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**Missouri State.****Curricular Action Workflow**

Missouri State &gt; Computer Services - MIS &gt; Curricular Action Workflow &gt; CAW - Change Course Proposal Form

## Change Course Proposal Form

Submitted on 10/07/2015 by Matthew Siebert ([MSiebert@MissouriState.edu](mailto:MSiebert@MissouriState.edu)).**\*All fields require input**

This proposal applies to:

 An existing COURSE

An existing REGULAR (e.g. permanent) SECTION of a variable content course.

Existing Course:

CHM201 Essentials/Organic Chemistry

Is this a general education course?  No  YesWill this course affect professional education and need to be reviewed by EPPC?  No  Yes

Current online catalog description:

CHM 201 Essentials/Organic Chemistry

Prerequisite: a "C-" grade or better in CHM 116 or CHM 170. Principles of organic chemistry and biochemistry. The laboratory associated with this course is CHM 202. Cannot be counted toward a chemistry major or minor if student passes CHM 342. 3(3-0) F,S

Revise the current online catalog description as needed:

CHM 201 Essentials/Organic Chemistry

Prerequisite: a "C-" grade or better in CHM 116 or CHM 160. Principles of organic chemistry and biochemistry. The laboratory associated with this course is CHM 202. Cannot be counted toward a chemistry major or minor if student passes CHM 342. 3(3-0) F,S

What is changing? Check all boxes that apply.

- |   |   |                                      |                                       |
|---|---|--------------------------------------|---------------------------------------|
| <input type="checkbox"/> Course Code                | <input type="checkbox"/> Course Number (Check Availability) | <input type="checkbox"/> Title       | <input type="checkbox"/> Prerequisite |
| <input type="checkbox"/> Credit Hours/Contact Hours | <input type="checkbox"/> Periodicity                        | <input type="checkbox"/> Description |                                       |

1

Reason for proposed change

The original prerequisite required either a one-semester survey course, or completion of a one-year course. It was brought to our attention that it benefits some biology majors to take the first semester of the full-year course and then take CHM201. Also, the lab course associated with CHM201 (CHM202) requires only the first-semester (lab) of the full-year course, and the changes proposed herein rectify the logical inconsistency that a lecture course have more prerequisites than its associated lab course.

Does this change affect course assessment?  No  Yes

How did you determine the need for this change? Check all boxes that apply or specify other.

- Routine or annual review/assessment of curriculum
- Faculty Input
- Student Input
- Accreditation/certification compliance
- Review of catalog information
- Other (be specific):

Check if this is a non-substantive change. **i**

What is the date that this course change was approved by departmental or program faculty? (MM/DD/YYYY)

10/06/2015

Current Status:

College Council Review

Proposal Progress:

10/13/2015 - Department Head Review - Bryan Breyfogle - Approved

Review Comments:

No comments have been added to this proposal.

Copy to New Proposal



**Missouri State.****Curricular Action Workflow**

Missouri State &gt; Computer Services - MIS &gt; Curricular Action Workflow &gt; CAW - New Course Proposal Form

## New Course Proposal Form

Submitted on 10/07/2015 by Matthew Siebert ([MSiebert@MissouriState.edu](mailto:MSiebert@MissouriState.edu)).**\*All fields require input** New COURSE New REGULAR PERMANENT SECTION of an existing variable content course. If a new regular section of an existing variable topics course, enter the existing course number below

Course Code:

CHM

Course Number: ([Check Availability](#))

242

Course Title:

Preparing for Organic Chemistry

Will this course affect professional education and need to be reviewed by EPPC?  No  Yes

Prerequisite/Co-requisite or enter 'None':

"C-" or better in CHM 170 or concurrent enrollment

General Course Description: (Include any Pass/Not Pass grading restrictions, repeatable limits, limitation on course applicability, UG/GR parallel course, etc.)

Bridging the gap between CHM 170 and CHM 342, including discussion of how general chemistry differs from organic chemistry, study strategies for organic chemistry, and general chemistry topics discussed in terms of their application to organic chemistry.

Credit Hours:

1

Lecture Contact Hours:

1

Lab Contact Hours:

0

Note: If variable credit, enter the highest number and add to end of course description. (e.g. "Variable credit, may be taken 1-3 hours.")

Periodicity. Check all that apply.



Fall



Fall (even-numbered years only)



Fall (odd-numbered years only)



Spring



Spring (even-numbered years only)



Spring (odd-numbered years only)

Summer  On Demand only

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**Complete Catalog Description:**

CHM 242 Preparing for Organic Chemistry

Prerequisite: "C" or better in CHM 170 or concurrent enrollment

Bridging the gap between CHM 170 and CHM 342, including discussion of how general chemistry differs from organic chemistry, study strategies for organic chemistry, and general chemistry topics discussed in terms of their application to organic chemistry.

Credit hours: 1 Lecture contact hours: 1 Lab contact hours: 0

Typically offered: On Demand only

Include sample syllabus (list topics, course goals.) Use text box OR upload only file types of PDF, DOC or DOCX.

A sample syllabus has been attached [View](#)

**Purpose of Course**

To bridge the gap between general (CHM170) and organic (CHM342) chemistry. Students often struggle with the transition from a 100-level to a 300-level course. Additionally, knowledge-base seems to vary greatly for incoming CHM342 students based on what school they attended, how long has passed since general chemistry, and their instructor (amongst other factors).

**Relationship to Other Departments**

This will not directly impact other departments. It is a one credit-hour course focused on student retention and success in CHM342 offered during an intersession period that will not directly impact student workload. Further, this class will not count towards any major or minor.

Is there a graduate/undergraduate parallel course to this one?  No  Yes

**New Course Resource Information**

Anticipated Average Enrollment per section:

50

Maximum Enrollment Limit per section:

80

Anticipated Average Enrollment per semester:

50

Maximum Enrollment Limit per semester:

80

Anticipated Average Enrollment per year:

100

Maximum Enrollment Limit per year:

160

Faculty Load Assignment (equated hours):

1

Is another course being deleted?  No  Yes

What will this course require in the way of:

Additional Library Holdings

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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

Additional faculty; regular vs per-course

None

Other additional expenses

None

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

This is an intercession course, as such, it will not conflict with normal teaching assignments.

List names of current faculty qualified and available to teach this course

2

all

What is the anticipated source of students for this course?

Any major that requires CHM342. The majors that contribute the bulk of students to this category are: Chemistry, Biology, and Biomedical Sciences.

If from within the department, will students be taking this course in addition to or in place of other courses?

