONE IN THE ORDER GIVEN IN THE BOOK.** Absence at the prior laboratory is not an excuse for not knowing the assignment. Refer to the laboratory schedule to determine which lab will be performed for a given date. At the discretion of your laboratory instructor, you may be denied the opportunity to perform the laboratory experiments if you fail to demonstrate an understanding of the lab being performed that day.

Safety:

Federal and state law requires that safety goggles be worn in all chemistry laboratories. You must purchase and wear a pair of safety goggles that meet the ANSI Z87.1989 Standard and State of Missouri Standards **at all times you are in the laboratory.** Visorgogs are acceptable and are available at the Missouri State Bookstore. In general, you will not remove your safety goggles until you leave the laboratory. A first offense of not wearing safety goggles will receive a warning from the laboratory instructor. A second offense will result in your being asked to leave the laboratory and will result in a zero score for that experiment.

Be sure to know where all safety equipment (eye wash stations, fire extinguisher, safety shower) is located. Also, know where exits are located in case of an emergency. Materials Safety Data Sheets (MSDS) are available in the chemical stock room (Temple Hall 403) for any student wishing to obtain further information concerning the chemicals being used in each experiment. Alternately, MSDS may be looked up online.

University Policies:

NONDISCRIMINATION : Missouri State University is an equal opportunity/affirmative action institution, and maintains a grievance procedure available to any person who believes he or she has been discriminated against. At all times, it is your right to address inquiries or concerns about possible discrimination to the Office for Equity and Diversity, Park Central Office Building, 117 Park Central Square, Suite 111, (417) 836-4252. Other types of concerns (i.e., concerns of an academic nature) should be discussed directly with your instructor and can also be brought to the attention of your instructor's Department Head. Please visit the OED website at www.missouristate.edu/equity/.

DISABILITY ACCOMMODATION: To request academic accommodations for a disability, contact the Director of the Disability Resource Center, Plaster Student Union, Suite 405, (417) 836-4192 or (417) 836-6792 (TTY), www.missouristate.edu/disability. Students are required to provide documentation of disability to the Disability Resource Center prior to receiving accommodations. The Disability Resource Center refers some types of accommodation requests to the Learning Diagnostic Clinic, which also provides diagnostic testing for learning and psychological disabilities. For information about testing, contact the Director of the Learning Diagnostic Clinic, (417) 836-4787, <http://psychology.missouristate.edu/lcd>.

ACADEMIC INTEGRITY: Missouri State University is a community of scholars committed to developing educated persons who accept the responsibility to practice personal and academic integrity. You are responsible for knowing and following the university's *Student Academic Integrity Policies and Procedures*, available at www.missouristate.edu/policy/academicintegritystudents.htm. You are also responsible for understanding and following any additional academic integrity policies specific to this class (as outlined by the instructor). Any student participating in any form of academic dishonesty will be subject to sanctions as described in this policy. If you are accused of violating this policy and are in the appeals process, you should continue participating in the class.

CLASS DROPS: It is your responsibility to understand the University's procedure for dropping a class. If you stop attending this class but do not follow proper procedure for dropping the class, you will receive a failing grade and will also be financially obligated to pay for the class. For information about dropping a class or withdrawing from the university, contact the Office of the Registrar at 836-5520.

EMERGENCY RESPONSE STATEMENT: Students who require assistance during an emergency evacuation must discuss their needs with their professors and Disability Services. If you have emergency medical information to share with me, or if you need special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible. For additional information students should contact the Disability Resource Center, 836-4192 (PSU 405), or Larry Combs, Interim Assistant Director of Public Safety and Transportation at 836-6576. For further information on Missouri State University's Emergency Response Plan, please refer to the following web site: <http://www.missouristate.edu/safetran/erp.htm>

OFFICIAL CELL PHONE POLICY: As a member of the learning community, each student has a responsibility to other students who are members of the community. When cell phones or pagers ring and students respond in class or leave class to respond, it disrupts the class. Therefore, the Office of the Provost prohibits the use by students of cell phones, pagers, PDAs, or similar communication devices during scheduled classes. All such devices must be turned off or put in a silent (vibrate) mode and ordinarily should not be taken out during class. Given the fact that these same communication devices are an integral part of the University's emergency notification system, an exception to this policy would occur when numerous devices activate simultaneously. When this occurs, students may consult their devices to determine if a university emergency exists. If that is not the case, the devices should be immediately returned to silent mode and put away. Other exceptions to this policy may be granted at the discretion of the instructor.

[Instructors note: This policy will also extend to use of Instant Messaging, text messaging, via cell phone, handheld, laptop, or any other method of utilizing cooperation between the student and an external source.]

MoSTEP High School (9-12) Chemistry (Categorical) Subject Area Competencies:

In completing this course, the beginning (preservice) Chemistry 9-12 teacher will demonstrate knowledge of and/or competency in the following areas of study:

1: Unifying Concepts and Processes The beginning teacher of science is familiar with, and teaches, the major concepts and principles that unify all scientific effort and that are used in each of the science disciplines (1997 SSC: 1.2; CR GenEd, III.Sc- Chem; NSTA [2001]: Standard 1; NSTA [1998], Standard 1; NSES: UCP- 1-5.

- 1.1 systems, order, and organization;
- 1.2 evidence, models, and explanation;
- 1.3 change, constancy, and measurement;
- 1.4 evolution and equilibrium; and
- 1.5 form and function

2: Science As Inquiry The beginning teacher of science understands and practices the science inquiry process. (1997 SSC: 1.1, 1.4; CR GenEd, III.Sc- Chem; NSTA [2001]: Standard 3, 9; NSTA [1998], Standard 3, 9; NSES: HA1, A2; S 1, 2, 7-81; ETS 0245: VI, VII)

- 2.1 identify questions and concepts that guide scientific investigations.
- 2.2 design and conduct scientific investigations, including understanding of the major concepts in the area being investigated, of proper equipment, of safety precautions; resolving methodological problems; using technologies; clarifying ideas that guide the inquiry; and obtaining scientific knowledge from sources other than the actual investigation; clarifying the question, method, controls, and variables; organizing and displaying data; revising methods and explanations; and public presentation of the results with a critical response from peers; using evidence; applying logic; and constructing an argument for the proposed explanations.
- 2.3 use appropriate tools (e.g., hand tools, measuring instruments, calculators, and computers for the collection, summary, and display of evidence), techniques, and mathematics to gather, analyze, and interpret data, including selecting the scientific apparatus or instrument appropriate to a specified laboratory or field task and identifying proper operation of such equipment; using the metric system of measurement, recognizing equivalents within that system and selecting units appropriate to a given laboratory or field task; converting between scientific notation and conventional numerals and using scientific notation to perform calculations.
- 2.4 formulate and revise scientific explanations and models using logic and evidence, including discussing, formulating, and revising an explanation or physical, conceptual, and/or mathematical models based on scientific knowledge, use of logic, and evidence from the investigation.
- 2.5 think critically and logically to make the relationships between evidence and explanations, including deciding what evidence should be used and accounting for anomalous data; reviewing data from an experiment, summarizing the data, and forming a logical argument about the cause-and-effect relationships in the experiment; and stating some explanations in terms of the relationship between two or more variables.
- 2.8 use mathematics in all aspects of scientific inquiry to ask questions; to gather, organize, and present data; and to structure convincing explanations.
- 2.9 handle, label, store, and dispose of chemicals, electrical equipment, and scientific apparatuses and take actions to prevent or report an emergencies, including, but not limited to, general first aid as it relates to incidents in the science classroom or laboratory. (NSTA 9.b)

3: Physical Science The beginning teacher of science understands the central concepts, tools of inquiry, and structures of the physical sciences and makes these aspects of subject matter meaningful for students. (1997 SSC: 2.1-2.8; CR GenEd, III.Sc-Chem; NSTA [2001]: Rationale; Standard 1; NSTA [1998], Standard 1; NSES: H-B1, B2, B3, B5, B6; S 1, 2, 7-8; ETS 0245: I, II, IV)

- 3.1 Structure of Atoms (NSES: H-B1)

- 3.2 Structure and Properties of Matter (1997 SSC: 2.1-.8; NSES: H-B2)
- 3.3 Interactions of Energy and Matter (1997 SSC: 2.1-.8; NSES: H-B6)
- 3.4 General Chemistry and Chemical Reactions in Physical and Life Science (1997 SSC: 2.2-.5; NSES: H-B3)

6: Science and Technology The beginning teacher of science understands the relationship between science and technology, can distinguish between natural objects and objects made by humans, and makes these aspects of subject matter meaningful for students by creating experiences in making models of useful things and by developing students' abilities to identify and communicate a problem and to design, implement, and evaluate a solution. (1997 SSC: 1.3, 1.4; NSTA [2001], Standards 4, 5.d; NSTA [1998] Standards 2, 4, 5; NSES: H-E1, E2, E3; S 8; ETS 0245: VI)

- 6.6 use computer and related technologies to extend investigative activities (NSES: H-E2)
- 6.7 identify and organize materials and other resources, choose suitable tools and techniques, and work with appropriate measurement methods to ensure adequate accuracy in the implementation of a proposed design. (NSES: H-E1)
- 6.8 analyze and interpret data obtained from an experiment or investigation, including graphical data, and identify and demonstrate an understanding of sources of error in data that is presented (NSES: H-E1)
- 6.9 demonstrate understanding of scientific measurement and notation systems, including systems for describing very large and very small units (NSES: H-E1)
- 6.10 collaborate as a team-member in the identification, communication, and resolution of scientific and technological problems. (NSES: H-E2)
- 6.12 use words, drawings, and models to communicate the process and products of technological design and scientific investigation (NSES: H-E1)
- 6.13 use criteria relevant to the original purpose or need to evaluate completed technological designs or products (NSES: H-E1)

MoSTEP 1.2.1.1: Unified Science 9-12 with Chemistry Competencies Approved by MSBE: 8/2008 The beginning (preservice) Unified Science 9-12: Chemistry teacher will demonstrate knowledge of and/or competency in the following areas of study:

1. Unifying Concepts (1997 SSC: 1.2, 1.4; NSTA [2003]: C.1; NSES: UCP-1-5)

- 1. Multiple ways our perceptions of the world are organized and how we use systems to organize the studies and knowledge of science.
- 2. Nature of scientific evidence and the use of models for explanation.
- 3. Measurement as a way of knowing and organizing observations of constancy and change.
- 4. Evolution of natural systems and factors that result in evolution or equilibrium.
- 5. Interrelationships of form, function, and behaviors in living and nonliving systems.

3. Inquiry (1997 SSC: 1.1, 1.4; CR: see note RE: Methods course; 1.1; NSTA [2003] 3; NSES: H-A1, A2; S 1, 2, 7-8; Praxis 0245: VI); NSES (NRC, 2000)

- 1. The processes, tenets, and assumptions of multiple methods of inquiry leading to scientific knowledge.
- 3. Engage scientifically oriented questions, give priority to evidence, formulate explanations from evidence, connect explanations to scientific knowledge, and communicate and justify explanations to others.

5. Safety and Welfare (1997 SSC: 1.7; CR: see DESE CR note RE: Methods course; NSTA [2003] 9.b, 9.c, 9.a; Praxis 0245: VII)

- 1. Handle, label, store, & dispose of chemicals, electrical equipment, & scientific apparatuses & take actions to prevent or report emergencies, including, but not limited to, general first aid as it relates to incidents in the science classroom or laboratory.

6. Chemistry Core Competencies (1997 SSC: 2.1-.8; NSTA C.3.a; CR: 2.c; NSES: H-B1, B2, B3, B5, B6; S 1, 2, 7-8; Praxis 0245: II, III, IV, V)

- 1. Fundamental structures of atoms and molecules.
- 2. Basic principles of ionic, covalent, and metallic bonding.
- 3. Physical and chemical properties and classification of elements including periodicity.
- 6. Mole

concept, stoichiometry, and laws of composition. 7. Transition elements and coordination compounds. 9. Fundamental biochemistry. 10. Functional and polyfunctional group chemistry. 12. Fundamental processes of investigating in chemistry, including laboratory skills.

9. Physics Core Competencies (1997 SSC: 3.1-7; CR: V.2.d; NSTA [2003]: C.5; NSES: H-B1, B2, B3, B5, B6; S 1, 2, 7-8; Praxis: ETS 0245: I, II, IV))

5. Physical properties of matter.

10. Chemistry Advanced Competencies (1997 SSC: 2.1-.8; NSTA C.3.b; CR: 2.c, 2.g; NSES: H-C1, C2, C5, C6; S 3, 4, 7-8; Praxis 0245: II, III, IV, V)

1. Molecular orbital theory, aromaticity, metallic and ionic structures, and correlation to properties of matter. 6. Major biological compounds and natural products. 7. Solvent system concepts including non-aqueous solvents. 8. Chemical reactivity and molecular structure including electronic and steric effects. 9. Organic synthesis and organic reaction mechanisms. 15. Systematic nomenclature of ionic and molecular compounds, including acids, and of organic compounds, including their functional groups.

CHM 200 LABORATORY SCHEDULE - FALL 2012

Mon	Tues	Wed	Thurs	Fri
20-Aug	21-Aug Intro/Safety/TECH 701 prelab	22-Aug	23-Aug Safety/TECH 701: MP of Comp/Mix	24-Aug
27-Aug	28-Aug TECH 703 prelab	29-Aug	30-Aug TECH 703: Purifying Acetanilide	31-Aug
3-Sep Labor Day Holiday	4-Sep Solubilities Prelab	5-Sep	6-Sep Solubilities (Handont)	7-Sep
10-Sep	11-Sep ANAL 445 prelab	12-Sep	13-Sep ANAL 445: Sep. ID of Dyes by ILC	14-Sep
17-Sep	18-Sep SYNT 471 prelab	19-Sep	20-Sep SYNT 471: Iso. Caff. from Tea	21-Sep
24-Sep	25-Sep TECH 705 prelab	26-Sep	27-Sep TECH 705: Sep. Acids & Neut. Comp.	28-Sep
1-Oct	2-Oct Review for Midterm Exam	3-Oct	4-Oct MIDTERM EXAM	5-Oct
8-Oct	9-Oct REAC 472 prelab	10-Oct	11-Oct REAC 472: Qual. Tests - Alkenes	12-Oct
13-Oct Midterm grades submitted	16-Oct	17-Oct	18-Oct	19-Oct
Fall Break on 18th and 19th: NO LAB THIS WEEK				
22-Oct	23-Oct REAC 469 prelab	24-Oct	25-Oct REAC 469: Qual. Tests - OH Group	26-Oct
29-Oct	30-Oct ANAL 727 prelab	31-Oct	1-Nov ANAL 727: Class. Unk. by Funct. Group	2-Nov
5-Nov	6-Nov REAC 716 prelab	7-Nov	8-Nov REAC 716: Nitration (modified procedure)	9-Nov
12-Nov	13-Nov SYNT 713 prelab	14-Nov	15-Nov SYNT 713: Prep. Isopentyl Acetate	16-Nov last day to drop/withdraw
19-Nov	20-Nov	21-Nov	22-Nov	23-Nov
Thanksgiving Holiday: NO LABS THIS WEEK				
26-Nov	27-Nov PROP 319 prelab	28-Nov	29-Nov PROP 319: Prep. Soap MANDATORY CLEANUP	30-Nov
3-Dec	4-Dec Review for Final Exam	5-Dec	6-Dec FINAL EXAM	7-Dec Study Day
10-Dec	11-Dec	12-Dec	13-Dec	14-Dec
Final Exams				Commencement

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CHM 200 LABORATORY SCHEDULE – FALL 2012

Mon	Tues	Wed	Thurs	Fri
20-Aug	21-Aug Intro/Safety/TECH 701 prelab	22-Aug	23-Aug Safety/TECH 701: MP of Comp Mix	24-Aug
27-Aug	28-Aug TECH 703 prelab	29-Aug	30-Aug TECH 703: Purifying Acetanilide	31-Aug
3-Sep Labor Day Holiday	4-Sep Solubilities Prelab	5-Sep	6-Sep Solubilities (Handout)	7-Sep
10-Sep	11-Sep ANAL 445 prelab	12-Sep	13-Sep ANAL 445: Sep./ID of Dyes by TLC	14-Sep
17-Sep	18-Sep SYNT 471 prelab	19-Sep	20-Sep SYNT 471: Iso. Caff. from Tea	21-Sep
24-Sep	25-Sep TECH 705 prelab	26-Sep	27-Sep TECH 705: Sep. Acids & Neut. Comp.	28-Sep
1-Oct	2-Oct Review for Midterm Exam	3-Oct	4-Oct MIDTERM EXAM	5-Oct
8-Oct	9-Oct REAC 472 prelab	10-Oct	11-Oct REAC 472: Qual. Tests - Alkenes	12-Oct
15-Oct Midterm grades submitted	16-Oct	17-Oct	18-Oct	19-Oct
Fall Break on 18th and 19th: NO LAB THIS WEEK				
22-Oct	23-Oct REAC 469 prelab	24-Oct	25-Oct REAC 469: Qual. Tests - OH Group	26-Oct
29-Oct	30-Oct ANAL 727 prelab	31-Oct	1-Nov ANAL 727: Class. Unk. by Funct. Group	2-Nov
5-Nov	6-Nov REAC 716 prelab	7-Nov	8-Nov REAC 716: Nitration (modified procedure)	9-Nov
12-Nov	13-Nov SYNT 713 prelab	14-Nov	15-Nov SYNT 713: Prep. Isopentyl Acetate	16-Nov last day to drop/withdraw
19-Nov	20-Nov	21-Nov	22-Nov	23-Nov
Thanksgiving Holiday: NO LABS THIS WEEK				
26-Nov	27-Nov PROP 319 prelab	28-Nov	29-Nov PROP 319: Prep. Soap/ MANDATORY CLEANUP	30-Nov
3-Dec	4-Dec Review for Final Exam	5-Dec	6-Dec FINAL EXAM	7-Dec Study Day
10-Dec	11-Dec	12-Dec	13-Dec	14-Dec
Final Exams				Commencement