In addition to other courses. It is a one credit-hour course focused on student retention and success in CHM342 offered during an intersession period that will not directly impact student workload.

If from outside the department, which courses in other departments would most likely be affected?

All students will take this course in addition to other courses. It is a one credit-hour course focused on student retention and success in CHM342 offered during an intersession period that will not directly impact student workload.

Other comments:

This is an intersession course focused on student retention and success.

What is the date that this new course was approved by departmental or program faculty? (MM/DD/YYYY)

10/06/2015

**Current Status:**

College Council Review

**Proposal Progress:**

10/13/2015 - Department Head Review - Bryan Breyfogle - Approved

**Review Comments:**

10/13/2015 - Department Head Review - Bryan Breyfogle - Prerequisite: 7C-? or better in CHM 170 or concurrent enrollment Should read: Prerequisite: "C-" or better in CHM 170 or concurrent enrollment



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CHM 197-701

Preparing for Organic Chemistry

Fall Intersession 2015

Class

MTWRF, 9:00-12:30, Temple 002

Dr. Matthew Siebert

MSiebert@MissouriState.edu, Temple 408

Mr. Brian High

BHigh@MissouriState.edu, Temple 402

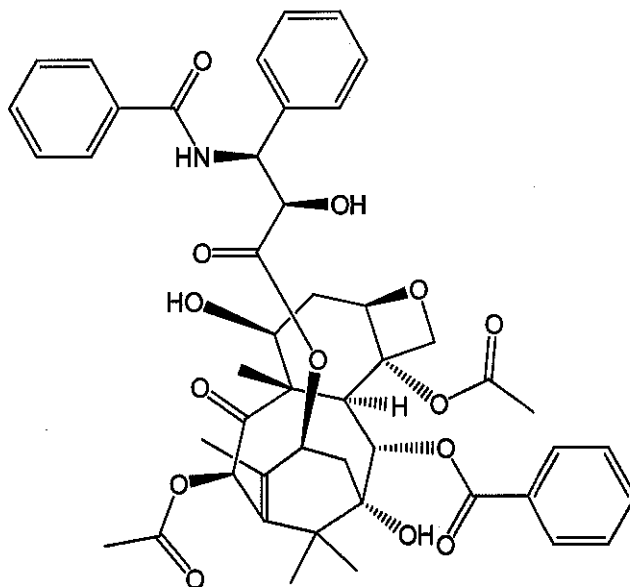
Office Hours: by appointment

### REQUIRED MATERIALS

Clicker Turning Technologies QT Device (or the like) and TurningPoint Cloud account.

### COURSE OBJECTIVES

This course is listed as: "Bridging the gap between CHM 170 and CHM 342, including discussion of how general chemistry differs from organic chemistry and study strategies for organic chemistry. Additional general chemistry topics will be discussed in terms of their application to organic chemistry: Equilibria, Rate Law, Stoichiometry, Percent Yield, Acid/Base Theories, Molarity/Concentration/Dilution, Bonding Theories, Trends in the Periodic Table, and Intermolecular Forces & Solubility"



### DISCLAIMER

We reserve the right to make modifications to this syllabus as necessary. Any modifications will be made with everyone's best interests in mind and will likely benefit you. You will be informed of any changes if/when they occur.

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## ANTICIPATED SCHEDULE

The schedule below is tentative; topics may be shifted earlier/later or dropped depending on the pace of the class.

Monday – M. Siebert

- Introduction
- How gen. chem. differs from organic
- Organic functional groups

Tuesday – B. High

- Trends in the periodic table
- Electron configurations
- Orbital diagrams
- Bond types and polarity

Wednesday

- Molarity/concentration/dilution – B. High
- Stoichiometry – B. High
- Bonding theories – M. Siebert

Thursday

- Intermolecular forces – B. High
- Solutions – B. High
- Chemical equilibria – M. Siebert

Friday – M. Siebert

- Acid/base chemistry
- Rate laws

## EVALUATION/FEEDBACK

	Credit
Clickers	70%
Worksheets	30%
<b>TOTAL</b>	<b>100%</b>

**Grades:** A 100-89%, B 88.99-79%, C 78.99-69%, D 68.99-59%, F below 59%. Grades will not be rounded.

**Exams:** There will be NO exams for this intersession class.

**Clickers:** Clicker points will be assigned based on the proportion of clicker question responses received throughout the course. Clickers are used to record attendance/participation as well as to assess student understanding. Each substantive clicker question (i.e., those that have a "correct" answer) is broken up into 80% attendance/participation and 20% assessment (getting the correct answer).

**Worksheets:** Lecture will be broken up by periods of student work on worksheets/practice problems. You are encouraged to work in groups on these worksheets/practice problems, but be sure you understand each question and input your responses on Blackboard.

## UNIVERSITY POLICIES

**Academic Dishonesty:** 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 and also available at the Reserves Desk in



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Meyer Library. Any student participating in any form of academic dishonesty will be subject to sanctions as described in this policy.

**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 Institutional Equity and Compliance, 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/](http://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](http://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>.

**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 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 Donald Clark, Director of Safety and Transportation, at 836-8870. 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>.

**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.

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## Change Course Proposal Form

Submitted on 10/07/2015 by Matthew Siebert ([MSiebert@MissouriState.edu](mailto:MSiebert@MissouriState.edu)).**\*All fields require input**

This proposal applies to:

 An existing COURSE

An existing REGULAR (e.g. permanent) SECTION of a variable content course.

Existing Course:

CHM300 Service Learning in Chemistry

Is this a general education course?  No  YesWill this course affect professional education and need to be reviewed by EPPC?  No  Yes

Current online catalog description:

CHM 300 Service Learning In Chemistry

Prerequisite: 30 hours, and concurrent registration in a chemistry course designated as a service learning offering. This service component for an existing course incorporates community service with classroom instruction in chemistry to provide an integrative learning experience that addresses the practice of citizenship and promotes an awareness of participation in public affairs. Includes 40 hours of service that benefits an external community organization, agency, or public service provider. Approved service placements and assignments will vary depending on the specific course topic and learning objectives; students should investigate possible placements, available through the Chemistry Department and the Citizenship and Service Learning Office, prior to registration. May be repeated. 1 F.S

Revise the current online catalog description as needed:

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## CHM 300 Service Learning in Chemistry

**Prerequisite:** 30 hours, and concurrent registration in a chemistry course designated as a service learning offering. This service component for an existing course incorporates community service with classroom instruction in chemistry to provide an integrative learning experience that addresses the practice of citizenship and promotes an awareness of participation in public affairs. Includes 40 hours of service that benefits an external community organization, agency, or public service provider. Approved service placements and assignments will vary depending on the specific course topic and learning objectives; students should investigate possible placements, available through the Chemistry Department and the Citizenship and Service Learning Office, prior to registration. May be repeated. 1 Upon demand

What is changing? Check all boxes that apply.