Missouri State University Curricular Proposal Program Change or Deletion

Department Chemistry Date 11/29/2012

Title of Program Affected: **Chemistry Education, Bachelor of Science in Education**

Major Comprehensive Major Option Minor Certificate Certification Academic Rules Other

Present Catalog Description (Cut and paste from web catalog or use most recent description.)	Revised Catalog Description (Cut and paste description again, strikethrough all deletions, and insert and bold new information.)
<p>Chemistry Education Bachelor of Science in Education. (Certifiable grades 9-12)</p> <p>A. General Education Requirements - see General Education Program and Requirements section of catalog The following required courses can be used to meet both General Education and Major Requirements: BIO 121(4); CHM 160(4) and 161(1) or PHY 123(4) or GLG 110(4) or GLG 171(4); MTH 287(3)</p> <p>B. Major Requirements: 1. Core (31-36 hours): CHM 160(4), 161(1), 170(3), 171(1); CHM 200(5), or CHM 342(5) and CHM 343(5), or CHM 342(5) and CHM 344(3); CHM 302(5), 352(3), 435(2), 460(3), 505(4) Note: Students seeking American Chemical Society certification must take either CHM 342 and 343, or CHM 342 and 344. 2. Related Requirements (22 hours): PHY 123(4), 124(4); SCI 505(3); BIO 121(4); GLG 110(4) or GLG 171(4); MTH 287(3) 3. Complete the requirements in one of the following grades 9-12 certification areas: Categorical Science (3 hours): CHM 375(3) Unified Science (13 hours): CHM 463(1); BIO 122(4); GLG 110(4); GRY 135(4)</p> <p>C. Professional Education courses (37 hours) 1. SCI 214(1), 314(3), 414(3), 493(6), 494(6) 2. Professional Education Required Core and Competencies - see Teacher Certification, Teacher Education Program and Secondary Education Requirements section of catalog</p> <p>D. This program also requires compliance with the Teacher Education Program requirements for eligibility to enroll in Professional Education courses; admission to and continuance in the Teacher Education Program; approval for supervised teaching; and recommendation for certification; as well as the requirements for Secondary Education. Refer to the Teacher Education Program section of the catalog for requirements.</p> <p>E. General Baccalaureate Degree Requirements - see General Baccalaureate Degree Requirements section of catalog</p> <p>F. In order to meet Missouri state teacher certification requirements, candidates for the Bachelor of Science in Education degree are required to meet the following grade point average requirements: at least a 2.50 GPA on all course work attempted at all colleges attended; at least a 2.50 GPA in the certificate subject area (major field of study) which includes all courses listed under B; at least a 2.50 GPA in any additional certificate subject area; at least a 2.50 GPA in the professional education courses; and no grade lower than a "C" in all professional education courses. All GPA requirements include both Missouri State and transfer grades.</p>	<p>Chemistry Education Bachelor of Science in Education (Certifiable grades 9-12)</p> <p>A. General Education Requirements - see General Education Program and Requirements section of catalog The following required courses can be used to meet both General Education and Major Requirements: BIO 121(4); CHM 160(4) and 161(1) or PHY 123(4) or GLG 110(4) or GLG 171(4); MTH 287(3)</p> <p>B. Major Requirements: 1. Core (31-36 hours): CHM 160(4), 161(1), 170(3), 171(1); CHM 200(5), 201(3) and CHM 202(2), or CHM 342(5) and CHM 343(5), or CHM 342(5) and CHM 344(3); CHM 302(5), 352(3), 435(2), 460(3), 505(4) Note: Students seeking American Chemical Society certification must take either CHM 342 and 343, or CHM 342 and 344.</p> <p>2. Related Requirements (22 hours): PHY 123(4), 124(4); SCI 505(3); BIO 121(4); GLG 110(4) or GLG 171(4); MTH 287(3) 3. Complete the requirements in one of the following grades 9-12 certification areas: Categorical Science (3 hours): CHM 375(3) Unified Science (13 hours): CHM 463(1); BIO 122(4); GLG 110(4); GRY 135(4)</p> <p>C. Professional Education courses (37 hours) 1. SCI 214(1), 314(3), 414(3), 493(6), 494(6) 2. Professional Education Required Core and Competencies - see Teacher Certification, Teacher Education Program and Secondary Education Requirements section of catalog</p> <p>D. This program also requires compliance with the Teacher Education Program requirements for eligibility to enroll in Professional Education courses; admission to and continuance in the Teacher Education Program; approval for supervised teaching; and recommendation for certification; as well as the requirements for Secondary Education. Refer to the Teacher Education Program section of the catalog for requirements.</p> <p>E. General Baccalaureate Degree Requirements - see General Baccalaureate Degree Requirements section of catalog</p> <p>F. In order to meet Missouri state teacher certification requirements, candidates for the Bachelor of Science in Education degree are required to meet the following grade point average requirements: at least a 2.50 GPA on all course work attempted at all colleges attended; at least a 2.50 GPA in the certificate subject area (major field of study) which includes all courses listed under B; at least a 2.50 GPA in any additional certificate subject area; at least a 2.50 GPA in the professional education courses; and no grade lower than a "C" in all professional education courses. All GPA requirements include both Missouri State and transfer grades.</p>

What is changing? Check all boxes that apply.

- Title change
- Course changes of under 18 hours
- Course changes of 18 hours or more
- From option to program (major)
- From program (major) to option
- Program or option deletion
- Other _____

REASON FOR PROPOSED CHANGE

The department is changing the course numbering for the Essentials of Organic chemistry courses, and splitting into a lecture only and lab only classes. This reflects that change without altering any requirements.

COMPLETE NEW CATALOG INFORMATION (Typed)

Chemistry Education

Bachelor of Science in Education
(Certifiable grades 9-12)

A. General Education Requirements - see General Education Program and Requirements section of catalog

The following required courses can be used to meet both General Education and Major Requirements: BIO 121(4); PHY 123(4) or GLG 110(4) or GLG 171(4); MTH 287(3)

B. Major Requirements:

1. Core (31-36 hours): CHM 160(4), 161(1), 170(3), 171(1); CHM 201(3) and CHM 202(2), or CHM 342(5) and CHM 343(5), or CHM 342(5) and CHM 344(3); CHM 302(5), 352(3), 435(2), 460(3), 505(4)

2. Related Requirements (22 hours): PHY 123(4), 124(4); SCI 505(3); BIO 121(4); GLG 110(4) or GLG 171(4); MTH 287(3)

3. Complete the requirements in one of the following grades 9-12 certification areas:

Categorical Science (3 hours): CHM 375(3)

Unified Science (13 hours): CHM 463(1); BIO 122(4); GLG 110(4); GRY 135(4)

C. Professional Education courses (37 hours)

1. SCI 214(1), 314(3), 414(3), 493(6), 494(6)

2. Professional Education Required Core and Competencies - see Teacher Certification, Teacher Education Program and Secondary Education Requirements section of catalog

D. This program also requires compliance with the Teacher Education Program requirements for eligibility to enroll in Professional Education courses; admission to and continuance in the Teacher Education Program; approval for supervised teaching; and recommendation for certification; as well as the requirements for Secondary Education. Refer to the Teacher Education Program section of the catalog for requirements.

E. General Baccalaureate Degree Requirements - see General Baccalaureate Degree Requirements section of catalog

F. In order to meet Missouri state teacher certification requirements, candidates for the Bachelor of Science in Education degree are required to meet the following grade point average requirements: at least a 2.50 GPA on all course work attempted at all colleges attended; at least a 2.50 GPA in the certificate subject area (major field of study) which includes all courses listed under B; at least a 2.50 GPA in any additional certificate subject area; at least a 2.50 GPA in the professional education courses; and no grade lower than a "C" in all professional education courses. All GPA requirements include both Missouri State and transfer grades.

Total Hours 69-87

DEPARTMENT: Route according to ART VI, SEC 3B(1-4) of Bylaws of the Faculty Senate. Forward three typed, originally signed forms to one of the following (please check all that apply and send to first council/committee marked). If the program needs to go through more than one committee/council, forward one additional form for each additional council/ committee marked.

College Council (Send all undergraduate program changes through College Council as first step before forwarding either to PEC, CGEIP, or directly to Faculty Senate)

Professional Education Committee (Considers all program changes affecting BS and MS in Education and Educational Specialist degrees)

Committee on General Education and Intercollegiate Programs (Considers all general education and multi-college program changes)

Graduate Council (Considers all graduate-level program changes)

Signature [Handwritten Signature]
Department Head

Date 11/29/12

(Routing on Reverse Side)

FS Program Change - 9/10/2010

7

Missouri State University
Curricular Proposal Program Change or Deletion

Department Chemistry Date 11/29/2012
 Title of Program Affected Chemistry (Minor) Bachelor of Science, Bachelor of Art
 Major Comprehensive Major Option Minor X Certificate Academic Rules Other

Present Catalog Description (Cut and paste from web catalog or use most recent description.)	Revised Catalog Description (Cut and paste description again, strikethrough all deletions, and insert and bold new information.)
<p>Chemistry (Minor) Bachelor of Arts Bachelor of Science A. CHM 160(4), 161(1), 170(3), 171(1); CHM 200(5) or CHM 342(5) B. Select an emphasis area from the options below: 1. Analytical: CHM 302(5) 2. Biochemistry: CHM 352(3) and 353(2); or CHM 452(3) and 453(2) 3. Environmental: CHM 460(3) and 461(3) 4. Inorganic: CHM 375(3) and 376(2) 5. Organic: CHM 343(5) or 344(3); and CHM 514(3) or CHM 542(3) 6. Physical: CHM 506(3); and CHM 507(3) or 508(2) 7. Student Option: Select at least 8 hours in CHM courses numbered 302 or higher.</p>	<p>Chemistry (Minor) Bachelor of Arts Bachelor of Science A. CHM 160(4), 161(1), 170(3), 171(1); CHM 200(5) 201 (3) and 202 (2), or CHM 342(5) B. Select an emphasis area from the options below: 1. Analytical: CHM 302(5) 2. Biochemistry: CHM 352(3) and 353(2); or CHM 452(3) and 453(2) 3. Environmental: CHM 460(3) and 461(3) 4. Inorganic: CHM 375(3) and 376(2) 5. Organic: CHM 343(5) or 344(3); and CHM 514(3) or CHM 542(3) 6. Physical: CHM 506(3); and CHM 507(3) or 508(2) 7. Student Option: Select at least 8 hours in CHM courses numbered 302 or higher.</p>

What is changing? Check all boxes that apply.

- Title change
 Course changes of under 18 hours
 Course changes of 18 hours or more
 From option to program (major)
 From program (major) to option
 Program or option deletion
 Other _____

REASON FOR PROPOSED CHANGE

The department is changing the course numbering for the Essentials of Organic chemistry courses, and splitting into a lecture only and lab only classes. This reflects that change without altering any requirements.

COMPLETE NEW CATALOG INFORMATION (Typed)

Chemistry (Minor)


- Bachelor of Arts
 Bachelor of Science
 A. CHM 160(4), 161(1), 170(3), 171(1); CHM 201(3) and 202(2), or CHM 342(5)
 B. Select an emphasis area from the options below:
 1. Analytical: CHM 302(5)
 2. Biochemistry: CHM 352(3) and 353(2); or CHM 452(3) and 453(2)
 3. Environmental: CHM 460(3) and 461(3)
 4. Inorganic: CHM 375(3) and 376(2)
 5. Organic: CHM 343(5) or 344(3); and CHM 514(3) or CHM 542(3)
 6. Physical: CHM 506(3); and CHM 507(3) or 508(2)
 7. Student Option: Select at least 8 hours in CHM courses numbered 302 or higher.

Total Hours 69-87

DEPARTMENT: Route according to ART VI, SEC 3B(1-4) of Bylaws of the Faculty Senate. Forward three typed, originally signed forms to one of the following (please check all that apply and send to first council/committee marked).

If the program needs to go through more than one committee/council, forward one additional form for each additional council/ committee marked.

- College Council (Send all undergraduate program changes through College Council as first step before forwarding either to PEC, CGEIP, or directly to Faculty Senate)
 Professional Education Committee (Considers all program changes affecting BS and MS in Education and Educational Specialist degrees)
 Committee on General Education and Intercollegiate Programs (Considers all general education and multi-college program changes)
 Graduate Council (Considers all graduate-level program changes)

Signature  _____
 Department Head

Date 11/29/12

Missouri State University Curricular Proposal Course Change or Deletion

Department CHM

Date 11/29/12

Check one: This is a change to an existing COURSE
 an existing REGULAR (i.e. permanent) SECTION of a variable content course

Present Catalog Description (Cut and paste from web catalog or use most recent description.)	Revised Catalog Description (Cut and paste description again, strikethrough all deletions, and insert and bold new information.)
CHM 201 Essentials of Organic Chemistry Prerequisite: a "C-" grade or better in CHM 105 or CHM 106 or CHM 160. Principles of organic chemistry and biochemistry. Identical to lecture portion of CHM 200. Cannot receive credit for both CHM 200 and CHM 201. Does not apply toward a chemistry major or minor if student passes CHM 342. 3(3-0) F,S	CHM 201 Essentials of Organic Chemistry Prerequisite: a "C-" grade or better in CHM 105 or CHM 106 CHM116 or CHM 170 . Principles of organic chemistry and biochemistry. The laboratory associated with this course is CHM202 (Essentials of Organic Chemistry Laboratory). Identical to lecture portion of CHM 200. Cannot receive credit for both CHM 200 and CHM 201. Does not apply toward a chemistry major or minor if student passes CHM 342. 3(3-0) F,S

What is changing? Check all boxes that apply.

- Course Deletion Course Code Course Number Title Prerequisite
 Credit Hours/Contact Hours Periodicity Description

Reason for Proposed Change or Deletion

The courses CHM200 (lecture and lab) and 201 (lecture only) are being altered to have a single course which is lecture only (CHM201) and a single course that is the associated lab (CHM202). This will alleviate problems with student registration and advising associated with transfer credits from institutions where these courses were separate. The numbering is now consistent with the rest of the course numberings in the department.

How Did You Determine the Need For This Change or Deletion?

There have been a large numbering of transfer credit problems associated with these courses. This will also allow for separation of grades in the performance of these courses. The Registrar's office suggested structuring these proposed changes in this fashion to alleviate as many registration problems as possible.

COMPLETE NEW CATALOG INFORMATION (typed)

CHM 201 Essentials of Organic Chemistry

Prerequisite: a "C-" grade or better in CHM116 or CHM 170. Principles of organic chemistry and biochemistry. The laboratory associated with this course is CHM202 (Essentials of Organic Chemistry Laboratory). Does not apply toward a chemistry major or minor if student passes CHM 342. 3(3-0) F,S

Check if this is a **non-substantive** change. Distribution for non-substantive changes of 100- through 500-level courses: two originally-signed copies to Faculty Senate; 600- through 900-level courses: three originally-signed copies to Graduate Council. Graduate Council will give two copies to Faculty Senate after approval.

Substantive Change: Department routes according to ART VI, SEC 3B(1-4) of Bylaws of the Faculty. Forward three originally signed forms to one of the following (please check all that apply and send to first council/committee marked). If proposal needs to go through more than one council/committee, forward one additional form for each additional council/committee marked. See Senate Action 11-93/94 for definitions of substantive/non-substantive changes.

College Council

(All substantive course changes numbered 100-599 must go through College Council first. After approval, College Council will forward appropriate number of copies to the next committee/council or directly to the Faculty Senate if no further committee approval is needed. The last level of committee/council will forward two originally signed copies to the Faculty Senate.)

Professional Education Committee

(Considers all substantive course changes for Professional Education courses and Teaching Methods courses.)

Committee on General Education and Intercollegiate Programs

(Considers all substantive course changes for General Education and Intercollegiate Program proposals.)

Graduate Council

(Considers all 600-900 level course changes.)