- Course Code       Course Number (Check Availability)       Title       Prerequisite  
 Credit Hours/Contact Hours       Periodicity       Description

Reason for proposed change

This change is to align the catalog description to departmental policy.

Does this change affect course assessment?  No  Yes

How did you determine the need for this change? Check all boxes that apply or specify other.

- Routine or annual review/assessment of curriculum       Faculty Input       Student Input  
 Accreditation/certification compliance       Review of catalog information

Other (be specific):

Check if this is a non-substantive change. **i**

What is the date that this course change was approved by departmental or program faculty? (MM/DD/YYYY)

10/06/2015

**Current Status:**

College Council Review

**Proposal Progress:**

10/13/2015 - Department Head Review - Bryan Breyfogle - Approved

**Review Comments:**

No comments have been added to this proposal.

**Missouri State.**

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**Curricular Action Workflow**

Missouri State &gt; Computer Services - MIS &gt; Curricular Action Workflow &gt; CAW - New Course Proposal Form

## New Course Proposal Form

Submitted on 10/08/2015 by G Schick ([AlanSchick@MissouriState.edu](mailto:AlanSchick@MissouriState.edu)).**\*All fields require input** New COURSE

New REGULAR PERMANENT SECTION of an existing variable content course. If a new regular section of an existing variable topics course, enter the existing course number below

Course Code:

CHM

Course Number: (Check Availability)

635

Course Title:

Investigations in Chemistry for Teachers

Will this course affect professional education and need to be reviewed by EPPC?  No  Yes

Prerequisite/Co-requisite or enter 'None':

Coursework sufficient to meet Missouri certification standards for secondary/middle school science teaching.

General Course Description: (Include any Pass/Not Pass grading restrictions, repeatable limits, limitation on course applicability, UG/GR parallel course, etc.)

Techniques in performing science investigation with application to secondary and middle school science. May be taught concurrently with CHM 435. Cannot receive credit for both CHM 435 and CHM 635.

Credit Hours:

1

Lecture Contact Hours:

2

Lab Contact Hours:

0

Note: If variable credit, enter the highest number and add to end of course description. (e.g. "Variable credit, may be taken 1-3 hours.")

Periodicity. Check all that apply.

Fall

Fall (even-numbered years only)

Fall (odd-numbered years only)

Spring

Spring (even-numbered years only)

Spring (odd-numbered years only)

Summer

On Demand only

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**Complete Catalog Description:**

CHM 635 Investigations in Chemistry for Teachers

Prerequisite: Coursework sufficient to meet Missouri certification standards for secondary/middle school science teaching.

Techniques in performing science investigation with application to secondary and middle school science. May be taught concurrently with CHM 435. Cannot receive credit for both CHM 435 and CHM 635.

Credit hours: 1 Lecture contact hours: 2 Lab contact hours: 0

Typically offered: Spring (odd-numbered years only)

Include sample syllabus (list topics, course goals.) Use text box OR upload only file types of PDF, DOC or DOCX.

A sample syllabus has been attached [View](#)**Purpose of Course**

CHM 635 constitutes a 1-credit component of existing course CHM 735 that parallels CHM 435 of the same name. For HLC compliance, CHM 735 cannot overlap a 400-level (undergraduate) course as it currently does in part with CHM 435. Our plan is to split the 3-credit CHM 735 into two components: This new course, CHM 635 (1 credit), which will parallel the existing CHM 435 (1 credit) and a modified CHM 735 (for graduates only; being submitted as a Course Change) that entails a special project (2 credit). Thus, there are two separate curricular proposals being submitted for the purpose of maintaining HLC compliance: This one for a NEW 1-credit CHM 635, and a separate one for a 2-credit CHANGED version of CHM 735.

**Relationship to Other Departments**

This course will be taken by in-service teachers with other science backgrounds (BIO, GLY, etc.). No other department on campus offers a course like this specifically for Chemistry applications.

Is there a graduate/undergraduate parallel course to this one? No  Yes

Enter parallel course number

CHM435 Investigations in Chemistry

How do these classes differ?

CHM 635 contains an additional graduate-level activity (see sample syllabus).

**New Course Resource Information**

Anticipated Average Enrollment per section:

5

Maximum Enrollment Limit per section:

15

Anticipated Average Enrollment per semester:

5

Maximum Enrollment Limit per semester:

15

Anticipated Average Enrollment per year:

5

Maximum Enrollment Limit per year:

15

4

Faculty Load Assignment (equated hours): 2

Is another course being deleted?  No  Yes

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.

Additional faculty; regular vs per-course

none.

Other additional expenses

none.

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

n/a

List names of current faculty qualified and available to teach this course

Bryan Breyfogle

Gautam Bhattacharyya

What is the anticipated source of students for this course?

Local high-school science teachers and MSED students with a chemistry emphasis.

If from within the department, will students be taking this course in addition to or in place of other courses?

no.

If from outside the department, which courses in other departments would most likely be affected?

none.

Other comments:

none.

What is the date that this new course was approved by departmental or program faculty? (MM/DD/YYYY)

10/06/2015

**Current Status:**

Grad Council Review

**Proposal Progress:**

10/13/2015 - Department Head Review - Bryan Breyfogle - Approved

10/13/2015 - Dean Review - Tamera Jahnke - Reviewed

**Review Comments:**

No comments have been added to this proposal.



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## **CHM 635: Investigation in Chemistry for Teachers—Spring 2017**

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**Time and Location:** 6:00-8:00 p.m., Monday in Temple Hall 440 (Some nights Temple 120)

**Instructor:** Dr. Bryan E. Breyfogle

**Office:** 425 Temple Hall

**Office Hours:** TBA

**Office Phone:** 417-836-5601; **Fax:** 417-836-5507

**e-mail:** [bryanbreyfogle@missouristate.edu](mailto:bryanbreyfogle@missouristate.edu)

### **Required Materials**

1. School Chemistry Laboratory Safety Guide, downloadable (pdf) at <http://www.cdc.gov/niosh/docs/2007-107/pdfs/2007-107.pdf>
2. Missouri Secondary Science Safety Manual, Dept. of Elementary and Secondary Education, Judith L. Lemons (1997). Downloadable (pdf) at <https://dese.mo.gov/sites/default/files/secman.pdf>
3. A general chemistry or introductory chemistry textbook—check with instructor to have your textbook approved as appropriate. If you kept your general chemistry textbook, it should be appropriate. Otherwise you can borrow a book from me or check one out from the library.
4. Departmentally approved eye protection for chemical splashes that meets ANSI Z87 ratings. Visorgogs® and Chemical Splash Goggles are both acceptable and available through the University bookstore.