Signature


Department Head

Date

11/29/12

(Routing on Reverse Side)

9

Missouri State University Curricular Proposal Course Change or Deletion

Department CHM

Date 11/29/12

Check one: This is a change to an existing COURSE
 an existing REGULAR (i.e. permanent) SECTION of a variable content course

Present Catalog Description (Cut and paste from web catalog or use most recent description.)	Revised Catalog Description (Cut and paste description again, strikethrough all deletions, and insert and bold new information.)
<p>CHM 460 Environmental Chemistry I</p> <p>Prerequisite: "C-" or better in CHM 170; and "C-" or better in CHM 200 or CHM 342. Recommended Prerequisite: CHM 302. Chemistry of water and soil, water treatment, agricultural chemistry and related topics. May be taught concurrently with CHM 760. Cannot receive credit for both CHM 460 and CHM 760. 3(3-0) F</p>	<p>CHM 460 Environmental Chemistry I: Water and Land</p> <p>Prerequisite: "C-" or better in CHM 170; and "C-" or better in CHM 200 201 or CHM 342. Recommended Prerequisite: CHM 302. Chemistry of water and soil, water treatment, agricultural chemistry and related topics. May be taught concurrently with CHM 760. Cannot receive credit for both CHM 460 and CHM 760. 3(3-0) F</p>

What is changing? Check all boxes that apply.

- Course Deletion Course Code Course Number Title Prerequisite
 Credit Hours/Contact Hours Periodicity Description

Reason for Proposed Change or Deletion

CHM460 Environmental Chemistry I and CHM461 Environmental Chemistry II have evolved into distinct courses, and CHM460 is not required for CHM461. However, the "I" and "II" designations give the impression that CHM461 must follow CHM460. Replacing the I and II in the titles and adding course topic descriptors, "Water and Land" for CHM460, should help clarify the separation of the two classes. Prerequisites updated to reflect change from CHM200 to CHM201.

How Did You Determine the Need For This Change or Deletion?

Frequent questions from students who thought the courses were sequential.

COMPLETE NEW CATALOG INFORMATION (typed)

CHM 460 Environmental Chemistry: Water and Land

Prerequisite: "C-" or better in CHM 170; and "C-" or better in CHM 201 or CHM 342. Recommended Prerequisite: CHM 302. Chemistry of water and soil, water treatment, agricultural chemistry and related topics. May be taught concurrently with CHM 760. Cannot receive credit for both CHM 460 and CHM 760. 3(3-0) F

Check if this is a **non-substantive** change. Distribution for non-substantive changes of 100- through 500-level courses: two originally-signed copies to Faculty Senate; 600- through 900-level courses: three originally-signed copies to Graduate Council. Graduate Council will give two copies to Faculty Senate after approval.

Substantive Change: Department routes according to ART VI, SEC 3B(1-4) of Bylaws of the Faculty. Forward three originally signed forms to one of the following (please check all that apply and send to first council/committee marked). If proposal needs to go through more than one council/committee, forward one additional form for each additional council/committee marked. See Senate Action 11-93/94 for definitions of substantive/non-substantive changes.

College Council

(All substantive course changes numbered 100-599 must go through College Council first. After approval, College Council will forward appropriate number of copies to the next committee/council or directly to the Faculty Senate if no further committee approval is needed. The last level of committee/council will forward two originally signed copies to the Faculty Senate.)

Professional Education Committee

(Considers all substantive course changes for Professional Education courses and Teaching Methods courses.)

Committee on General Education and Intercollegiate Programs

(Considers all substantive course changes for General Education and Intercollegiate Program proposals.)

Graduate Council

(Considers all 600-900 level course changes.)

Signature  Department Head

Date 11/29/12

10

Missouri State University
Curricular Proposal Course Change or Deletion

Department CHM Date 11/29/12

Check one: This is a change to an existing COURSE
 an existing REGULAR (i.e. permanent) SECTION of a variable content course

Present Catalog Description (Cut and paste from web catalog or use most recent description.)	Revised Catalog Description (Cut and paste description again, strikethrough all deletions, and insert and bold new information.)
<p>CHM 461 Environmental Chemistry II</p> <p>Prerequisite: "C-" or better in CHM 200 or CHM 342. Recommended Prerequisite: some advanced coursework in chemistry, geosciences, biology, or related fields. Atmospheric chemistry; pollution issues related to power production and transportation; energy sources and fuels. May be taught concurrently with CHM 761. Cannot receive credit for both CHM 461 and CHM 761. 3(3-0) S</p>	<p>CHM 461 Environmental Chemistry II: Air and Energy</p> <p>Prerequisite: "C-" or better in CHM 200 201 or CHM 342. Recommended Prerequisite: some advanced coursework in chemistry, geosciences, biology, or related fields. Atmospheric chemistry; pollution issues related to power production and transportation; energy sources and fuels. May be taught concurrently with CHM 761. Cannot receive credit for both CHM 461 and CHM 761. 3(3-0) S</p>

What is changing? Check all boxes that apply.

- Course Deletion Course Code Course Number Title Prerequisite
 Credit Hours/Contact Hours Periodicity Description

Reason for Proposed Change or Deletion

CHM460 Environmental Chemistry I and CHM461 Environmental Chemistry II have evolved into distinct courses, and CHM460 is not required for CHM461. However, the "I" and "II" designations give the impression that CHM461 must follow CHM460. Replacing the I and II in the titles and adding course topic descriptors, "Air and Energy" for CHM461, should help clarify the separation of the two classes. Prerequisites updated to reflect change from CHM200 to CHM201.

How Did You Determine the Need For This Change or Deletion?

Frequent questions from students who believed the courses were sequential.

COMPLETE NEW CATALOG INFORMATION (typed)

CHM 461 Environmental Chemistry: Air and Energy

Prerequisite: "C-" or better in CHM 201 or CHM 342. Recommended Prerequisite: some advanced coursework in chemistry, geosciences, biology, or related fields. Atmospheric chemistry; pollution issues related to power production and transportation; energy sources and fuels. May be taught concurrently with CHM 761. Cannot receive credit for both CHM 461 and CHM 761. 3(3-0) S

Check if this is a **non-substantive** change. Distribution for non-substantive changes of 100- through 500-level courses: two originally-signed copies to Faculty Senate; 600- through 900-level courses: three originally-signed copies to Graduate Council. Graduate Council will give two copies to Faculty Senate after approval.

Substantive Change: Department routes according to ART VI, SEC 3B(1-4) of Bylaws of the Faculty. Forward three originally signed forms to one of the following (please check all that apply and send to first council/committee marked). If proposal needs to go through more than one council/committee, forward one additional form for each additional council/committee marked. See Senate Action 11-93/94 for definitions of substantive/non-substantive changes.

- College Council** (All substantive course changes numbered 100-599 must go through College Council first. After approval, College Council will forward appropriate number of copies to the next committee/council or directly to the Faculty Senate if no further committee approval is needed. The last level of committee/council will forward two originally signed copies to the Faculty Senate.)
- Professional Education Committee** (Considers all substantive course changes for Professional Education courses and Teaching Methods courses.)
- Committee on General Education and Intercollegiate Programs** (Considers all substantive course changes for General Education and Intercollegiate Program proposals.)
- Graduate Council** (Considers all 600-900 level course changes.)

Signature [Signature]
 Department Head

Date 11/29/12

(Routing on Reverse Side)

11

Missouri State University Curricular Proposal Course Change or Deletion

Department CHM

Date 11/29/12

Check one: This is a change to an existing COURSE
 an existing REGULAR (i.e. permanent) SECTION of a variable content course

Present Catalog Description (Cut and paste from web catalog or use most recent description.)	Revised Catalog Description (Cut and paste description again, strikethrough all deletions, and insert and bold new information.)
<p>CHM 760 Chemistry of Environmental Systems I</p> <p>Chemistry of water and soil, water treatment, agricultural chemistry, and related topics. May be taught concurrently with CHM 460. Cannot receive credit for both CHM 460 and CHM 760. 3(3-0) F</p>	<p>CHM 760 Chemistry of Environmental Systems I : Water and Land</p> <p>Recommended Prerequisite: some advanced coursework in chemistry, geosciences, biology, or related fields. Chemistry of water and soil, water treatment, agricultural chemistry, and related topics. May be taught concurrently with CHM 460. Cannot receive credit for both CHM 460 and CHM 760. 3(3-0) F</p>

What is changing? Check all boxes that apply.

- Course Deletion Course Code Course Number Title Prerequisite
 Credit Hours/Contact Hours Periodicity Description

Reason for Proposed Change or Deletion

CHM760 Chemistry of Environmental Chemistry I and CHM761 Chemistry of Environmental Chemistry II have evolved into distinct courses, and CHM760 is not required for CHM761. However, the "I" and "II" designations give the impression that CHM761 must follow CHM760. Replacing the I and II in the titles and adding course topic descriptors, "Water and Land" for CHM760, should help clarify the separation of the two classes. Recommended prerequisites have been added.

How Did You Determine the Need For This Change or Deletion?

Frequent questions from students who thought the courses were sequential.

COMPLETE NEW CATALOG INFORMATION (typed)

CHM 760 Chemistry of Environmental Systems: Water and Land

Recommended Prerequisite: some advanced coursework in chemistry, geosciences, biology, or related fields. Chemistry of water and soil, water treatment, agricultural chemistry, and related topics. May be taught concurrently with CHM 460. Cannot receive credit for both CHM 460 and CHM 760. 3(3-0) F

Check if this is a **non-substantive** change. Distribution for non-substantive changes of 100- through 500-level courses: two originally-signed copies to Faculty Senate; 600- through 900-level courses: three originally-signed copies to Graduate Council. Graduate Council will give two copies to Faculty Senate after approval.

Substantive Change: Department routes according to ART VI, SEC 3B(1-4) of Bylaws of the Faculty. Forward three originally signed forms to one of the following (please check all that apply and send to first council/committee marked). If proposal needs to go through more than one council/committee, forward one additional form for each additional council/committee marked. See Senate Action 11-93/94 for definitions of substantive/non-substantive changes.

College Council

(All substantive course changes numbered 100-599 must go through College Council first. After approval, College Council will forward appropriate number of copies to the next committee/council or directly to the Faculty Senate if no further committee approval is needed. The last level of committee/council will forward two originally signed copies to the Faculty Senate.)

Professional Education Committee

(Considers all substantive course changes for Professional Education courses and Teaching Methods courses.)

Committee on General Education and Intercollegiate Programs

(Considers all substantive course changes for General Education and Intercollegiate Program proposals.)

Graduate Council

(Considers all 600-900 level course changes.)

Signature

Department Head

Date

11/29/12

12

Missouri State University Curricular Proposal Course Change or Deletion

Department CHM Date _____

Check one: This is a change to an existing COURSE
 an existing REGULAR (i.e. permanent) SECTION of a variable content course

Present Catalog Description (Cut and paste from web catalog or use most recent description.)	Revised Catalog Description (Cut and paste description again, strikethrough all deletions, and insert and bold new information.)
CHM 761 Chemistry of Environmental Systems II Prerequisite: CHM 760. Recommended Prerequisite: some advanced coursework in chemistry, geosciences, biology, or related fields. Atmospheric chemistry; pollution issues related to power production and transportation; energy sources and fuels. May be taught concurrently with CHM 461. Cannot receive credit for both CHM 761 and CHM 461. 3(3-0) S	CHM 761 Chemistry of Environmental Systems-II: Air and Energy Prerequisite: CHM 760 . Recommended Prerequisite: some advanced coursework in chemistry, geosciences, biology, or related fields. Atmospheric chemistry; pollution issues related to power production and transportation; energy sources and fuels. May be taught concurrently with CHM 461. Cannot receive credit for both CHM 761 and CHM 461. 3(3-0) S

What is changing? Check all boxes that apply.

- Course Deletion Course Code Course Number Title Prerequisite
 Credit Hours/Contact Hours Periodicity Description

Reason for Proposed Change or Deletion

CHM760 Chemistry of Environmental Chemistry I and CHM761 Chemistry of Environmental Chemistry II have evolved into distinct courses, and CHM760 is not required for CHM761. However, the "I" and "II" designations give the impression that CHM761 must follow CHM760. Replacing the I and II in the titles and adding course topic descriptors, "Air and Energy" for CHM761, should help clarify the separation of the two classes.

How Did You Determine the Need For This Change or Deletion?

Frequent questions from students who believed the courses were sequential.

COMPLETE NEW CATALOG INFORMATION (typed)

CHM 761 Chemistry of Environmental Systems: Air and Energy

Recommended Prerequisite: some advanced coursework in chemistry, geosciences, biology, or related fields. Atmospheric chemistry; pollution issues related to power production and transportation; energy sources and fuels. May be taught concurrently with CHM 461. Cannot receive credit for both CHM 761 and CHM 461. 3(3-0) S

Check if this is a **non-substantive** change. Distribution for non-substantive changes of 100- through 500-level courses: two originally-signed copies to Faculty Senate; 600- through 900-level courses: three originally-signed copies to Graduate Council. Graduate Council will give two copies to Faculty Senate after approval.

Substantive Change: Department routes according to ART VI, SEC 3B(1-4) of Bylaws of the Faculty. Forward three originally signed forms to one of the following (please check all that apply and send to first council/committee marked). If proposal needs to go through more than one council/committee, forward one additional form for each additional council/committee marked. See Senate Action 11-93/94 for definitions of substantive/non-substantive changes.

College Council

(All substantive course changes numbered 100-599 must go through College Council first. After approval, College Council will forward appropriate number of copies to the next committee/council or directly to the Faculty Senate if no further committee approval is needed. The last level of committee/council will forward two originally signed copies to the Faculty Senate.)

Professional Education Committee

(Considers all substantive course changes for Professional Education courses and Teaching Methods courses.)

Committee on General Education and Intercollegiate Programs

(Considers all substantive course changes for General Education and Intercollegiate Program proposals.)

Graduate Council

(Considers all 600-900 level course changes.)

Signature _____
Department Head

Date 11/29/12

(Routing on Reverse Side)

13

Missouri State University
Curricular Proposal Course Change or Deletion

Department CHM

Date 11/29/12

Check one: This is a change to an existing COURSE
 an existing REGULAR (i.e. permanent) SECTION of a variable content course

Present Catalog Description (Cut and paste from web catalog or use most recent description.)	Revised Catalog Description (Cut and paste description again, strikethrough all deletions, and insert and bold new information.)
<p>CHM 200 Essentials of Organic Chemistry</p> <p>Prerequisite: "C-" grade or better in either CHM 105; or CHM 160 and CHM 161. Principles of organic chemistry and biochemistry. Does not apply toward a chemistry major or minor if the student passes CHM 342. A grade of "C-" or better is required in this course in order to take CHM 352. May not be taken Pass/Not Pass. Lecture portion identical to CHM 201. Cannot receive credit for both CHM 200 and CHM 201. Supplemental course fee. 5(4-3) F,S</p>	

What is changing? Check all boxes that apply.

- Course Deletion
 Course Code
 Course Number
 Title
 Prerequisite
 Credit Hours/Contact Hours
 Periodicity
 Description

Reason for Proposed Change or Deletion

The courses CHM200 (lecture and lab) and 201 (lecture only) are being altered to have a single course which is lecture only (CHM201) and a single course that is the associated lab (CHM202). This will alleviate problems with student registration and advising associated with transfer credits from institutions where these courses were separate. The numbering is now consistent with the rest of the course numberings in the department.

How Did You Determine the Need For This Change or Deletion?

There have been a large numbering of transfer credit problems associated with these courses. This will also allow for separation of grades in the performance of these courses. The Registrar's office suggested structuring these proposed changes in this fashion to alleviate as many registration problems as possible.

COMPLETE NEW CATALOG INFORMATION (typed)

Check if this is a **non-substantive** change. Distribution for non-substantive changes of 100- through 500-level courses: two originally-signed copies to Faculty Senate; 600- through 900-level courses: three originally-signed copies to Graduate Council. Graduate Council will give two copies to Faculty Senate after approval.

Substantive Change: Department routes according to ART VI, SEC 3B(1-4) of Bylaws of the Faculty. Forward three originally signed forms to one of the following (please check all that apply and send to first council/committee marked). If proposal needs to go through more than one council/committee, forward one additional form for each additional council/committee marked. See Senate Action 11-93/94 for definitions of substantive/non-substantive changes.

- College Council** (All substantive course changes numbered 100-599 must go through College Council first. After approval, College Council will forward appropriate number of copies to the next committee/council or directly to the Faculty Senate if no further committee approval is needed. The last level of committee/council will forward two originally signed copies to the Faculty Senate.)
 Professional Education Committee (Considers all substantive course changes for Professional Education courses and Teaching Methods courses.)
 Committee on General Education and Intercollegiate Programs (Considers all substantive course changes for General Education and Intercollegiate Program proposals.)
 Graduate Council (Considers all 600-900 level course changes.)

Signature 
 Department Head

Date 11/29/12

(Routing on Reverse Side)

14

Missouri State University
CURRICULAR PROPOSAL
NEW COURSE (or new REGULAR SECTION of an existing variable content course)

Department Computer Science

Date 1/8/2012

Check one: New COURSE New REGULAR (i.e. permanent) SECTION of an existing variable content course. If a new regular section of an existing variable topics course, to what existing course is it to be attached? _____

PROPOSED CATALOG DESCRIPTION

CSC 201 Public Affairs Issues in Computing

Prerequisite: 12 credit hours. An introduction to public affairs issues in computing. Topics include civic applications, public sources of data, data and computer system security, opportunities and dangers of artificial intelligence and data mining, social media and computer mediated collaboration, and cultural factors in the internationalization of software. Students will design a civic application or system intended to serve the public good. 3(3-0) F,S

PURPOSE OF COURSE

To introduce students to public affairs issues in computing—students will consider how computing can be used to serve the public good and will learn how to find and use public sources of data. In addition, students will learn how they can protect computer systems from malicious hackers and keep data secure.