### **Course Description**

Techniques of performing science investigations with application to secondary and middle school science. The course is designed especially for science education students and secondary science teachers who desire training in current issues related to teaching chemistry at the secondary level. The focus is on teaching and managing the chemistry laboratory. Topics include lab safety, chemical ordering and storage, chemical waste disposal, legal issues for secondary teachers, computer-based laboratories, use of multimedia and simulation software, inquiry-based and traditional investigations, professional development opportunities for science teachers, and an overview of basic chemical knowledge imperative to teaching at the secondary level.

### **Purpose of the Course**

This course is designed to provide a foundation of practical knowledge upon which one can build to become a successful chemistry teacher at the high school level. The course prepares students for the challenges of teaching and managing an effective and safe laboratory by emphasizing activities that come from recent literature involving best practices for science teaching. Students are also prepared to be competent with some key technologies important to the teaching and learning of chemistry. Students gain firsthand experience in laboratory preparation, assessment and supervision via authentic experiences such as Science Olympiad, classroom observation and peer teaching. The importance of using standards-based activities is stressed and students are asked to align a project to state and national science standards. The course also encourages students to be lifelong learners by introducing them to professional development opportunities for teachers.



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## Course Competencies

The student will show that he/she can demonstrate the following performance-based competencies:

1. An understanding of the process of scientific inquiry through various instructional methods including verification, guided inquiry and open inquiry investigations.
2. Ability to make relationships between chemistry and the other sciences and to recognize common themes in the sciences
3. Appropriate use of mathematics, measurement and technology as it relates to teaching in the chemistry classroom and laboratory. This will include the use of scientific probes typically used in the high school laboratory.
4. Knowledge of the persons responsible for developing key theories and models of chemistry and a realization of the effect that multi-cultural perspectives had upon them.
5. Ability to modify/design and implement an appropriate laboratory safety policy that is consistent with state and/or national guidelines and to communicate this need effectively to students of diverse backgrounds and capabilities. An understanding of the need to modify and change this plan as student needs and/or local, state and federal regulations mandate.
6. An understanding of the need to properly label, store, and dispose of chemicals and the ability to teach students the legal and environmental importance of compliance.
7. Knowledge of the physical preparation process for a secondary laboratory including ordering of supplies and chemicals, solution and chemical preparation, and the need to carefully plan a laboratory prior to having students perform it.
8. Ability to assess student performance in the laboratory using a variety of formal and informal assessment strategies including: performance-based labs, technical observation, discussion, written and oral reports.

## Course Policy Statements

**Accountability and Attendance Policy:** You will get out of this class what you put into it. Participation and discussion will play a critical role in this course. I expect each student in the class to be an active participant in all activities. Attendance is essential for this course because of the participatory nature of the course and because of the limited number of meeting times. Most of the assignments will have a significant in-class component and if you do not attend you will not get credit for this portion of the assignment. Some component of the course (science Olympiad for instance) will require students to commit time out of the normal time period scheduled for the class. These times will be provided to you well in advance of the events so you can plan accordingly.

**Emergency response statement:** At the first class meeting, students should become familiar with a basic emergency response plan through a dialogue with the instructor that includes a review and awareness of exits specific to the classroom and the location of evacuation centers for the building. All instructors are

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provided this information specific to their classroom and/or lab assignments in an e-mail prior to the beginning of the fall semester from the Office of the Provost and Safety and Transportation. Students with disabilities impacting mobility should discuss the approved accommodations for emergency situations and additional options when applicable with the instructor. For more information go to <http://www.missouristate.edu/safetran/51597.htm> and <http://www.missouristate.edu/safetran/erp.htm>.

**Religious accommodation:** The University may provide a reasonable accommodation based on a person's sincerely held religious belief. In making this determination, the University reviews a variety of factors, including whether the accommodation would create an undue hardship. The accommodation request imposes responsibilities and obligations on both the individual requesting the accommodation and the University. Students who expect to miss classes, examinations, or other assignments as a consequence of their sincerely held religious belief shall be provided with a reasonable alternative opportunity to complete such academic responsibilities. It is the obligation of students to provide faculty with reasonable notice of the dates of religious observances on which they will be absent by submitting a Request for Religious Accommodation Form to the instructor by the end of the third week of a full semester course or the end of the second week of a half semester course.

**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. Students are responsible for knowing and following the university's student honor code, Student Academic Integrity Policies and Procedures 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.

**Disability Accommodation:** To request academic accommodations for a disability, contact the Director of the Disability Resource Center, Carrington Hall, Room 302, 417-836-4192 or 417-836-6792 (TTY), [www.missouristate.edu/disability](http://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>.

**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/](http://www.missouristate.edu/equity/).

**Policy on Use of Cell Phones in Classes:** 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.

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## Grading Policy

Assignments must be handed in on time. Labs, presentations, and other in-class assignments cannot be made up unless arrangements are made well in advance of the absence and the absence is approved by the instructor. Validity of content, clarity of expression, grammatical construction, spelling, etc. will be considered in the grading of all written and presented work. The grading scale will be:

93-100% = A	90-92.9% = A-	87-89.9% = B+	82-86.9% = B
80-81.9% = B-	77-79.9% = C+	72-76.9% = C	70-71.9% = C-
68-69.9% = D+	64-67.9% = D	< 64% = F	

### Tentative Point Distribution

Chemical Inventory and Storage Assignment	25 points
Midterm exam (School Chemistry Lab Safety Guide)	75 points
Lab reviews/critiques (2)	25 points
Independent Laboratory design, pre-lab presentation, teacher preparation sheet <i>(At least 2 separate activities that utilize a unique instructional approach.)</i>	75 points
Science Olympiad Participation (preparation, assessment, supervision)	50 points
Final Exam Activity (Presentation of your independent lab project)	50 points
Class participation (assessed throughout the semester by activity & attendance)	100 points
<b>(CHM 635 only)</b> Literature review: Read and critique a paper from the chemistry education literature (see separate assignment description)	50 points
<b>Total</b>	<b>450 points</b>