RELATIONSHIP TO OTHER DEPARTMENTS

This course will be proposed as a General Education course under the Public Affairs requirement. If it is approved in that role, students from any department may take it to fulfill that requirement. Other than its potential place in the General Education curriculum, this course has no relationship to other departments.

DEPARTMENT: Route according to ART VI, SEC 3B(1-4) of Bylaws of the Faculty. Attach New Course Resource Information form (FS 300a/05) and forward three typed, originally signed forms to one of the following (please check all that apply and send to first council/committee marked). If the course needs to go through more than one council/committee forward one additional form for each additional council/committee marked.

- College Council (All new course proposals numbered 100-599 must go through College Council first. After approval, College Council will forward appropriate number of copies to the next committee/ council or directly to the Faculty Senate if no further committee approval is needed.)
- Professional Education Committee (Considers all new courses affecting BS and MS in Education and Educational Specialist degrees)
- Committee on General Education and Intercollegiate Programs (Considers all general education and multi-college new course proposals)
- Graduate Council (Considers all 600-, 700-, and 800-level new courses)

*If the course needs to go through more than one council/committee, forward one additional form for each additional council/committee marked.

Signature Kenneth Tolman
Department Head

Date 1/8/2013

(Routing on Reverse Side)

NEW COURSE RESOURCE INFORMATION

Department Computer Science Date 1/8/2013Course Number and Title CSC 201 Public Affairs Issues in ComputingAnticipated Average Enrollment 300 (semester) Maximum Enrollment Limit 300Faculty Load Assignment 3 Equated Hours

1 Is another course being deleted? If so, give course number and title.

No

2 What will this course require in the way of:

Additional library holdings? None

Additional computer resources? None

Additional or remodeled facilities? None

Additional equipment or supplies? None

Additional travel funds? None

Additional faculty--general vs specialized? None

Other additional expenses? None

3 If additional faculty are not required, how will faculty be made available to teach this course?

CSC 101, a Basic Required Course in the current General Education curriculum, is not suited to the proposed General Education curriculum. For that reason, there will be many fewer sections of it taught, thus freeing resources for teaching CSC 201.

List names of current faculty qualified to teach this course:

Michael Scroggins, Harry Shea, Hui Liu, Jamil Saquer, Eric Shade, Lloyd Smith, Ken Vollmar, Yang Wang

4 What is the anticipated source of students for this course? (If from within the department, will students be taking this course in addition to or in place of other courses? If from outside the department, which courses in other departments would most likely be affected?)

This course is proposed to fulfill the Public Affairs requirement of the new General Education curriculum. At this point, it is difficult to say which courses in other departments would most likely be affected because this is a new General Education requirement.

5 Other comments:

CSC 201, Public Affairs Issues in Computing

Instructor: Dr Lloyd Smith **Office:** CHEK 316 **Phone:** 836-4834 **Email:** lloydsmith@missouristate.edu

Class meeting times: TBA

Course Description: An introduction to public affairs issues in computing. Topics include civic applications, public sources of data, data security, opportunities and dangers of artificial intelligence and data mining, social media and computer mediated collaboration, and cultural factors in the internationalization of software. Students will design a civic application or system intended to serve the public good. 3 credit hours (3-0).

Course Pre-requisites: 12 hours and Quantitative Literacy requirement satisfied

Required Texts: *Computers and Society: Computing for Good*, Lisa Kaczmarczyk, Chapman and Hall, 2011.

SPECIFIC STUDENT LEARNING OUTCOMES

Students will be able to

1. Identify personally and socially relevant problems that may be completely or partially solved through the use of computing technology and devise a reasonable solution to those problems
2. Identify relevant information sources, make reasoned choices among those sources, and open-mindedly follow where those sources lead
3. Justify conclusions reached in the analysis of information
4. Develop novel and creative solutions to personally and socially relevant problems
5. Take account of novel, alternative, contradictory, and even radical viewpoints in creating new ideas, products, or solutions appropriate to the use of computing
6. Understand, critically examine, and articulate key similarities and differences between their own cultural practices and perspectives and those of other cultures in the use of computing technology
7. Identify the importance and best practices of developing skills for working/interactively with others
8. Analyze the role that different languages, cultures, institutions, and beliefs have in shaping individual and collective behavior, particularly with regard to the use of technology
9. Understand and evaluate the causes of societal problems and potential solutions

MAJOR TOPICS

1. Computing for the public good
2. Public sources of data and use of data in computer models
3. Keeping data secure: authentication, malicious software (viruses, worms, and Trojan horses), phishing, network security, social engineering
4. Privacy: Internet tracking, cryptography, identity theft, data mining and the proliferation of personal data in corporate databases, rights and responsibilities of corporations and government, spam and email harvesters, spyware
5. Social media and online reputation
6. Computer mediated collaboration
7. Cultural issues in software: color and icons in user interfaces, representing text in languages other than English (Unicode), non-right-to-left languages (Hebrew, Arabic, Chinese, etc)
8. Cultural factors influencing views of Internet control and censorship
9. Understanding what a computer does; computability and the limits of computation
10. Artificial intelligence: capabilities, limits, and dangers

EVALUATION

2. Group project report and presentation:

Design an application or system to serve the public good	40%
--	-----
3. Quizzes:

	20%
--	-----
4. Tests (midterm and final exam):

	40%
--	-----

Tests will be open book; you may use course learning resources, defined by the instructor, and your class notes

15

Missouri State University Curricular Proposal Course Change or Deletion

Department Computer Science

Date 1/8/2013

Check one: This is a change to an existing COURSE
 an existing REGULAR (i.e. permanent) SECTION of a variable content course

Present Catalog Description (Cut and paste from web catalog or use most recent description.)	Revised Catalog Description (Cut and paste description again, strikethrough all deletions, and insert and bold new information.)
CSC 111 Introduction to Computing Prerequisite: eligible for MTH 261. General Education Course (Basic Required Courses). An introduction to computer hardware, software, and network resources relevant to the science major. Spreadsheets, word processing, databases, and computer-based mathematical software will be emphasized. 3(2-2) F,S	CSC 111 Introduction to Computing Prerequisite: eligible for MTH 261. General Education Course (Basic Required Courses) . An introduction to computer hardware, software, and network resources relevant to the science major. Spreadsheets, word processing, databases, and computer-based mathematical software will be emphasized. Students will write programs and create computational models to analyze data and make written and oral presentations describing conclusions drawn from their analyses. 3(2-2) 3(3-0) F,S

What is changing? Check all boxes that apply.

- Course Deletion
- Course Code
- Course Number
- Title
- Prerequisite
- Credit Hours/Contact Hours
- Periodicity
- Description

Reason for Proposed Change or Deletion

This course is currently a general education course. The changes are intended to meet the new requirements for Quantitative Literacy.

How Did You Determine the Need For This Change or Deletion?

Studied new general education structure and learning outcomes.

COMPLETE NEW CATALOG INFORMATION (typed)

CSC 111 Introduction to Computing
Prerequisite: eligible for MTH 261. An introduction to computer hardware, software, and network resources. Spreadsheets and computer-based mathematical software will be emphasized. Students will write programs and create computational models to analyze data and make written and oral presentations describing conclusions drawn from their analyses. 3(3-0) F, S

Check if this is a **non-substantive** change. Distribution for non-substantive changes of 100- through 500-level courses: two originally-signed copies to Faculty Senate; 600- through 900-level courses: three originally-signed copies to Graduate Council. Graduate Council will give two copies to Faculty Senate after approval.

Substantive Change: Department routes according to ART VI, SEC 3B(1-4) of Bylaws of the Faculty. Forward three originally signed forms to one of the following (please check all that apply and send to first council/committee marked). If proposal needs to go through more than one council/committee, forward one additional form for each additional council/committee marked. See Senate Action 11-93/94 for definitions of substantive/non-substantive changes.

- College Council** (All substantive course changes numbered 100-599 must go through College Council first. After approval, College Council will forward appropriate number of copies to the next committee/council or directly to the Faculty Senate if no further committee approval is needed. The last level of committee/council will forward two originally signed copies to the Faculty Senate.)
- Professional Education Committee** (Considers all substantive course changes for Professional Education courses and Teaching Methods courses.)
- Committee on General Education and Intercollegiate Programs** (Considers all substantive course changes for General Education and Intercollegiate Program proposals.)
- Graduate Council** (Considers all 600-900 level course changes.)

Signature Kenneth Holman
Department Head

Date 1/8/2013

CSC 111, Introduction to Computing

Instructor: Dr Lloyd Smith **Office:** CHEK 316 **Phone:** 836-4834 **Email:** lloydsmith@missouristate.edu

Class meeting times: TBA

Course Description: An introduction to computer hardware, software, and network resources. Spreadsheets and computer-based mathematical software will be emphasized. Students will write programs and create computational models to analyze data and make written and oral presentations describing conclusions drawn from their analyses. 3(3-0) F, S

Course Pre-requisites: Eligible for MTH 261

Required Texts: There is no standard text for this course. Course materials will include pointers to freely available resources on the web.

SPECIFIC STUDENT LEARNING OUTCOMES

Students will be able to

1. Interpret and communicate information presented in mathematical forms (e.g., equations, functions, graphs, diagrams, tables, or words).
2. Convert relevant information into various mathematical forms (e.g., equations, functions, graphs, diagrams, tables, or words).
3. Create spreadsheet models and computer programs to solve problems by calculating numerically and symbolically.
4. Analyze data quantitatively as the basis for competent, valid, and reliable inferences in order to draw reasonable and appropriate conclusions.
5. Express evidence in support of an argument by employing an appropriate form of presentation (e.g., equations, functions, graphs, diagrams, tables, or words).

MAJOR TOPICS

1. History of data analysis
2. Computer systems and networks
3. Sources of data
4. Introduction to programming
5. Computational tools for analyzing data: spreadsheets and programming languages
6. Creating and using computational models
7. Simulation: writing programs to carry out Monte Carlo simulation, etc
8. Machine learning: prediction, classification, and clustering
9. Visualizing data
10. Presenting results and conclusions

EVALUATION

- | | |
|------------------------------------|-----|
| 1. Reports and presentations: | 40% |
| 2. Quizzes: | 20% |
| 3. Tests (midterm and final exam): | 40% |

Tests will be open book; you may use course learning resources, defined by the instructor, and your class notes

Missouri State University
CURRICULAR PROPOSAL

NEW COURSE (or new REGULAR SECTION of an existing variable content course)

Department Mathematics

Date 01/03/13

Check one: New COURSE New REGULAR (i.e. permanent) SECTION of an existing variable content course. If a new regular section of an existing variable topics course, to what existing course is it to be attached? _____

PROPOSED CATALOG DESCRIPTION MTH 121 Multicultural Views of History and Mathematics

Description: This course focuses on developing an appreciation of the impact of mathematics in the development of society and the impact of historical events on the development of mathematics. Students in this course explore the impact of historical events like the geographical isolation of cultures, the Dark Ages, religious and societal intolerance, and the frailty of humankind on the development of mathematical knowledge and the cultural attitudes toward the study of mathematics today. Parallels will be drawn to events in today's world to determine how each individual can foster the global advancement of knowledge. The level of mathematical and historical knowledge expected of incoming students does not exceed the level of traditional high school courses.

PURPOSE OF COURSE

Students can take this course to meet the Focus on Cultural Competency portion of the Public Affairs requirement for General Education. This course is intended to meet Goal 13 and Goal 14 of the MSU General Education Learning Goals:

- General Goal (13): Students will be able to recognize and consider multiple perspectives and cultures.
- General Goal (14): Students will be able to articulate their value systems, understand the ethical implication of their actions based on those values, and develop skills consistent with having a positive impact on individuals, groups, or communities.

RELATIONSHIP TO OTHER DEPARTMENTS

This course could promote collaboration between the mathematics department and others, such as history and geography. Since it is a new course for the Public Affairs goal, it should have no negative impact on any currently offered course.

DEPARTMENT: Route according to ART VI, SEC 3B(1-4) of Bylaws of the Faculty. Attach New Course Resource Information form (FS 300a/05) and forward three typed, originally signed forms to one of the following (please check all that apply and send to first council/committee marked). If the course needs to go through more than one council/committee forward one additional form for each additional council/committee marked.

- College Council (All new course proposals numbered 100-599 must go through College Council first. After approval, College Council will forward appropriate number of copies to the next committee/ council or directly to the Faculty Senate if no further committee approval is needed.)
- Professional Education Committee (Considers all new courses affecting BS and MS in Education and Educational Specialist degrees)
- Committee on General Education and Intercollegiate Programs (Considers all general education and multi-college new course proposals)
- Graduate Council (Considers all 600-, 700-, and 800-level new courses)

*If the course needs to go through more than one council/committee, forward one additional form for each additional council/committee marked.

Signature [Handwritten Signature]
Department Head

Date 1/3/13

(Routing on Reverse Side)

FS New Course - 9/10/2010

MTH 121: Multicultural Views of History and Mathematics

Proposed Syllabus

Type of Course: General Education – Breadth of Knowledge: Public Affairs Focus on Cultural Competence

Prerequisite: None

Description: This course focuses on developing an appreciation of the impact of mathematics in the development of society and the impact of historical events on the development of mathematics. Students in this course explore the impact of historical events like the geographical isolation of cultures, the Dark Ages, religious and societal intolerance, and the frailty of humankind on the development of mathematical knowledge and the cultural attitudes toward the study of mathematics today. Parallels will be drawn to events in today's world to determine how each individual can foster the global advancement of knowledge. The level of mathematical and historical knowledge expected of incoming students does not exceed the level of traditional high school courses.

Philosophy: This course allows students to experience mathematics as an ongoing endeavor of humankind. History can show us how this development has been affected by geography, wars, religion, society's views on equity, and the perseverance of the human spirit.

Purpose of the Course: Students can take this course to meet the Focus on Cultural Competency portion of the Public Affairs requirement for General Education. This course is intended to meet Goal 13 and Goal 14 of the MSU General Education Learning Goals:

- General Goal (13): Students will be able to recognize and consider multiple perspectives and cultures.
- General Goal (14): Students will be able to articulate their value systems, understand the ethical implication of their actions based on those values, and develop skills consistent with having a positive impact on individuals, groups, or communities.

Learning Objectives: The following student learning objectives will serve as the core curriculum for this course. Students will also complete an independent project that may explore other related areas. See <http://www.missouristate.edu/GeneralEducation/genedrevised.htm> for the specific learning outcomes notated below.

1. Describe the main routes of development of mathematical knowledge in the ancient world and compare to the methods of dissemination of knowledge in today's world. (SLO 13.2, 13.4, 14.5)

2. Identify milestones in the development of mathematical knowledge. Determine contributing and impeding factors for those milestones. (SLO 13.2, 13.4, 14.3)
3. Identify key historical events that had an impact on the development of mathematical knowledge. Explain how the development was impacted and conjecture how the development might have been different. (SLO 13.2, 13.4, 14.5)
4. Recognize the achievements of the historically significant mathematicians of the past and present within the context of their culture – the hurdles they faced and the assets they enjoyed. (SLO 13.2, 13.4, 14.5)
5. Consider actions that today's societies can take to encourage individual self-actualization and the advancement of global knowledge. (SLO 13.3, 14.1, 14.4)

Pedagogical and Topical Aspects of the Course: This course should be presented in a variety of contexts. It can be a blended course with students accessing factual information outside of class, then discussing and analyzing contexts within class. Virtual tours can be made to explore locations and artifacts. Guest speakers from across campus can present on special topics. Assessment can include exams, papers, and presentations.

Topics can include:

1. contributions of major figures, such as: ancient Greek mathematicians, Archimedes, Gauss, and Newton
2. contents of important ancient texts, such as: Archimedes Palimpsest, Plimpton 322, or Rhind Papyrus
3. the fragility of an axiomatic system – or why we have to prove everything
4. development of the Hindu-Arabic numeral system
5. development of mathematics in separate cultures and how they coalesced into the mathematics of today
6. mathematics related to wars
7. the impact of religion on the development of mathematical knowledge
8. mathematics developed to measure the earth and stars
9. the effects of gender bias throughout the development of mathematical knowledge
10. famous theorems and problems throughout history, such as: Eratosthenes' approximation of the circumference of the earth, Euclid's Fifth Postulate, the Pythagorean Theorem, Fermat's Last Theorem.

Misc. Policies: The syllabus will also contain the standard required items as listed on the Provost's website.

NEW COURSE RESOURCE INFORMATIONDepartment MathematicsDate 11/29/12Course Number and Title MTH 121: Multicultural Views of History and MathematicsAnticipated Average Enrollment 60-100 students each spring semesterMaximum Enrollment Limit 44Faculty Load Assignment 3 Equated Hours

1 Is another course being deleted? If so, give course number and title.

No course is being deleted.

2 What will this course require in the way of:

Additional library holdings? Several titles may be requested to increase the holdings in history of mathematics for the layman.

Additional computer resources? None anticipated. Access to web-conferencing tool like Adobe Connect may be requested.

Additional or remodeled facilities? None.

Additional equipment or supplies? None.

Additional travel funds? None.

Additional faculty--general vs specialized? None.

Other additional expenses? None.

3 If additional faculty are not required, how will faculty be made available to teach this course?

This course will be offered in the spring semester, when the numbers are lower in gen ed courses.

List names of current faculty qualified to teach this course: All Mathematics Department faculty – ranked and instructors

4 What is the anticipated source of students for this course? (If from within the department, will students be taking this course in addition to or in place of other courses? If from outside the department, which courses in other departments would most likely be affected?)

This would be one option for students to meet the Gen Ed requirement for Public Affairs.

5 Other comments:

Missouri State University Curricular Proposal Program Change or Deletion

17

Department College of Natural and Applied Sciences **Date** January 8, 2013

Title of Program Affected _Master of Natural and Applied Sciences

Major Comprehensive Major ___ Option ___ Minor ___ Certificate ___ Certification ___ Academic Rules ___ Other ___

Present Catalog Description (Cut and paste from web catalog or use most recent description.)	Revised Catalog Description (Cut and paste description again, strikethrough all deletions, and insert and bold new information.)
See Attachment A	See Attachment B

What is changing? Check all boxes that apply.

- Title change
- Course changes of under 18 hours
- Course changes of 18 hours or more
- From option to program (major)
- From program (major) to option
- Program or option deletion
- Other

REASON FOR PROPOSED CHANGE

The changes are to clarify admission and degree requirements for the MNAS degree and add a statement concerning the availability of graduate assistantships.

COMPLETE NEW CATALOG INFORMATION (Typed)

See Attachment B

Total Hours 32

DEPARTMENT: Route according to ART VI, SEC 3B(1-4) of Bylaws of the Faculty Senate. Forward three typed, originally signed forms to one of the following (please check all that apply and send to first council/committee marked). If the program needs to go through more than one committee/council, forward one additional form for each additional council/ committee marked.

- College Council (Send all undergraduate program changes through College Council as first step before forwarding either to PEC, CGEIP, or directly to Faculty Senate)
- Professional Education Committee (Considers all program changes affecting BS and MS in Education and Educational Specialist degrees)
- Committee on General Education and Intercollegiate Programs (Considers all general education and multi-college program changes)
- Graduate Council (Considers all graduate-level program changes)

Signature _____
Department Head

Date _____

(Routing on Reverse Side)

**Master of Natural and Applied Science – Program Change
Present Catalog Description****Master of Natural and Applied Science (Interdisciplinary Program)**

Temple Hall, room 142, Phone: (417) 836-5249

Email: DanielBeckman@MissouriState.edu or XingpingSun@MissouriState.edu

Website: <http://www.cnas.missouristate.edu/mnas.htm>

Directors: **Daniel Beckman and Xingping Sun**

Program Description

The Master of Natural and Applied Science is designed to provide those working in an environment where scientific knowledge is a priority, such as science teaching and scientific applications, the opportunity to expand their knowledge and experiences consistent with their professional goals and objectives through an interdisciplinary program of study in the natural and applied sciences. The curriculum will consist of formal courses in one or more areas of concentration, professional advisement, graduate seminar or research options (e.g., master's thesis), as well as incorporating the candidate's background, goals, and objectives.

Program Objectives

1. To increase both the depth and breadth of knowledge in one or more of the areas in natural sciences for understanding and appreciation of the interdisciplinary nature of science.
2. To provide advanced training and education for expanding current scientific knowledge and capabilities.
3. To provide a base of knowledge or enhancement in an area of natural science outside an original field of study.

Admission Requirements

~~Students admitted in full standing must meet the following requirements.~~ **In order to be considered for admission students must meet the following requirements. These are minimum requirements; acceptance into the program is on a competitive basis.**

1. The student must have a bachelor's degree from a college or university accredited by agencies recognized by Missouri State University or equivalent education from a foreign university.
2. The student must have a GPA of 3.00 on a 4.00 scale for the last 60 hours of course work **required for the undergraduate degree, AND, OR** a score on the Graduate Record Examination (GRE) meeting or surpassing the minimum score prescribed by the MSU Graduate Catalog for admission to graduate study (<http://graduate.missouristate.edu/requirements.htm>). **Submission of GRE General Test scores may be required by some departments. The student should contact the department coordinator for the primary emphasis area to determine additional admission requirements.**
3. **The student must submit** ~~Submission of a Letter Statement~~ **of Interest and at least two Letters of Recommendation;** **submit these directly to the MNAS Program Director, or Darr School of Agriculture if Agriculture is the primary area of interest.**

- 17
4. International applicants are also required to submit a score of not less than 550 on the paper-based or a comparable score of 213 on the computer-based TOEFL, with a minimum of 50th percentile on the Listening Comprehension Section.
 5. The student must have an undergraduate background of at least 20 semester hours in the natural and applied sciences. **Students may be required to meet course prerequisites for their emphasis areas. Undergraduate courses will not be credited as course requirements for the master's degree.**

Graduate Assistantships

A limited number of teaching assistantships (TA) may be available, awarded on a competitive basis.

Applications (<http://graduate.missouristate.edu/assistantship.htm>) are to be submitted to the MNAS Program Director, or Darr School of Agriculture if Agriculture is the primary area of interest. Applicants should have all application materials submitted by March 1 (fall assistantships) or October 1 (spring assistantships) to ensure being considered for a TA position. GRE General Test scores may be considered in awarding assistantships.

Degree Requirements (minimum of 32 hours)

1. **Advisory Committee.** Initially, each student will be advised by the departmental coordinator of graduate studies from the student's primary emphasis area. As soon as possible, the student will select a graduate faculty member from that department to chair a graduate advisory committee consisting of at least three faculty members that includes a faculty member from the student's second area of concentration. This committee will supervise the remainder of the student's program. **Some departments may require that an advisory committee chair be identified prior to acceptance into the program; applicants should contact the department of the primary emphasis area.**
2. **Program of Study.** This unique interdisciplinary masters program requires more than one area of concentration. Each individualized program will be structured by the advisory committee in consultation with the student. The academic background, professional experience, academic objectives, and personal needs will be considered in establishing the individual's program.

Students may select areas of primary emphasis in the following six departments in the College of Natural and Applied Sciences: Biology; Chemistry; Computer Science; Geography, Geology and Planning; Mathematics; and Physics, Astronomy and Material Science; and in the Darr School of Agriculture. In special cases, a "primary emphasis" may be a science topic that is interdisciplinary in itself (for example, Environmental Science), and the relevant course work include more than one department; such a program of study must be approved by the student's Advisory Committee and program director. Students will select a second area of concentration from the above mentioned academic units or from the College of Business Administration (COBA). With approval of the Advisory Committee and program director, other possible outside areas may be pursued, such as education. This second area of concentration may also be inherently interdisciplinary as long as it is distinct from the primary area.

3. **Course Requirements.** The student must select a primary emphasis area consisting of at least 16 hours of courses selected from one department in the College of Natural and Applied Sciences listed above. The student must also select 9-16 hours of graduate courses outside the primary area approved by the student's advisory committee. In total, the student must complete at least 32 hours of course work, of which at least 16 must be in courses open only to graduate students (numbered 700 or above).

- 4. **Grade Point Average.** A GPA of at least 3.00 on a 4.00 scale for all graduate work at Missouri State and course work transferred from other institutions is required.
- 5. **Research Requirements.** A student will be required to complete one of the following research requirements.

Thesis Option: The Thesis option requires the completion of a research thesis supervised by the student's advisory committee. The thesis shall be approved by the advisory committee and by the Dean of the Graduate College before the degree is granted. A maximum of six hours of thesis credit can be applied toward the minimum hours required for the master's degree.

Non-Thesis Option: The Non-Thesis option requires the completion of a minimum of one semester course which shall require an extensive research paper or creative work. The student's advisory committee must approve the final research paper and complete a Seminar Report form that is submitted to the academic department chosen as the major area of concentration and subsequently to the Graduate College for the approval of the Dean.

Internship Option: The Internship option requires the completion of internship with a discipline-related business, non-profit organization, or government agency (480 hours). This must include an extensive project that is approved and supervised by the student's on-site mentor and the departmental advisory committee. A maximum of six hours of Internship credit can be applied toward the 32 hours required for this degree.

- 6. **Comprehensive Examination.** After **most of** the course work has been completed, and upon approval of the advisory committee, a written comprehensive examination will be administered and evaluated by the advisory committee. This examination must be passed by the candidate before a degree will be given.
- 7. **Time Limit.** The student must complete all requirements within an eight-year period (exclusive of the time spent in the United States Armed Forces).

The Professional Science Master Designation

A student who selects business as the second area of concentration and completes the internship option of the research requirements will receive the Professional Science Master (PSM) designation. The PSM program is recognized by the national Council of Graduate Schools.

Accelerated Master's Degree Option

Eligible Missouri State University students in a major in the College of Natural and Applied Sciences may apply for preliminary acceptance into the Master of Natural and Applied Science program after admission requirements for the accelerated master's option have been satisfied. If accepted, graduate courses chosen from approved 600-level courses or higher may be counted toward both the graduate and undergraduate degrees, with a maximum of 12 credit hours. This option offers an opportunity for CNAS majors whose goals, academic capabilities, and career planning include graduate work, to complete the requirements for the master's degree in less time than would otherwise be possible. Contact the MNAS Program Director for further information and guidelines.

All requirements for the implemented undergraduate program should be met for graduation from the undergraduate degree program. A student may fully be admitted to the Graduate College upon completion of the requirements for the baccalaureate degree. All requirements for the implemented master's program should be met for graduation from the master's degree program.

A student must be admitted into the Accelerated Master's Degree Program at Missouri State University in order to begin taking graduate course work for dual credit. Admission requires approval from the Graduate Program Advisor, Department Head of the undergraduate program, and the Dean of the Graduate College. Students admitted into the Accelerated Master's Degree program will not be fully admitted into the Graduate College until completion of their undergraduate degree and fulfillment of all other requirements for admission to the Graduate College (such as the Graduate Record Examination). Student should be awarded the bachelor's degree upon completion of the minimum of 125 hours of combined graduate and undergraduate course work and degree specific requirements.

Admission Requirements for the Accelerated Master's Option

1. Junior standing and a GPA 3.25 or better.
2. ~~A GRE score of at least 1000 on the verbal plus quantitative section.~~
3. A supportive recommendation from the student's undergraduate advisor.
4. Acceptance of applicant by a graduate faculty member who agrees to serve as the student's graduate mentor.

**Master of Natural and Applied Science – Program Change
Complete New Catalog Information****Master of Natural and Applied Science (Interdisciplinary Program)**

Temple Hall, room 142, Phone: (417) 836-5249

Email: DanielBeckman@MissouriState.edu or XingpingSun@MissouriState.edu

Website: <http://www.cnas.missouristate.edu/mnas.htm>

Directors: Daniel Beckman and Xingping Sun

Program Description

The Master of Natural and Applied Science is designed to provide those working in an environment where scientific knowledge is a priority, such as science teaching and scientific applications, the opportunity to expand their knowledge and experiences consistent with their professional goals and objectives through an interdisciplinary program of study in the natural and applied sciences. The curriculum will consist of formal courses in one or more areas of concentration, professional advisement, graduate seminar or research options (e.g., master's thesis), as well as incorporating the candidate's background, goals, and objectives.

Program Objectives

1. To increase both the depth and breadth of knowledge in one or more of the areas in natural sciences for understanding and appreciation of the interdisciplinary nature of science.
2. To provide advanced training and education for expanding current scientific knowledge and capabilities.
3. To provide a base of knowledge or enhancement in an area of natural science outside an original field of study.

Admission Requirements

In order to be considered for admission students must meet the following requirements. These are minimum requirements; acceptance into the program is on a competitive basis.

1. The student must have a bachelor's degree from a college or university accredited by agencies recognized by Missouri State University or equivalent education from a foreign university.
2. The student must have a GPA of 3.00 on a 4.00 scale for the last 60 hours of course work required for the undergraduate degree, OR a score on the Graduate Record Examination (GRE) meeting or surpassing the minimum score prescribed by the MSU Graduate Catalog for admission to graduate study (<http://graduate.missouristate.edu/requirements.htm>). Submission of GRE General Test scores may be required by some departments. The student should contact the department coordinator for the primary emphasis area to determine additional admission requirements.
3. The student must submit a Statement of Interest and at least two Letters of Recommendation; submit these directly to the MNAS Program Director, or Darr School of Agriculture if Agriculture is the primary area of interest.

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4. International applicants are also required to submit a score of not less than 550 on the paper-based or a comparable score of 213 on the computer-based TOEFL, with a minimum of 50th percentile on the Listening Comprehension Section.
5. The student must have an undergraduate background of at least 20 semester hours in the natural and applied sciences. Students may be required to meet course prerequisites for their emphasis areas. Undergraduate courses will not be credited as course requirements for the master's degree.

Graduate Assistantships

A limited number of teaching assistantships (TA) may be available, awarded on a competitive basis. Applications (<http://graduate.missouristate.edu/assistantship.htm>) are to be submitted to the MNAS Program Director, or Darr School of Agriculture if Agriculture is the primary area of interest. Applicants should have all application materials submitted by March 1 (fall assistantships) or October 1 (spring assistantships) to ensure being considered for a TA position. GRE General Test scores may be considered in awarding assistantships.

Degree Requirements (minimum of 32 hours)

1. **Advisory Committee.** Initially, each student will be advised by the departmental coordinator of graduate studies from the student's primary emphasis area. As soon as possible, the student will select a graduate faculty member from that department to chair a graduate advisory committee consisting of at least three faculty members that includes a faculty member from the student's second area of concentration. This committee will supervise the remainder of the student's program. Some departments may require that an advisory committee chair be identified prior to acceptance into the program; applicants should contact the department of the primary emphasis area.
2. **Program of Study.** This unique interdisciplinary master's program requires more than one area of concentration. Each individualized program will be structured by the advisory committee in consultation with the student. The academic background, professional experience, academic objectives, and personal needs will be considered in establishing the individual's program.

Students may select areas of primary emphasis in the following six departments in the College of Natural and Applied Sciences: Biology; Chemistry; Computer Science; Geography, Geology and Planning; Mathematics; and Physics, Astronomy and Material Science; and in the Darr School of Agriculture. In special cases, a "primary emphasis" may be a science topic that is interdisciplinary in itself (for example, Environmental Science), and the relevant course work include more than one department; such a program of study must be approved by the student's Advisory Committee and program director. Students will select a second area of concentration from the above mentioned academic units or from the College of Business (COB). With approval of the Advisory Committee and program director, other possible outside areas may be pursued, such as education. This second area of concentration may also be inherently interdisciplinary as long as it is distinct from the primary area.

3. **Course Requirements.** The student must select a primary emphasis area consisting of at least 16 hours of courses selected from one department in the College of Natural and Applied Sciences listed above. The student must also select 9-16 hours of graduate courses outside the primary area approved by the student's advisory committee. In total, the student must complete at least 32 hours of course work, of which at least 16 must be in courses open only to graduate students (numbered 700 or above).
4. **Grade Point Average.** A GPA of at least 3.00 on a 4.00 scale for all graduate work at Missouri State and course work transferred from other institutions is required.

- 5. **Research Requirements.** A student will be required to complete one of the following research requirements.

Thesis Option: The Thesis option requires the completion of a research thesis supervised by the student's advisory committee. The thesis shall be approved by the advisory committee and by the Dean of the Graduate College before the degree is granted. A maximum of six hours of thesis credit can be applied toward the minimum hours required for the master's degree.

Non-Thesis Option: The Non-Thesis option requires the completion of a minimum of one semester course which shall require an extensive research paper or creative work. The student's advisory committee must approve the final research paper and complete a Seminar Report form that is submitted to the academic department chosen as the major area of concentration and subsequently to the Graduate College for the approval of the Dean.

Internship Option: The Internship option requires the completion of internship with a discipline-related business, non-profit organization, or government agency (480 hours). This must include an extensive project that is approved and supervised by the student's on-site mentor and the departmental advisory committee. A maximum of six hours of Internship credit can be applied toward the 32 hours required for this degree.

- 6. **Comprehensive Examination.** After most of the course work has been completed, and upon approval of the advisory committee, a written comprehensive examination will be administered and evaluated by the advisory committee. This examination must be passed by the candidate before a degree will be given.
- 7. **Time Limit.** The student must complete all requirements within an eight-year period (exclusive of the time spent in the United States Armed Forces).

The Professional Science Master Designation

A student who selects business as the second area of concentration and completes the internship option of the research requirements will receive the Professional Science Master (PSM) designation. The PSM program is recognized by the national Council of Graduate Schools.

Accelerated Master's Degree Option

Eligible Missouri State University students in a major in the College of Natural and Applied Sciences may apply for preliminary acceptance into the Master of Natural and Applied Science program after admission requirements for the accelerated master's option have been satisfied. If accepted, graduate courses chosen from approved 600-level courses or higher may be counted toward both the graduate and undergraduate degrees, with a maximum of 12 credit hours. This option offers an opportunity for CNAS majors whose goals, academic capabilities, and career planning include graduate work, to complete the requirements for the master's degree in less time than would otherwise be possible. Contact the MNAS Program Director for further information and guidelines.