## Course Topics

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1. Content Proficiency Review (to determine specific content area review topics)
  - a. PRAXIS released Items
  - b. Missouri Assessment Program released items
  - c. Chemical Concepts Inventory
2. Safety Issues in Chemistry Teaching
  - a. Missouri Secondary Science Safety Manual (MO-DESE) and NSTA safety standards
  - b. Materials Safety Data Sheets and Right-to-Know Laws
  - c. Chemical handling, storage, and disposal issues
  - d. Safety contracts and other liability issues
  - e. Resources for safety issues (MO-DNR and Dept. of Conservation, ACS, periodicals)
3. Other Management Issues for the Chemistry Laboratory
  - a. Chemicals and materials preparation and planning
  - b. Ordering supplies and budgets
  - c. Physical facilities for laboratory
4. Types of Chemistry Investigation
  - a. Verification experiments
  - b. Guided and open inquiry (discovery) experiments
  - c. Microscale experiments
  - d. Interdisciplinary and/or extended time frame projects (science contests)
5. Technology Usage in Chemistry Teaching
  - a. Automated data collection in the lab (Pasco and Vernier Science Probes)
  - b. Data analysis (spreadsheets such as LoggerPro or Excel)
  - c. Web page utilization
  - d. Presentation software and multimedia
6. Assessment issues in the Chemistry Laboratory
  - a. Formal and informal assessment in the laboratory
  - b. Rubric/scoring guide design and usage for lab reports
  - c. Laboratory notebooks
  - d. Science projects
7. Practical (authentic) experiences
  - a. Science Olympiad (planning/preparation, supervising, assessing/judging)
  - b. Chemistry laboratory/classroom observation and teaching (mini-lesson)
8. Utilization of literature and curriculum resources
  - a. Identify at least 2 laboratory activities from multiple sources and which utilize distinctly different laboratory instructional/investigative approaches.
  - b. Students will choose an activity from (a), plan and prepare for its implementation including student directions, teacher preparation and safety considerations, materials list, and scoring guide. The activity is to be aligned with national science education standards. They then must peer teach this project to members of the CHM435/635 class. (This is the Final Project.)
9. Professional Development (discussion of being a lifelong learner as a practicing teacher). Guest speaker

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**Missouri State.**

**Curricular Action Workflow**



Missouri State > Computer Services - MIS > Curricular Action Workflow > CAW - Change Course Proposal Form

# Change Course Proposal Form

Submitted on 10/08/2015 by G Schick ([AlanSchick@MissouriState.edu](mailto:AlanSchick@MissouriState.edu)).

\*All fields require input

This proposal applies to:

An existing COURSE

An existing REGULAR (e.g. permanent) SECTION of a variable content course.

Existing Course:

CHM735 Invest In Chem for Teachers

Is this a general education course?  No  Yes

Will this course affect professional education and need to be reviewed by EPPC?  No  Yes

Current online catalog description:

CHM 735 Invest in Chem for Teachers

Prerequisite: coursework sufficient to meet Missouri certification standards for secondary/middle school science teaching. Techniques in performing science investigation with application to secondary and middle school science. May be taught concurrently with CHM 435. Cannot receive credit for both CHM 435 and CHM 735. 3(1-4) SO

Revise the current online catalog description as needed:

CHM 735 Special Project in Chem for Teachers

Prerequisite: coursework sufficient to meet Missouri certification standards for secondary/middle school science teaching. Prerequisite or Corequisite: CHM 635. Classroom Integration project with application to secondary and middle school science. 2(0-4) SO

What is changing? Check all boxes that apply.

Course Code  Course Number (Check Availability)  Title  Prerequisite



Credit Hours/Contact Hours     Periodicity     Description

Reason for proposed change

For HLC compliance, CHM 735 cannot parallel a 400-level (undergraduate) course as it currently does in part with CHM 435. Our plan is to split CHM 735 into two components: CHM 635, which will parallel the existing CHM 435 (1 credit) and a modified CHM 735 (for graduates only) that entails a special project. Thus, there are two separate Course Change proposals being submitted: This one for a 2-credit modified version of CHM 735, and a separate one for the 1-credit CHM 635.

Does this change affect course assessment?  No  Yes

How did you determine the need for this change? Check all boxes that apply or specify other.

- Routine or annual review/assessment of curriculum
- Faculty Input
- Student Input
- Accreditation/certification compliance
- Review of catalog information
- Other (be specific):

Check if this is a non-substantive change.

What is the date that this course change was approved by departmental or program faculty? (MM/DD/YYYY)

10/06/2015

Current Status:

Grad Council Review

Proposal Progress:

10/13/2015 - Department Head Review - Bryan Breyfogle - Approved

10/13/2015 - Dean Review - Tamera Jahnke - Reviewed

Review Comments:

No comments have been added to this proposal.





**Missouri State.**

**Curricular Action Workflow**



Missouri State > Computer Services - MIS > Curricular Action Workflow > CAW - Change Course Proposal Form

## Change Course Proposal Form

Submitted on 10/08/2015 by G Schick ([AlanSchick@MissouriState.edu](mailto:AlanSchick@MissouriState.edu)).

**\*All fields require input**

This proposal applies to:

An existing COURSE

An existing REGULAR (e.g. permanent) SECTION of a variable content course.

Existing Course:

CHM760 Chm of Envir Systms:Water&Land

Is this a general education course?  No  Yes

Will this course affect professional education and need to be reviewed by EPPC?  No  Yes

Current online catalog description:

CHM 760 Chm of Envir Systms:Water&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

Revise the current online catalog description as needed:

CHM 660 Chm of Envir Systms:Water&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 660. 3(3-0) F

What is changing? Check all boxes that apply.

Course Code

Course Number (Check Availability)

Title

Prerequisite

6

Credit Hours/Contact Hours     Periodicity     Description

Reason for proposed change

HLC Compliance: 700-level courses cannot parallel 400-level courses, so we are changing this course to become a 600-level course.

Does this change affect course assessment?  No     Yes

How did you determine the need for this change? Check all boxes that apply or specify other.

- Routine or annual review/assessment of curriculum
- Accreditation/certification compliance
- Other (be specific):
- Faculty Input
- Student Input
- Review of catalog information

Check if this is a non-substantive change. **i**

What is the date that this course change was approved by departmental or program faculty? (MM/DD/YYYY)    10/06/2015

Current Status:

Grad Council Review

Proposal Progress:

10/13/2015 - Department Head Review - Bryan Breyfogle - Approved  
10/13/2015 - Dean Review - Tamera Jahnke - Reviewed

Review Comments:

No comments have been added to this proposal.





**Missouri State.**

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**Curricular Action Workflow**

Missouri State &gt; Computer Services - MIS &gt; Curricular Action Workflow &gt; CAW - Change Course Proposal Form

## Change Course Proposal Form

Submitted on 10/08/2015 by G Schick ([AlanSchick@MissouriState.edu](mailto:AlanSchick@MissouriState.edu)).**\*All fields require input**

This proposal applies to:

 An existing COURSE An existing REGULAR (e.g. permanent) SECTION of a variable content course.

Existing Course:

CHM761 Chm of Eviron Sys:Air &amp; Energy

Is this a general education course?  No  YesWill this course affect professional education and need to be reviewed by EPPC?  No  Yes

Current online catalog description:

CHM 761 Chm of Eviron Sys:Air &amp; 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

Revise the current online catalog description as needed:

CHM 661 Chm of Eviron Sys:Air &amp; 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 661 and CHM 461. 3(3-0) S

What is changing? Check all boxes that apply.

 Course Code       Course Number (**Check Availability**)       Title       Prerequisite



Credit Hours/Contact Hours     Periodicity     Description

Reason for proposed change

HLC Compliance: 700-level courses cannot parallel 400-level courses, so we are changing this course to become a 600-level course.

Does this change affect course assessment?  No     Yes

How did you determine the need for this change? Check all boxes that apply or specify other.

- Routine or annual review/assessment of curriculum
- Accreditation/certification compliance
- Other (be specific):
- Faculty Input
- Student Input
- Review of catalog information

Check if this is a non-substantive change.

What is the date that this course change was approved by departmental or program faculty? (MM/DD/YYYY)

10/06/2015

Current Status:

Grad Council Review

Proposal Progress:

10/13/2015 - Department Head Review - Bryan Breyfogle - Approved

10/13/2015 - Dean Review - Tamera Jahnke - Reviewed

Review Comments:

No comments have been added to this proposal.



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**Missouri State.****Curricular Action Workflow**

Missouri State &gt; Computer Services - MIS &gt; Curricular Action Workflow &gt; CAW - Change Course Proposal Form

## Change Course Proposal Form

Submitted on 10/08/2015 by G Schick ([AlanSchick@MissouriState.edu](mailto:AlanSchick@MissouriState.edu)).**\*All fields require input**

This proposal applies to:

 An existing COURSE An existing REGULAR (e.g. permanent) SECTION of a variable content course.

Existing Course:

CHM762 Chem of Enviro Systems Lab

Is this a general education course?  No  YesWill this course affect professional education and need to be reviewed by EPPC?  No  Yes

Current online catalog description:

CHM 762 Chem of Enviro Systems Lab

Prerequisite: CHM 760 or concurrent enrollment. Techniques and procedures for environmental monitoring to test natural samples. Applications and limitations of wet chemical and instrumental methods such as atomic absorption, gas chromatography, and absorption spectrophotometry. May be taught concurrently with CHM 462. Cannot receive credit for both CHM 462 and CHM 762. 2(0-4) S

Revise the current online catalog description as needed:

CHM 662 Chem of Enviro Systems Lab

Prerequisite: CHM 760 or concurrent enrollment. Techniques and procedures for environmental monitoring to test natural samples. Applications and limitations of wet chemical and instrumental methods such as atomic absorption, gas chromatography, and absorption spectrophotometry. May be taught concurrently with CHM 462. Cannot receive credit for both CHM 462 and CHM 662. 2(0-4) S

What is changing? Check all boxes that apply.



<input type="checkbox"/> Course Code	<input type="checkbox"/> Course Number (Check Availability)	<input type="checkbox"/> Title	<input type="checkbox"/> Prerequisite
<input type="checkbox"/> Credit Hours/Contact Hours	<input type="checkbox"/> Periodicity	<input type="checkbox"/> Description	

Reason for proposed change

HLC Compliance: 700-level courses cannot parallel 400-level courses, so we are changing this course to become a 600-level course.

Does this change affect course assessment?  No  Yes

How did you determine the need for this change? Check all boxes that apply or specify other.

- Routine or annual review/assessment of curriculum
- Faculty Input
- Student Input
- Accreditation/certification compliance
- Review of catalog information
- Other (be specific):

Check if this is a non-substantive change.

What is the date that this course change was approved by departmental or program faculty? (MM/DD/YYYY)

10/06/2015

Current Status:

Grad Council Review

Proposal Progress:

10/13/2015 - Department Head Review - Bryan Breyfogle - Approved  
10/13/2015 - Dean Review - Tamera Jahnke - Reviewed

Review Comments:

10/13/2015 - Dean Review - Tamera Jahnke - None There is a typo in the prerequisite. You either need to delete "CHM760 or concurrent enrollment" or change it to something else. - T. Jahnke



**Missouri State.**

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**Curricular Action Workflow**



Missouri State > Computer Services - MIS > Curricular Action Workflow > CAW - New Course Proposal Form

# New Course Proposal Form

Submitted on 10/03/2015 by Kevin Mickus ([Kevinmickus@missouristate.edu](mailto:Kevinmickus@missouristate.edu)).

\*All fields require input

New COURSE

New REGULAR PERMANENT SECTION of an existing variable content course. If a new regular section of an existing variable topics course, enter the existing course number below

Course Code:

GLG

Course Number: (Check Availability)

591

Course Title:

Seismic Data Processing

Will this course affect professional education and need to be reviewed by EPPC?  No  Yes

Prerequisite/Co-requisite or enter 'None':

340 (or permission); and either PHY 124 or PHY 204 (or concurrent enrollment in either); and either MTH 280 or MTH 288 (or concurrent enro

General Course Description: (Include any Pass/Not Pass grading restrictions, repeatable limits, limitation on course applicability, UG/GR parallel course, etc.)

The basic techniques to process seismic reflection data as used by for tectonic, oil, environmental and mining applications. Techniques include deconvolution, filtering, migration, stacking, normal moveout corrections. Basic seismic reflection interpretation will be addressed. This is a computer based class.

Cannot receive credit for both 591 and 691. This is a UG/GR course

Credit Hours:

3

Lecture Contact Hours:

2

Lab Contact Hours:

2

Note: If variable credit, enter the highest number and add to end of course description. (e.g. "Variable credit, may be taken 1-3 hours.")

Periodicity. Check all that apply.