All requirements for the implemented undergraduate program should be met for graduation from the undergraduate degree program. A student may fully be admitted to the Graduate College upon completion of the requirements for the baccalaureate degree. All requirements for the implemented master's program should be met for graduation from the master's degree program.

A student must be admitted into the Accelerated Master's Degree Program at Missouri State University in order to begin taking graduate course work for dual credit. Admission requires approval from the Graduate Program Advisor, Department Head of the undergraduate program, and the Dean of the Graduate College. Students admitted into the Accelerated Master's Degree program will not be fully admitted into the Graduate College until completion of their

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undergraduate degree and fulfillment of all other requirements for admission to the Graduate College (such as the Graduate Record Examination). Student should be awarded the bachelor's degree upon completion of the minimum of 125 hours of combined graduate and undergraduate course work and degree specific requirements.

Admission Requirements for the Accelerated Master's Option

1. Junior standing and a GPA 3.25 or better.
2. A supportive recommendation from the student's undergraduate advisor.
3. Acceptance of applicant by a graduate faculty member who agrees to serve as the student's graduate mentor.

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Missouri State University
CURRICULAR PROPOSAL
NEW COURSE (or new REGULAR SECTION of an existing variable content course)

Department CHM

Date XX 11/29/12

Check one: New COURSE New REGULAR (i.e. permanent) SECTION of an existing variable content course. If a new regular section of an existing variable topics course, to what existing course is it to be attached? _____

PROPOSED CATALOG DESCRIPTION

CHM 108 Chemistry for the Citizen Laboratory

Prerequisite: "C-" grade or better in CHM107 or concurrent enrollment. General Education Course (Natural World). A one semester course for the non-science major. Principal concepts and applications of chemistry are presented. Emphasis on experiments and lab skills associated with the lecture material in CHM107. Supplemental course fee. 1(0-2) F,S

PURPOSE OF COURSE

CHM107 currently has a lecture and lab associated with the course. This change proposes to split the course to have a course which is lecture only (CHM107) and a course that is the associated lab (CHM108). This will alleviate problems with student registration and advising associated with transfer credits from institutions where these courses were separate.

There have been a large numbering of transfer credit problems associated with these courses. This will also allow for separation of grades in the performance of these courses. The Registrar's office suggested structuring these proposed changes in this fashion to alleviate as many registration problems as possible.

Also, as a planned General Education offering, the separate lab and lecture courses will allow students to satisfy General Goal 11 of the new Gen Ed program (*Knowledge of the Natural World/Physical Sciences*) as either a lab or non-lab experience by taking CHM 107 with or without CHM 108.

RELATIONSHIP TO OTHER DEPARTMENTS

DEPARTMENT: Route according to ART VI, SEC 3B(1-4) of Bylaws of the Faculty. Attach New Course Resource Information form (FS 300a/05) and forward three typed, originally signed forms to one of the following (please check all that apply and send to first council/committee marked). If the course needs to go through more than one council/committee forward one additional form for each additional council/committee marked.

- College Council (All new course proposals numbered 100-599 must go through College Council first. After approval, College Council will forward appropriate number of copies to the next committee/ council or directly to the Faculty Senate if no further committee approval is needed.)
- Professional Education Committee (Considers all new courses affecting BS and MS in Education and Educational Specialist degrees)
- Committee on General Education and Intercollegiate Programs (Considers all general education and multi-college new course proposals)
- Graduate Council (Considers all 600-, 700-, and 800-level new courses)

*If the course needs to go through more than one council/committee, forward one additional form for each additional council/committee marked.

Signature [Signature]
Department Head

Date 11/29/12

(Routing on Reverse Side)

FS New Course - 9/10/2010

**Proposed Syllabus
Chemistry 108 – Lab Policy Statement/Syllabus
Fall 20XX**

Lab Section: _____ Lab Supervisor: _____

Office: _____ Office Hours: _____

Phone number: _____ Email: _____

REQUIRED ITEMS:

1. A scientific **calculator**.
2. A pair of ANSI Z-89 approved **safety goggles** and a **pair of shoes that cover the entire foot** (closed-toed and closed-heeled). **YOU WILL NOT BE ALLOWED TO WORK IN THE LAB WITHOUT WEARING APPROVED GOGGLES AND APPROVED SHOES!!!!!!** New goggles may be purchased from the bookstore, or used goggles may be purchased from the ACS student group (TEM 403). If you forget your goggles or wear improper footwear, you may borrow goggles or purchase booties for \$3.00.
3. You will be required to participate in the **Blackboard website** (CHM108-001-Fa12) for this course. Quizzes, journals, and lab reports will be submitted electronically through this website.

CHM 108 General Education Goals:

CHM 108 satisfies the "Understanding the Natural World" (with lab) component of Missouri State University's general education requirements. The full set of General Education goals can be found on the MSU website at http://www.missouristate.edu/GeneralEducation/Faculty_Senate_Approved_GenEd.htm. The content of CHM 108 specifically addresses the following general education goals:

Part One: Intellectual Abilities and Dispositions

B. Information-Gathering, Reasoning, and Synthesizing Abilities

1. Skill in formulating questions and in setting goals for inquiry
 - Students will formulate questions based on experimental data and test their hypothesis.
2. Knowing how and when to make generalizations and value judgments
 - Students will develop a mastery of critical thinking skills, problem-solving skills, and data analysis skills.
3. Skill in generating and evaluating observations and evidence
 - Students will evaluate data and observations from laboratory exercises.
4. Skill in making deductive inferences
 - Students will develop a mastery of critical thinking skills, problem-solving skills, and data analysis skills.
 - Student will use the scientific method for measurements and fundamental scientific computations.
5. Ability to use relevant quantitative methods
 - Students will be able to relate the observable behavior of matter and living systems to scientific models of the structure of matter on both the atomic and molecular scale.
 - Students will learn appropriate use of key measurement techniques used in a chemistry laboratory.

Part Two: Knowledge and Understanding

A. Understanding of the Natural World

1. Knowledge of the physical universe, including its origin and the physical laws governing it
Students will
 - learn the currently accepted models for the structure of matter from atomic to molecular scale.
 - carry out simple computations based on a variety of chemical principles and laws.
 - develop an understanding of energy changes associated with chemical reactions.
 - be able to describe the physical states of matter, the physical forces responsible for phase changes, and the behavior of mixtures.
 - gain an understanding of chemical bonding and chemical reactivity.

B. Understanding of Culture and Society

4. Understanding the ways human choices affect communities, from local to global, and responsibilities of individuals to assume the duties of citizenship
Students will be familiar with
 - the chemical processes responsible for the greenhouse effect and global warming.

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- chemical reactions responsible for the depletion of the ozone layer.
 - alternative sources of energy.
 - the role of chemistry in nutrition.
 - chemical reactions responsible for acid rain and its effects on the environment.

ATTENDANCE:

Attendance of lab classes is required. CHM 108 satisfies the laboratory requirement of the "Understanding the Natural World" component of Missouri State University's general education requirements. The full set of General Education goals can be found at [http://www.missouristate.edu/GeneralEducation/Faculty Senate Approved GenEd.htm](http://www.missouristate.edu/GeneralEducation/Faculty%20Senate%20Approved%20GenEd.htm). Laboratory experience is an essential part of this course. Therefore, completion of lab activities is mandatory. You will receive a score of zero for all labs that you do not complete. However, you will be allowed to drop your ONE lowest lab score so this may be used to drop the points missed for an absence as explained in the laboratory grading policy below. If you must miss more than one lab due to an **officially sanctioned** University activity, you can arrange to make up that lab by presenting a written excuse to your lab instructor **at least one week in advance** of your absence so that the necessary arrangements can be made. **Any student missing MORE THAN THREE labs for any reason is required to drop the course prior to the drop deadline (November 9) or receive a failing grade for the entire CHM108 course.**

SAFETY:

Approved safety goggles must be worn at all times in the laboratory. Be sure to know where emergency exits, fire extinguishers, safety showers and eyewash stations are located. A lab safety video and Materials Safety Data Sheets are available and will be discussed as part of the lab. All students are required to sign a Lab Safety Contract, acknowledging that they have read and agree to abide by the safety rules.

LAB GRADE:

The laboratory component of Chemistry 108 consists of 11 graded activities/experiments and 2 laboratory exams. Laboratory reports will be completed and handed in for each experiment. Journal entries and pre- or post-lab quizzes will be required for some experiments and will count as part of the lab grade (10 points out of 50). Quizzes will be given using Blackboard and may be required to be successfully completed by an assigned due date. Lab exams will cover all material that should be completed prior to the exam - that is, the midterm will cover the first 6 experiments, and the final exam will cover all 11 experiments. The exams will be a combination of written and practical (hands-on) portions.

Missed labs/dropped grades: If all 11 experiments are performed and the reports turned in, the lowest report grade will be dropped. The grades for the exams cannot be dropped. You will be given a grade of 0 (zero) for any missed lab (NOTE: one zero grade for a missed lab may be dropped as the lowest report grade...any additional zero grades will be counted). Your total points for lab will be determined as follows:

Experiment reports, journals and quizzes (10 experiments x 50 points each)	=	500 points
Midterm Exam	=	100 points
Final Exam	=	<u>200 points</u>
		800 points

PREPARATIONS:

It is your responsibility to read the correct laboratory experiments and all supplementary material before beginning the experiment. Refer to the laboratory schedule to determine which lab should be performed by a given date. At the discretion of your laboratory instructor, you may be denied the opportunity to perform the laboratory experiments if you have are not prepared. Each experiment will not only be more meaningful and more understandable but easier to run if you read through the experiment before coming to lab. If you need clarification of a procedure or explanation, please see your laboratory instructor during his or her office hours.

LAB REPORTS:

Laboratory reports will vary from experiment to experiment. The structure will be provided to you for each lab. The report will usually consist of a summary, data sheet and your responses to questions about the experiment. These laboratory reports **MUST** be turned in and pooled class data recorded on Blackboard during your lab class period. Although you may be asked to submit or analyze data as a group (the assignment will specify this), each student must complete all portions of the lab individually—work must be original (do NOT copy a classmate's work).

Points will be deducted if:

- 1. All work is not shown on calculations,
- 2. The lab report you turn in is not legible,
- 3. You do not perform all assigned parts of the experiment,
- 5. Proper safety procedures are not followed, or
- 6. The open-lab work area is left messy or dirty.

Additional points may be deducted for:

- 1. Percent error in results,
- 2. Incorrect or missing units,
- 3. Improper calculations, or
- 4. Incorrect significant digits.

NOTE: this is not an all-inclusive list of point deductions. It is recommended that you keep all of your lab reports until the end of the semester to study for the exams and as proof of your grade.)

Nondiscrimination Policy: Missouri State University is an equal opportunity/affirmative action institution, and maintains a grievance procedure available to any person who believes he or she has been discriminated against. At all times, it is your right to address inquiries or concerns about possible discrimination to the Office for Equity and Diversity, Park Central Office Building, 117 Park Central Square, Suite 111, (417) 836-4252. Other types of concerns (i.e., concerns of an academic nature) should be discussed directly with your instructor and can also be brought to the attention of your instructor's Department Head. Please visit the OED website at www.missouristate.edu/equity/.

Disability Accommodation Policy: To request academic accommodations for a disability, contact the Director of the Disability Resource Center, Plaster Student Union, Suite 405, (417) 836-4192 or (417) 836-6792 (TTY), www.missouristate.edu/disability. Students are required to provide documentation of disability to the Disability Resource Center prior to receiving accommodations. The Disability Resource Center refers some types of accommodation requests to the Learning Diagnostic Clinic, which also provides diagnostic testing for learning and psychological disabilities. For information about testing, contact the Director of the Learning Diagnostic Clinic, (417) 836-4787, <http://psychology.missouristate.edu/lcdc>.

Academic Dishonesty Policy: Missouri State University is a community of scholars committed to developing educated persons who accept the responsibility to practice personal and academic integrity. You are responsible for knowing and following the university's Student Academic Integrity Policies and Procedures, available at www.missouristate.edu/policy/academicintegritystudents.htm. You are also responsible for understanding and following any additional academic integrity policies specific to this class (as outlined by the instructor). Any student participating in any form of academic dishonesty will be subject to sanctions as described in this policy. If you are accused of violating this policy and are in the appeals process, you should continue participating in the class.

Dropping a Class: It is your responsibility to understand the University's procedure for dropping a class. If you stop attending this class but do not follow proper procedure for dropping the class, you will receive a failing grade and will also be financially obligated to pay for the class. For information about dropping a class or withdrawing from the university, contact the Office of the Registrar at 836-5520.

Cell Phone Policy: As a member of the learning community, each student has a responsibility to other students who are members of the community. When cell phones or pagers ring and students respond in class or leave class to respond, it disrupts the class. Therefore, the Office of the Provost prohibits the use by students of cell phones, pagers, PDAs, or similar communication devices during scheduled classes. All such devices must be turned off or put in a silent (vibrate) mode and ordinarily should not be taken out during class. Given the fact that these same communication devices are an integral part of the University's emergency notification system, an exception to this policy would occur when numerous devices activate simultaneously. When this occurs, students may consult their devices to determine if a university emergency exists. If that is not the case, the devices should be immediately returned to silent mode and put away. Other exceptions to this policy may be granted at the discretion of the instructor.

Emergency Response/Evacuation: Students who require assistance during an emergency evacuation must discuss their needs with their professors and Disability Services. If you have emergency medical information to share with me, or if you need special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible.

For additional information students should contact the Disability Resource Center, 836-4192 (PSU 405), or Larry Combs, Interim Assistant Director of Public Safety and Transportation at 836-6576.

For further information on Missouri State University's Emergency Response Plan, please refer to the following web site: <http://www.missouristate.edu/safetran/erp.htm>

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Lab Schedule – Fall 2012

Wednesday	CHM108 Lab Activity
22-Aug-12	Lab 0 - Introduction to Lab
29-Aug-12	Lab 1 - Chromatography of Food Dyes
5-Sep-12	Lab 2 - Lab Techniques and Measurement
12-Sep-12	Lab 3 - Visible Spectra, Light and Color
19-Sep-12	Lab 4 - Effectiveness of Sunscreens
26-Sep-12	Lab 5 - The Mole Concept
3-Oct-12	Lab 6 - Energy Comparison of Fuels/Food
10-Oct-12	Midterm Exam
17-Oct-12	Make-up week* - OPEN LAB
24-Oct-12	Lab 7 - Hardness of Water
31-Oct-12	Lab 8 - Water and Buffers
7-Nov-12	Lab 9 - pH of Common Materials
14-Nov-12	Lab 10 - Plastics & Recycling
21-Nov-12	Thanksgiving Holiday - NO LAB
28-Nov-12	Lab 11 - DNA
5-Dec-12	Lab Final Exam

*Details to be determined by instructor

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Missouri State University
CURRICULAR PROPOSAL

NEW COURSE (or new REGULAR SECTION of an existing variable content course)

Department CHM

Date XX 11/29/12

Check one: New COURSE New REGULAR (i.e. permanent) SECTION of an existing variable content course. If a new regular section of an existing variable topics course, to what existing course is it to be attached? _____

PROPOSED CATALOG DESCRIPTION

CHM 117 Fundamentals of Chemistry Laboratory

Prerequisite: "C-" grade or better in CHM116 or concurrent enrollment. Concurrent enrollment in MTH102 or 103 or eligibility for a higher math course. General Education Course (Natural World). Emphasis on experiments and lab skills associated with the lecture material in CHM116, such as chemical fundamentals and applications. Recommended for students needing only one semester of general chemistry. (CHM 117 will not count toward a chemistry major or minor.) May not be taken Pass/Not Pass. Supplemental course fee. 1(0-2) F,S

PURPOSE OF COURSE

The courses CHM105 (lecture and lab) and 106 (lecture only) are being altered to have a single course which is lecture only (CHM116) and a single course that is the associated lab (CHM117). CHM105 is then being deleted. This will alleviate problems with student registration and advising associated with transfer credits from institutions where these courses were separate. The numbering is now higher than the proposed CHM107/109 courses (previously CHM107) as CHM116 and 117 are more advanced in material. This is now consistent with the rest of the course numberings in the department.

There have been a large numbering of transfer credit problems associated with these courses. This will also allow for separation of grades in the performance of these courses. The Registrar's office suggested structuring these proposed changes in this fashion to alleviate as many registration problems as possible.

Also, as a planned General Education offering, the separate lab and lecture courses will allow students to satisfy General Goal 11 of the new Gen Ed program (*Knowledge of the Natural World/Physical Sciences*) as either a lab or non-lab experience by taking CHM 116 with or without CHM 117.

RELATIONSHIP TO OTHER DEPARTMENTS

DEPARTMENT: Route according to ART VI, SEC 3B(1-4) of Bylaws of the Faculty. Attach New Course Resource information form (FS 300a/05) and forward three typed, originally signed forms to one of the following (please check all that apply and send to first council/committee marked). If the course needs to go through more than one council/committee forward one additional form for each additional council/committee marked.