Fall



Fall (even-numbered years only)



Fall (odd-numbered years only)

- Spring
- Spring (even-numbered years only)
- Spring (odd-numbered years only)
- Summer
- On Demand only

9

**Complete Catalog Description:**

GLG 591 Seismic Data Processing

Prerequisite: 340 (or permission); and either PHY 124 or PHY 204 (or concurrent enrollment in either); and either MTH 280 or MTH 288 (or concurrent enrollment in either)

The basic techniques to process seismic reflection data as used by for tectonic, oil, environmental and mining applications. Techniques include-deconvolution, filtering, migration, stacking, normal moveout corrections. Basic seismic reflection interpretation will be addressed. This is a computer based class. Cannot receive credit for both 591 and 691. This is a UG/GR course

Credit hours: 3 Lecture contact hours: 2 Lab contact hours: 2

Typically offered: Spring (even-numbered years only)

Include sample syllabus (list topics, course goals.) Use text box OR upload only file types of PDF, DOC or DOCX.

A sample syllabus has been attached [View](#)

**Purpose of Course**

This course will teach the students the basic methods of processing seismic reflection data. This is the most common type of geophysical data used in Earth Sciences. It is used for tectonic, petroleum, environmental and mining studies. It is the most common method to explore for petroleum and a large number of our students work in the petroleum industry. All students using seismic reflection data must know how the data are processed. Also, the basic seismic reflection interpretation techniques will be presented with the new software donated by petroleum companies.

**Relationship to Other Departments**

This course could be taken by other disciplines that use geophysical data such as Archaeology, Physics and Material Sciences, and Civil Engineering

Is there a graduate/undergraduate parallel course to this one?  No  Yes

**New Course Resource Information**

Anticipated Average Enrollment per section:	15	Maximum Enrollment Limit per section:	20
Anticipated Average Enrollment per semester:	15	Maximum Enrollment Limit per semester:	20
Anticipated Average Enrollment per year:	15	Maximum Enrollment Limit per year:	20
Faculty Load Assignment (equated hours):	4		

Is another course being deleted?  No  Yes

9

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

Additional faculty; regular vs per-course

none

Other additional expenses

none

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

1

List names of current faculty qualified and available to teach this course

9

Kevin Mickus

What is the anticipated source of students for this course?

Geology undergraduate students, archaeology, civil engineering and Physics and Material Sciences

If from within the department, will students be taking this course in addition to or in place of other courses?

Geology students will take the class as an elective but it will be part of our requirement that they have to take 1 calculus based course currently where there are three courses available

If from outside the department, which courses in other departments would most likely be affected?

None, there are no geophysics type courses in the other departments

Other comments:

There will be a graduate version of this course, GLG 691, they will have to write a term paper on the application of seismic data processing to solve some type of geological problem

What is the date that this new course was approved by departmental or program faculty? (MM/DD/YYYY)

10/01/2015

**Current Status:**

College Council Review

**Proposal Progress:**

10/23/2015 - Department Head Review - Toby Dogwiler - Approved

**Review Comments:**

No comments have been added to this proposal.





**POLICY STATEMENT**

**GEOLOGY**

**DEPARTMENT OF GEOGRAPHY,  
GEOLOGY & PLANNING**

**GLG 591/691** – Seismic Data Processing  
TTH: 6:00-7:50  
Temple 335

Dr. Kevin Mickus  
Temple 375A-Office  
Temple 355 - Lab

**OFFICE HOURS:** TTH 1:00-2:00, F 2:00-5:00  
**OFFICE PHONE:** 836-6375  
**Email:** kevinmickus@missouristate.edu

**Spring 2016**

**CATALOG DESCRIPTION:**

**GLG 591/691, Seismic Data Processing 3 (2-2)**

GLG 340 (or permission); and either PHY 124 or PHY 204 (or concurrent enrollment in either); and either MTH 280 or MTH 288 (or concurrent enrollment in either). The basic techniques to process seismic reflection data as used by for tectonic, oil, environmental and mining applications. Techniques include-deconvolution, filtering, migration, stacking, normal moveout corrections. Basic seismic reflection interpretation will be addressed. This is a computer based class. Cannot receive credit for both 591 and 691.

**REQUIRED TEXTBOOK:**

**None**-I will hand out papers during class.

**Supplemental Reading: These are available in the library**

Yilmaz, Oz, 2001, *Seismic Data Analysis: Processing, Inversion, and Interpretation of Seismic Data*, Investigations in Geophysics 10, Society of Exploration Geophysicists.

Ikelle, Luc T., and Amundsen, Lasse, 2005, *Introduction to Petroleum Seismology*, Investigations in Geophysics 12, Society of Exploration Geophysicists.

Christopher L. Liner, 2004, *Elements of 3D Seismology. 2nd Edition*. PennWell.

**COURSE OBJECTIVES:**

After taking this course, students should be able to understand the basic techniques in which seismic reflection data are collected and processed into a form that can be used for interpretation of the geologic structures in the subsurface.

**COURSE REQUIREMENTS:**

**DROPPING THE COURSE:** 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.

Faculty may also wish to include relevant drop deadlines. See Academic Calendars ([www.missouristate.edu/registrar/acad\\_cal.html](http://www.missouristate.edu/registrar/acad_cal.html)) for deadlines.

**MAKE-UP POLICY:** If you know in advance that you must miss a test for a good reason (i.e. court appearance, trip with an athletic team, etc.) it may be possible for you to take the test in advance (please note: this is not an iron clad guarantee of taking an exam early, you must have a good reason; wanted to leave town a day or two early to extend your thanksgiving vacation is not considered a good reason). In this case, you must see me well in advance (one week) and be prepared to substantiate your reason for missing the scheduled test. There will be **absolutely no make-up tests** given after the fact. **NOBODY CAN TAKE THE FINAL EARLY.**

**EXTRA CREDIT WORK:** There is no extra credit work allowed in this class, please do not ask.

**GRADES:**

**EXAMS:** There will be two exams covering the material covered in the class. The questions will consist of short answers.

**WRITING ASSIGNMENTS:** Writing assignments will be given on readings handed out in class. Assignments will consist of reviewing the articles and answering specific questions. The writings will be graded based on clarity, spelling, English grammar, analysis of the given article, and originality. The writings will due one week after they are handed out. Assignments turned in one day late will be penalized by 50%, after one week no points will be given for that assignment.

**HOMEWORK:** The majority of the course will consist of computer exercises. Twelve exercises will be given during the semester. Additionally, other homework assignments may be given which involve solving problems.