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- Professional Education Committee (Considers all new courses affecting BS and MS in Education and Educational Specialist degrees)
- Committee on General Education and Intercollegiate Programs (Considers all general education and multi-college new course proposals)
- Graduate Council (Considers all 600-, 700-, and 800-level new courses)

*If the course needs to go through more than one council/committee, forward one additional form for each additional council/committee marked.

Signature [Signature]
Department Head

Date 11/29/12

(Routing on Reverse Side)

FS New Course - 9/10/2010

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Proposed syllabus for new course, CHM117

Lab Syllabus

Fall 20XX

Lab Section: _____ Lab Instructor: _____

Office: _____ Office Hours: _____

Phone number: _____ Email: _____

Required Items:

1. You are required to participate in the **Blackboard** website for this course. Your scores will be recorded and reported through this website. In addition, lab procedures, descriptions, forms, and quizzes will all be assigned and managed through this website.
2. **Laboratory manual** – There will not be a required lab manual to purchase for this course. However, you will be required to print lab report forms and other supporting material from the Blackboard website for this course and bring them to lab each week.
3. Spiral or other **notebook and pencil**.
4. A **scientific calculator** – bring this with you to each scheduled laboratory and exam. Cell phones are not acceptable.
5. A pair of ANSI Z-89 approved **safety goggles** and a **pair of shoes that cover the entire foot (closed-toed and closed-heeled)** – bring these with you to each scheduled laboratory. **YOU WILL NOT BE ALLOWED TO WORK IN THE LAB WITHOUT APPROVED GOGGLES OR APPROVED SHOES!!!!!!**

CHM 117 General Education Goals:

CHM 117 satisfies the laboratory requirement of the "Understanding the Natural World" component of Missouri State University's general education requirements. CHM 116 is the lecture associated with CHM 117. The full set of General Education goals can be found at http://www.missouristate.edu/GeneralEducation/Faculty_Senate_Approved_GenEd.htm. The lecture content of CHM 116 specifically addresses the following general education goals:

Part One: Intellectual Abilities and Dispositions

B. Information-Gathering, Reasoning, and Synthesizing Abilities

1. Skill in formulating questions and in setting goals for inquiry

- Students will learn to set goals for solving computational and qualitative questions.

2. Knowing how and when to make generalizations and value judgments

- Students will learn to recognize the value and limitation of generalizing and will be able to assess ambiguities resulting from generalizations.

3. Skill in generating and evaluating observations and evidence

Students will learn

- to analyze data.
- to assess the relative validity of several possible solutions to a problem.

4. Skill in making deductive inferences

- Students will learn to apply fundamental chemical principals to explain data.

5. Ability to use relevant quantitative methods

Students will learn

- to carry out a variety of chemical computations.
- to choose between related computational methods and complete computations.

Part Two: Knowledge and Understanding

A. Understanding of the Natural World

1. Knowledge of the physical universe, including its origin and the physical laws governing it

Students will

- gain an appreciation for the laws governing the physical world.
- be able to relate the observable behavior of matter and living systems to scientific models of the structure of matter on both the atomic and molecular scale.
- understand chemical bonding and chemical reactivity.
- recognize key types of chemical reactions.
- develop an understanding of energy changes associated with chemical reactions.
- be able to describe the physical states of matter and the physical forces responsible for changes in the physical states of matter.

- understand solution properties and concentrations.
- 3. *Understanding of the history and methods of scientific inquiry and alternative explanations of the natural world*
- Students will understand how physical laws were discovered and developed.
- 5. *Understanding the ways human choices affect the earth and living systems and the responsibilities of individual citizens and communities to preserve global resources*

Students will be familiar with

- the chemical processes responsible for the greenhouse effect and global warming.
- chemical reactions responsible for the depletion of the ozone layer.
- alternative sources of energy.
- chemical reactions responsible for acid rain and its effects on the environment.

CHM 117 Lab General Education Goals:

CHM 117 satisfies the laboratory requirement of the "Understanding the Natural World" component of Missouri State University's general education requirements. The full set of General Education goals can be found at [http://www.missouristate.edu/GeneralEducation/Faculty Senate Approved GenEd.htm](http://www.missouristate.edu/GeneralEducation/Faculty_Senate_Approved_GenEd.htm). The laboratory content of CHM 117 specifically addresses the following general education goals:

Part One: Intellectual Abilities and Dispositions

B. Information-Gathering, Reasoning, and Synthesizing Abilities

1. *Skill in formulating questions and in setting goals for inquiry*
 - Students will learn to set goals for solving computational and qualitative questions.
2. *Knowing how and when to make generalizations and value judgments*
 - Students will learn to recognize the value and limitation of generalizing and will be able to assess ambiguities resulting from generalizations.
3. *Skill in generating and evaluating observations and evidence*
 - Students will be able to interpret and generate visual information.
 - Students will be able to observe and make measurements of physical changes.
4. *Skill in making deductive inferences*
 - Students will learn to apply fundamental chemical principals to explain data.
5. *Ability to use relevant quantitative methods*
 - Students will learn to perform accurate quantitative measurements using contemporary scientific instrumentation.
 - Students will learn appropriate use of key measurement techniques used in a chemistry laboratory.

D. Communication Skills

3. *Making use of computers and other technological tools*
 - Students will develop computer skills which will extend to other areas of science.

Attendance: Attendance at lab is required. CHM 117 satisfies the laboratory requirement of the "Understanding the Natural World" component of Missouri State University's general education requirements. The full set of General Education goals can be found at [http://www.missouristate.edu/GeneralEducation/Faculty Senate Approved GenEd.htm](http://www.missouristate.edu/GeneralEducation/Faculty_Senate_Approved_GenEd.htm). Laboratory experience is an essential part of this course. Therefore, attendance and completion of lab reports is mandatory. You will receive a score of zero for all labs that you do not attend. However, you will be allowed to drop your ONE lowest lab score so this may be used to drop the points missed for an absence as explained in the laboratory grading policy below. If you must miss more than one lab due to an **officially sanctioned** University activity, you can arrange to make up that lab with another regularly scheduled Chemistry 117 lab section by presenting an excuse to your lab instructor **at least one week in advance** of your absence so that the necessary arrangements can be made. **Any student missing MORE THAN THREE labs for any reason is required to drop the course prior to the drop deadline (November 9) or receive a failing grade for the entire CHM117 course.**

Laboratory grading: Twelve experiments/lab activities will be conducted. Related assignments to turn in may include pre-lab questions from Blackboard, class notes, pre-lab or post-lab quizzes, and laboratory reports. The best 11 experiments will be counted toward your lab score. Each lab report (with appropriate pre-lab questions or activities) will be graded on a 25-point basis (275 total points possible) and pre-lab or post-lab quizzes will be worth 5 points (for a total of 55 points). Some scores will be based on individual assignments, and some may

be based on group assignments. You will be allowed to drop your ONE lowest lab and ONE lowest quiz score. If you miss an experiment or quiz, it will be graded as a zero and used as your lowest score, which subsequently will be dropped. If you miss more than one experiment or quiz, each additional absence will also count as a zero, which cannot be dropped. Two 200-point laboratory exams will be given during the semester. Your lab exams will be comprehensive and include all material covered up to that point in the semester. Exams will be partially written and partially practical in nature. That is, you will be required to perform parts of actual lab activities and collect and interpret data.

A summary of the points available in lab follows:

Pre-or post-lab quizzes (total of 12, but lowest is dropped)	(11 x 5 pts)	55 points
Lab Reports (total of 12, but lowest is dropped)	(11 x 25 pts)	275 points
<u>Exams (Mid-term and Final)</u>	<u>(2 x 200 points)</u>	<u>400 points</u>
	Total Points	730 points

Laboratory reports will come from materials that are provided to you either in class or on the Blackboard website. These laboratory reports **MUST** be handed in at the end of the laboratory or at a time designated by your lab instructor. All work must be shown on calculations to receive credit. Unreadable reports or parts of reports will receive no credit. Additional points may be deducted for percent error in results, incorrect or missing units, improper calculations, incorrect significant digits, messy lab area, and unsafe practices. It is recommended that you keep all of your lab reports until the end of the semester to study for the exams and as proof of your grade.

Plagiarism: Due to the nature of a lab class, many experiments will be carried out in a cooperative manner. You may be assigned to a group of 2-4 students. While the experimental data may be collected and reported together with your group, written answers on lab reports and quizzes and exams are expected to be YOUR OWN work. Copying and/or submission of another person's work will be considered plagiarism and a zero for the assignment OR "F" in the course may be assigned. For repeated or serious violations, an "XF" for the course may be assigned. Please refer to the academic integrity policies for more details.

Working areas: The chemicals and equipment needed to complete a lab will be placed out either on the lab bench, on the common area side bench, or in the hoods. It is **your responsibility** to keep these areas neat, clean and fully stocked before leaving the lab. Depletions of chemicals, as well as any missing or broken items should be brought to the attention of your lab instructor, and these items may be obtained from the storeroom in Temple Hall 403. Always clean your work area upon completion of each laboratory. Failure to do so will result in a loss of points for that lab.

Punctuality: The first few minutes of the laboratory are generally devoted to a discussion of safety issues or further description of the experiment to be performed. If you miss this explanation, you may not be allowed to perform the laboratory for safety reasons and you will receive a zero for that lab. Plan to be on time for all lab periods.

Preparation: It is **your responsibility** to read the correct laboratory experiments and complete any **pre-lab assignments** before the beginning of the laboratory period. Absence at the prior laboratory is not an excuse for not knowing the assignment. Refer to the laboratory schedule or the announcements posted on the Blackboard website to determine which lab will be performed for a given date. At the discretion of your laboratory instructor, you may be denied the opportunity to perform the laboratory experiments if you have not completed your key pre-lab assignment or reading. Lack of preparation is a safety hazard – both to yourself and your classmates.

Safety: Federal and state laws require that safety goggles be worn in all chemistry laboratories. You will need to obtain a pair of approved goggles (available at the MSU Bookstore). **Be sure to wear your safety goggles at all times** in the laboratory unless your instructor indicates that they are not needed (this will only occur when **NO** chemical work is being performed **ANYWHERE** in the lab). In general, you will not remove your safety goggles until you leave the laboratory. A first offense of not wearing safety goggles will receive a warning from the laboratory instructor. A second offense will result in your being asked to leave the laboratory and will result in a zero score for that experiment.

Be sure to know where all safety equipment (eye wash stations, fire extinguisher, safety shower) is located. Also, know where exits are located in case of an emergency. Materials Safety Data Sheets (MSDS) are available in the lab classroom and the chemical stock room (Temple Hall 403) for any student wishing to obtain further information concerning the chemicals being used in each experiment. Alternately, MSDS may be looked up online through a link on the chemistry department website (<http://chemistry.missouristate.edu/Links.html>, click on Materials Safety Data Sheets under Safety).

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Computer based laboratories: Many of the laboratories performed will involve using chemical sensors that are attached to handheld data collection devices (Vernier LabQuests) for automatic data recording and data analysis. The equipment for the CHM 117 laboratory were purchased with grant funds and thus theft of the LabQuests or probes would be considered and prosecuted as theft of property.

The use of electronic equipment in the chemistry laboratory also warrants additional precautions. Be very careful to keep solutions in the spill containment trays (when provided) and away from your LabQuest. Also, use the devices only for performing the specified laboratory investigation. Game playing or running of other programs is strictly prohibited. Anyone using the equipment for anything other than performing the specified laboratory will receive a score of zero for that laboratory assignment.

Nondiscrimination Policy: Missouri State University is an equal opportunity/affirmative action institution, and maintains a grievance procedure available to any person who believes he or she has been discriminated against. At all times, it is your right to address inquiries or concerns about possible discrimination to the Office for Equity and Diversity, Park Central Office Building, 117 Park Central Square, Suite 111, (417) 836-4252. Other types of concerns (i.e., concerns of an academic nature) should be discussed directly with your instructor and can also be brought to the attention of your instructor's Department Head. Please visit the OED website at www.missouristate.edu/equity/.

Disability Accommodation Policy: To request academic accommodations for a disability, contact the Director of Disability Services, Plaster Student Union, Suite 405, (417) 836-4192 or (417) 836-6792 (TTY), www.missouristate.edu/disability. Students are required to provide documentation of disability to Disability Services prior to receiving accommodations. Disability Services refers some types of accommodation requests to the Learning Diagnostic Clinic, which also provides diagnostic testing for learning and psychological disabilities. For information about testing, contact the Director of the Learning Diagnostic Clinic, (417) 836-4787, <http://psychology.missouristate.edu/ldc>.

Academic Dishonesty Policy: Missouri State University is a community of scholars committed to developing educated persons who accept the responsibility to practice personal and academic integrity. You are responsible for knowing and following the university's Student Academic Integrity Policies and Procedures, available at www.missouristate.edu/policy/academicintegritystudents.htm. You are also responsible for understanding and following any additional academic integrity policies specific to this class (as outlined by the instructor). Any student participating in any form of academic dishonesty will be subject to sanctions as described in this policy. If you are accused of violating this policy and are in the appeals process, you should continue participating in the class.

Dropping a Class: It is your responsibility to understand the University's procedure for dropping a class. If you stop attending this class but do not follow proper procedure for dropping the class, you will receive a failing grade and will also be financially obligated to pay for the class. For information about dropping a class or withdrawing from the university, contact the Office of the Registrar at 836-5520.

Cell Phone Policy: As a member of the learning community, each student has a responsibility to other students who are members of the community. When cell phones or pagers ring and students respond in class or leave class to respond, it disrupts the class. Therefore, the Office of the Provost prohibits the use by students of cell phones, pagers, PDAs, or similar communication devices during scheduled classes. All such devices must be turned off or put in a silent (vibrate) mode and ordinarily should not be taken out during class. Given the fact that these same communication devices are an integral part of the University's emergency notification system, an exception to this policy would occur when numerous devices activate simultaneously. When this occurs, students may consult their devices to determine if a university emergency exists. If that is not the case, the devices should be immediately returned to silent mode and put away. Other exceptions to this policy may be granted at the discretion of the instructor.

Students who require assistance during an emergency evacuation: Students who require assistance during an emergency evacuation must discuss their needs with their professors and Disability Services. If you have emergency medical information to share with me, or if you need special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible. For additional information students should contact the Disability Resource Center, 836-4192 (PSU 405), or Larry Combs, Interim Assistant Director of Public Safety and Transportation at 836-6576. For further information on Missouri State University's Emergency Response Plan, please refer to the following web site: <http://www.missouristate.edu/safetran/erp.htm>

MoSTEP High School (9-12) Chemistry (Categorical) Subject Area Competencies:

In completing this course, the beginning (preservice) Chemistry 9-12 teacher will demonstrate knowledge of and/or competency in the following areas of study:

1: Unifying Concepts and Processes

The beginning teacher of science is familiar with, and teaches, the major concepts and principles that unify all scientific effort and that are used in each of the science disciplines (1997 SSC: 1.2; CR GenEd, III.Sc-Chem; NSTA [2001]: Standard 1; NSTA [1998], Standard 1; NSES: UCP- 1-5.

- 1.1 systems, order, and organization;
- 1.2 evidence, models, and explanation;
- 1.3 change, constancy, and measurement;
- 1.4 evolution and equilibrium; and
- 1.5 form and function

2: Science As Inquiry

The beginning teacher of science understands and practices the science inquiry process. (1997 SSC: 1.1, 1.4; CR GenEd, III.Sc- Chem; NSTA [2001]: Standard 3, 9; NSTA [1998], Standard 3, 9; NSES: HA1, A2; S 1, 2, 7-81; ETS 0245: VI, VII)

- 2.1 identify questions and concepts that guide scientific investigations.
- 2.2 design and conduct scientific investigations, including understanding of the major concepts in the area being investigated, of proper equipment, of safety precautions; resolving methodological problems; using technologies; clarifying ideas that guide the inquiry; and obtaining scientific knowledge from sources other than the actual investigation; clarifying the question, method, controls, and variables; organizing and displaying data; revising methods and explanations; and public presentation of the results with a critical response from peers; using evidence; applying logic; and constructing an argument for the proposed explanations.
- 2.3 use appropriate tools (e.g., hand tools, measuring instruments, calculators, and computers for the collection, summary, and display of evidence), techniques, and mathematics to gather, analyze, and interpret data, including selecting the scientific apparatus or instrument appropriate to a specified laboratory or field task and identifying proper operation of such equipment; using the metric system of measurement, recognizing equivalents within that system and selecting units appropriate to a given laboratory or field task; converting between scientific notation and conventional numerals and using scientific notation to perform calculations.
- 2.4 formulate and revise scientific explanations and models using logic and evidence, including discussing, formulating, and revising an explanation or physical, conceptual, and/or mathematical models based on scientific knowledge, use of logic, and evidence from the investigation.
- 2.8 use mathematics in all aspects of scientific inquiry to ask questions; to gather, organize, and present data; and to structure convincing explanations.
- 2.9 handle, label, store, and dispose of chemicals, electrical equipment, and scientific apparatuses and take actions to prevent or report an emergencies, including, but not limited to, general first aid as it relates to incidents in the science classroom or laboratory. (NSTA 9.b)

3: Physical Science

The beginning teacher of science understands the central concepts, tools of inquiry, and structures of the physical sciences and makes these aspects of subject matter meaningful for students. (1997 SSC:

2.1-2.8; CR GenEd, III.Sc-Chem; NSTA [2001]: Rationale; Standard 1; NSTA [1998], Standard 1; NSES: H- B1, B2, B3, B5, B6; S 1, 2, 7-8; ETS 0245: I, II, IV)

3.1 Structure of Atoms (NSES: H-B1)

3.2 Structure and Properties of Matter (1997 SSC: 2.1-.8; NSES: H-B2)

3.3 Interactions of Energy and Matter (1997 SSC: 2.1-.8; NSES: H-B6)

3.4 General Chemistry and Chemical Reactions in Physical and Life Science (1997 SSC: 2.2-.5; NSES: H-B3)

6: Science and Technology

The beginning teacher of science understands the relationship between science and technology, can distinguish between natural objects and objects made by humans, and makes these aspects of subject matter meaningful for students by creating experiences in making models of useful things and by developing students' abilities to identify and communicate a problem and to design, implement, and evaluate a solution. (1997 SSC: 1.3, 1.4; NSTA [2001], Standards 4, 5.d; NSTA [1998] Standards 2, 4, 5; NSES: H-E1, E2, E3; S 8; ETS 0245: VI)

6.6 use computer and related technologies to extend investigative activities (NSES: H-E2)

6.7 identify and organize materials and other resources, choose suitable tools and techniques, and work with appropriate measurement methods to ensure adequate accuracy in the implementation of a proposed design. (NSES: H-E1)

6.8 analyze and interpret data obtained from an experiment or investigation, including graphical data, and identify and demonstrate an understanding of sources of error in data that is presented (NSES: H-E1)

6.9 demonstrate understanding of scientific measurement and notation systems, including systems for describing very large and very small units (NSES: H-E1)

6.10 collaborate as a team-member in the identification, communication, and resolution of scientific and technological problems. (NSES: H-E2)

6.12 use words, drawings, and models to communicate the process and products of technological design and scientific investigation (NSES: H-E1)

6.13 use criteria relevant to the original purpose or need to evaluate completed technological designs or products (NSES: H-E1)

MoSTEP 1.2.1.1: Unified Science 9-12 with Chemistry Competencies

Approved by MSBE: 8/2008

The beginning (preservice) Unified Science 9-12: Chemistry teacher will demonstrate knowledge of and/or competency in the following areas of study:

1. Unifying Concepts (1997 SSC: 1.2, 1.4; NSTA [2003]: C.1; NSES: UCP-1-5)

1. Multiple ways our perceptions of the world are organized and how we use systems to organize the studies and knowledge of science.
2. Nature of scientific evidence and the use of models for explanation.
3. Measurement as a way of knowing and organizing observations of constancy and change.
4. Evolution of natural systems and factors that result in evolution or equilibrium.
5. Interrelationships of form, function, and behaviors in living and nonliving systems.

3. Inquiry (1997 SSC: 1.1, 1.4; CR: see note RE: Methods course; 1.1; NSTA [2003] 3; NSES: H-A1, A2; S 1, 2, 7-8; Praxis 0245: VI); NSES (NRC, 2000)

1. The processes, tenets, and assumptions of multiple methods of inquiry leading to scientific knowledge.
3. Engage scientifically oriented questions, give priority to evidence, formulate explanations from evidence, connect explanations to scientific knowledge, and communicate and justify explanations to others.

5. Safety and Welfare (1997 SSC: 1.7; CR: see DESE CR note RE: Methods course; NSTA [2003] 9.b, 9.c, 9.a; Praxis 0245: VII)

1. Handle, label, store, & dispose of chemicals, electrical equipment, & scientific apparatuses & take actions to prevent or report emergencies, including, but not limited to, general first aid as it relates to incidents in the science classroom or laboratory.

6. Chemistry Core Competencies (1997 SSC: 2.1-8; NSTA C.3.a; CR: 2.c; NSES: H-B1, B2, B3, B5, B6; S 1, 2, 7-8; Praxis 0245: II, III, IV, V)

1. Fundamental structures of atoms and molecules.
2. Basic principles of ionic, covalent, and metallic bonding.
3. Physical and chemical properties and classification of elements including periodicity.
6. Mole concept, stoichiometry, and laws of composition.
8. Acids and bases; oxidation-reduction chemistry; solutions; chemical equilibrium; acid base titration/pH; instrumentation.
12. Fundamental processes of investigating in chemistry, including laboratory skills.

9. Physics Core Competencies (1997 SSC: 3.1-7; CR: V.2.d; NSTA [2003]: C.5; NSES: H-B1, B2, B3, B5, B6; S 1, 2, 7-8; Praxis: ETS 0245: I, II, IV))

5. Physical properties of matter.

Schedule for CHM117 Lab, Fall 2012

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This schedule is tentative and may be changed as necessary by the lab supervisor in case of cancellation of classes due to bad weather, etc. Changes to the schedule will be announced in class, sent by email, and posted to the course Blackboard website.

Lab

Aug 21-22	Lab 0 - Introduction/Safety
Aug 28-29	Lab 1 - Measurement, Precision, Accuracy, Graphing
Sep 4-5	Lab 2 - Problem Solving
Sep 11-12	Lab 3 - Density Investigations
Sep 18-19	Lab 4 - White Powders I
Sep 25-26	Lab 5 - White Powders II
Oct 2-3	Lab 6 - Empirical Formulas
Oct 9-10	MIDTERM EXAM
Oct 16-17	Lab 7 - Molecular Models
Oct 23-24	Lab 8 - Cu Later
Oct 30-31	Lab 9 - Gas Laws
Nov 6-7	Lab 10 - Solution Conductivity
Nov 13-14	Lab 11 - Beer's Law
Nov 20-21	Thanksgiving week - No lab
Nov 27-28	Lab 12 - Neutralization of Acids
Dec 4-5	FINAL EXAM

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Missouri State University
Curricular Proposal Course Change or Deletion

Department CHM

Date 11/29/12

Check one: This is a change to an existing COURSE
 an existing REGULAR (i.e. permanent) SECTION of a variable content course

Present Catalog Description (Cut and paste from web catalog or use most recent description.)	Revised Catalog Description (Cut and paste description again, strikethrough all deletions, and insert and bold new information.)
<p>CHM 105 Fundamentals of Chemistry</p> <p>Prerequisite: eligibility for MTH 103 or have completed MTH 103, or be concurrently enrolled in MTH 102. General Education Course (Natural World). Emphasis on chemical fundamentals and applications. Recommended for students needing only one semester of general chemistry. (CHM 105 will not count toward a chemistry major or minor.) Course does satisfy prerequisite for CHM 200. A grade of "C-" or better is required in this course in order to take CHM 200. May not be taken Pass/Not Pass. Supplemental course fee. 5(4-2) F,S</p>	

What is changing? Check all boxes that apply.

- Course Deletion
 Course Code
 Course Number
 Title
 Prerequisite
 Credit Hours/Contact Hours
 Periodicity
 Description

Reason for Proposed Change or Deletion

The courses CHM105 (lecture and lab) and 106 (lecture only) are being altered to have a single course which is lecture only (CHM116) and a single course that is the associated lab (CHM117). CHM105 is then being deleted. This will alleviate problems with student registration and advising associated with transfer credits from institutions where these courses were separate. The numbering is now higher than the proposed CHM107/108 courses (previously CHM107) as CHM116 and 117 are more advanced in material. This is now consistent with the rest of the course numberings in the department.

How Did You Determine the Need For This Change or Deletion?

There has been a large numbering of transfer credit problems associated with these courses. This will also allow for separation of grades in the performance of these courses. The Registrar's office suggested structuring these proposed changes in this fashion to alleviate as many registration problems as possible.

COMPLETE NEW CATALOG INFORMATION (typed)

Check if this is a non-substantive change. Distribution for non-substantive changes of 100- through 500-level courses: two originally-signed copies to Faculty Senate; 600- through 900-level courses: three originally-signed copies to Graduate Council. Graduate Council will give two copies to Faculty Senate after approval.

Substantive Change: Department routes according to ART VI, SEC 3B(1-4) of Bylaws of the Faculty. Forward three originally signed forms to one of the following (please check all that apply and send to first council/committee marked). If proposal needs to go through more than one council/committee, forward one additional form for each additional council/committee marked. See Senate Action 11-93/94 for definitions of substantive/non-substantive changes.

- College Council (All substantive course changes numbered 100-599 must go through College Council first. After approval, College Council will forward appropriate number of copies to the next committee/council or directly to the Faculty Senate if no further committee approval is needed. The last level of committee/council will forward two originally signed copies to the Faculty Senate.)
- Professional Education Committee (Considers all substantive course changes for Professional Education courses and Teaching Methods courses.)
- Committee on General Education and Intercollegiate Programs (Considers all substantive course changes for General Education and Intercollegiate Program proposals.)
- Graduate Council (Considers all 600-900 level course changes.)

Signature [Signature]
Department Head

Date 11/29/12

(Routing on Reverse Side)

**Missouri State University
Curricular Proposal Course Change or Deletion**

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Department CHM Date 11/29/12

Check one: This is a change to an existing COURSE
 an existing REGULAR (i.e. permanent) SECTION of a variable content course

Present Catalog Description (Cut and paste from web catalog or use most recent description.)	Revised Catalog Description (Cut and paste description again, strikethrough all deletions, and insert and bold new information.)
<p>CHM 106 Fundamentals of Chemistry</p> <p>Prerequisite: eligibility for MTH 103 or have completed MTH 103, or be concurrently enrolled in MTH 102. General Education Course (Natural World). Same course as CHM 105 except it does not include a laboratory component. Emphasis on chemical fundamentals and applications. Recommended for students needing only one semester of introductory chemistry. (CHM 106 will not count toward a chemistry major or minor.) May not receive credit for both CHM 105 and 106. Students should be aware that CHM 106 may not satisfy the chemistry requirement for other majors. 4(4-0) F,S</p>	<p>CHM 106 116 Fundamentals of Chemistry</p> <p>Prerequisite: Concurrent enrollment in MTH102 or 103 or eligibility for a MTH-103 or higher math course have completed MTH-103, or be concurrently enrolled in MTH 102. General Education Course (Natural World). Concurrent registration in CHM117 (Fundamentals of Chemistry Laboratory) is highly recommended. . Same course as CHM 105 except it does not include a laboratory component. Emphasis on chemical fundamentals and applications. Recommended for students needing only one semester of introductory chemistry. (CHM 106 116 will not count toward a chemistry major or minor.) May not receive credit for both CHM 105 and 106. Students should be aware that CHM 106 may not satisfy the chemistry requirement for other majors. 4(4-0) F,S</p>

What is changing? Check all boxes that apply.

- Course Deletion Course Code Course Number Title Prerequisite
 Credit Hours/Contact Hours Periodicity Description

Reason for Proposed Change or Deletion

The courses CHM105 (lecture and lab) and 106 (lecture only) are being altered to have a single course which is lecture only (CHM116) and a single course that is the associated lab (CHM117). CHM105 is then being deleted. This will alleviate problems with student registration and advising associated with transfer credits from institutions where these courses were separate. The numbering is now higher than the proposed CHM107/109 courses (previously CHM107) as CHM116 and 117 are more advanced in material. This is now consistent with the rest of the course numberings in the department.

How Did You Determine the Need For This Change or Deletion?

There has been a large numbering of transfer credit problems associated with these courses. This will also allow for separation of grades in the performance of these courses. The Registrar's office suggested structuring these proposed changes in this fashion to alleviate as many registration problems as possible.

COMPLETE NEW CATALOG INFORMATION (typed)

CHM 116 Fundamentals of Chemistry

Prerequisite: Concurrent enrollment in MTH102 or 103 or eligibility for a higher math course. General Education Course (Natural World). Concurrent registration in CHM117 (Fundamentals of Chemistry Laboratory) is highly recommended. Emphasis on chemical fundamentals and applications. Recommended for students needing only one semester of introductory chemistry. (CHM ~~106~~ **116** will not count toward a chemistry major or minor.) 4(4-0) F,S

___ Check if this is a **non-substantive** change. Distribution for non-substantive changes of 100- through 500-level courses: two originally-signed copies to Faculty Senate; 600- through 900-level courses: three originally-signed copies to Graduate Council. Graduate Council will give two copies to Faculty Senate after approval.

Substantive Change: Department routes according to ART VI, SEC 3B(1-4) of Bylaws of the Faculty. Forward three originally signed forms to one of the following (please check all that apply and send to first council/committee marked). If proposal needs to go through more than one council/committee, forward one additional form for each additional council/committee marked. See Senate Action 11-93/94 for definitions of substantive/non-substantive changes.

- College Council** (All substantive course changes numbered 100-599 must go through College Council first. After approval, College Council will forward appropriate number of copies to the next committee/council or directly to the Faculty Senate if no further committee approval is needed. The last level of committee/council will forward two originally signed copies to the Faculty Senate.)
 Professional Education Committee (Considers all substantive course changes for Professional Education courses and Teaching Methods courses.)
 Committee on General Education and Intercollegiate Programs (Considers all substantive course changes for General Education and Intercollegiate Program proposals.)
 Graduate Council (Considers all 600-900 level course changes.)

Signature [Signature] Date 11/29/12
 Department Head

(Routing on Reverse Side)

22

Missouri State University Curricular Proposal Course Change or Deletion

Department CHM

Date 11/29/12

Check one: This is a change to an existing COURSE
 an existing REGULAR (i.e. permanent) SECTION of a variable content course

Present Catalog Description (Cut and paste from web catalog or use most recent description.)	Revised Catalog Description (Cut and paste description again, strikethrough all deletions, and insert and bold new information.)
<p>CHM 107 Chemistry for the Citizen</p> <p>General Education Course (Natural World). A one semester course for the non-science major. Principal concepts and applications of chemistry are presented. The course looks at both the beneficial side of chemical usage and the problems associated with chemical production and usage. The course provides information needed for a better understanding of environmental concerns, the chemical industry, consumer products and our alternate sources and storage of energy. Supplemental course fee. 4(3-2) F,S</p>	<p>CHM 107 Chemistry for the Citizen</p> <p>General Education Course (Natural World). Concurrent registration in CHM108 (Chemistry for the Citizen Laboratory) is highly recommended. A one semester course for the non-science major. Principal concepts and applications of chemistry are presented. The course looks at both the beneficial side of chemical usage and the problems associated with chemical production and usage. The course provides information needed for a better understanding of environmental concerns, the chemical industry, consumer products and our alternate sources and storage of energy. Supplemental course fee-4(3-2) 3 (3-0) F,S</p>

What is changing? Check all boxes that apply.

- Course Deletion Course Code Course Number Title Prerequisite
 Credit Hours/Contact Hours Periodicity Description

Reason for Proposed Change or Deletion

CHM107 currently has a lecture and lab associated with the course. This change proposes to split the course to have a course which is lecture only (CHM107) and a course that is the associated lab (CHM108). This will alleviate problems with student registration and advising associated with transfer credits from institutions where these courses were separate. Also, as a planned General Education offering, the separate courses will allow students to satisfy General Goal 11 of the new Gen Ed program as either a lab or non-lab experience by taking CHM 107 w/ or w/o CHM 108.

How Did You Determine the Need For This Change or Deletion?

There have been a large numbering of transfer credit problems associated with these courses. This will also allow for separation of grades in the performance of these courses. The Registrar's office suggested structuring these proposed changes in this fashion to alleviate as many registration problems as possible. Also, flexibility for students in satisfying the new Gen Ed Goal 11 is being addressed.

COMPLETE NEW CATALOG INFORMATION (typed)

CHM 107 Chemistry for the Citizen

General Education Course (Natural World). Concurrent registration in CHM108 (Chemistry for the Citizen Laboratory) is highly recommended. A one semester course for the non-science major. Principal concepts and applications of chemistry are presented. The course looks at both the beneficial side of chemical usage and the problems associated with chemical production and usage. The course provides information needed for a better understanding of environmental concerns, the chemical industry, consumer products and our alternate sources and storage of energy. 3 (3-0) F,S

Check if this is a non-substantive change. Distribution for non-substantive changes of 100- through 500-level courses: two originally-signed copies to Faculty Senate; 600- through 900-level courses: three originally-signed copies to Graduate Council. Graduate Council will give two copies to Faculty Senate after approval.

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College Council

(All substantive course changes numbered 100-599 must go through College Council first. After approval, College Council will forward appropriate number of copies to the next committee/council or directly to the Faculty Senate if no further committee approval is needed. The last level of committee/council will forward two originally signed copies to the Faculty Senate.)

Professional Education Committee

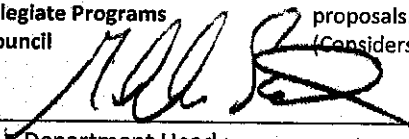
(Considers all substantive course changes for Professional Education courses and Teaching Methods courses.)

Committee on General Education and Intercollegiate Programs

(Considers all substantive course changes for General Education and Intercollegiate Program proposals.)

Graduate Council

(Considers all 600-900 level course changes.)

Signature  Department Head

Date 11/29/12