**GRADING:** Your grade will depend on the exams and the homework/writing assignments. Each will be worth 50% (Exam 1- 25%, Exam 2-25%, homework/writing assignments-50%). Each homework/writing assignment is due 1 week after it is assigned. If up to one week late, it is worth 50%. After one week, forget about turning it in. Each homework will be worth 10 points.

**Please keep track of all your grades, so that you can figure out your grade any time you wish. I will not figure your grade for you during the semester.**

## GENERAL MATERIAL

### ATTENDANCE POLICY

Attendance will not be used in determining grades. On the first day of class, faculty must provide students with a written statement of the specific attendance policy for that class. The instructor has the responsibility to determine specific attendance policies for each course taught, including the role that attendance plays in calculation of final grades and the extent to which work missed due to non-attendance can be made up. For GLG 171, attendance will be taken but will be counted against your grade. **Instructors are not allowed to let students use their lecture notes.**

**If the student is physically absent from the class or part of it, the student is absent on the record.** Explanation of an absence and acceptance thereof by the instructor shall not be construed to excuse the student from any work or test. **ADDITIONALLY, THE USE OF A CELL PHONE IN CLASS FOR ANY REASON (TEXTING, TALKING OR JUST LOOKING AT IT FOR TEXTS) WILL CAUSE YOU TO LOSE YOUR ATTENDANCE FOR THAT DAY. ADDITIONALLY, IF YOU ARE USING A COMPUTER TO TAKE NOTES, ANY WEB BROWSER MUST BE SHUT DOWN, IF NOT, YOU WILL LOSE YOUR ATTENDANCE FOR THAT DAY.**

**THE PERCENTAGE ATTENDANCE IS NOT A REQUIRED PART OF YOUR GRADE,** so any excuse (school or nonschool event) will allow you to count the absence as being in class. Your percentage attendance will substitute your lowest grade (out of exams 1-4) if it benefits you. You can consider this as a "bonus" for good attendance.

### AUDIO AND VIDEO RECORDING COURSE ACTIVITY

Students may make audio or video recordings of course activity. However, the redistribution of audio or video recordings from the course to individuals who are not students in the class is prohibited without the express permission of the faculty member and any of the students who are recorded.

### RELIGIOUS ACCOMMODATION

The University may provide a reasonable accommodation based on a person's sincerely held religious belief. In making this determination, the University reviews a variety of factors, including whether the accommodation would create an undue hardship. The accommodation request imposes responsibilities and obligations on both the individual requesting the accommodation and the University. Students who expect to miss classes, examinations, or other assignments as a consequence of their sincerely held religious belief shall be provided with a reasonable alternative opportunity to complete such academic responsibilities. It is the obligation of students to provide faculty with reasonable notice of the dates of religious observances on which they will be absent by submitting a *Request for Religious Accommodation Form* to the instructor by the end of the third week of a full semester course or the end of the second week of a half semester course.

## DISABLED STUDENTS

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](http://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>

## 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 Institutional Equity and Compliance, 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/](http://www.missouristate.edu/equity/).

## EMERGENCY RESPONSE PLAN

At the first class meeting, students should become familiar with a basic emergency response plan through a dialogue with the instructor that includes a review and awareness of exits specific to the classroom and the location of evacuation centers for the building. All instructors are provided this information specific to their classroom and/or lab assignments in an e-mail prior to the beginning of the fall semester from the Office of the Provost and Safety and Transportation. Students with disabilities impacting mobility should discuss the approved accommodations for emergency situations and additional options when applicable with the instructor. For more information go to <http://www.missouristate.edu/safetran/51597.htm> and <http://www.missouristate.edu/safetran/erp.htm>.

## ACADEMIC DISHONESTY

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](#) 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.

## AFFIRMATIVE ACTION 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 of Equity and Diversity, Siceluff Hall 296, (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, Dr. Thomas Plymate [tomplymate@missouristate.edu](mailto:tomplymate@missouristate.edu).

## **DISABILITY ACCOMMODATION**

To request academic accommodations for a disability, contact the Director of the Disability Resource Center, Carrington Hall, Room 302, 417-836-4192 or 417-836-6792 (TTY), [www.missouristate.edu/disability](http://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>.

## **POLICY ON USE OF CELL PHONES IN CLASSES**

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.

## **STUDENT RESPONSIBILITIES**

**Obtaining Notes/Handouts for Missed Lectures:** If you miss a lecture, it is your responsibility to obtain notes/handouts from some other class member. Professors are not allowed to distribute copies of their notes to students, or to offer personalized make-up tutorials, so please do not ask.

**Seeking Extra Help:** It is your responsibility to seek additional help in understanding the course material before irreparable damage is done. I am happy to answer your questions and provide additional help during my office hours or any other mutually convenient time. However, it is your responsibility to prepare for this additional help by thoroughly reading the assigned material and carefully reviewing class notes before going to my office so that you can ask specific questions on the material which has not been understood. If I ask "What don't you understand?" and you answer "Everything", then you have not prepared adequately to take advantage of the additional help.

**Class Disruptions:** It is easy for an individual to disrupt and disturb a large number of people. Instructors at MSU have authority to suspend or drop any student who disrupts a class. Examples of disruptions include: 1) excessive talking or joking during class; 2) consistently

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arriving late for class; 3) leaving class early (without notifying the instructor); 4) texting or using a cell phone and 5) rustling of papers, books etc.

**PROBLEMS:** If you foresee or experience any problems during the course, please come and see me **as early as possible**. I am easy to reach by phone or by e-mail. If you cannot get a hold of me, please contact our secretary at 836-5800. She will be able to find me.

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**TENTATIVE LECTURE AND EXAM SCHEDULE GLG 597-697**  
**(subject to change, which will be announced in class)**

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<b>LECTURE</b>	<b>Approximate number of lectures</b>
Introduction to Course	1
General Seismology	3
Basic processing-preparing seismic data	4
Velocity analysis	4
Normal Movement, Stacking	2
Editing	2
Deconvolution, Filtering	4
Statics	4
More Stacking	2
Migration	2
Basic Reflection Seismic Interpretation	1

**FINAL EXAM TUESDAY, DECEMBER 13, 8:00-10:00 pm**

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Missouri State

Curricular Action Workflow



Missouri State &gt; Computer Services - MIS &gt; Curricular Action Workflow &gt; CAW - New Course Proposal Form

## New Course Proposal Form

Submitted on 10/03/2015 by Kevin Mickus ([Kevinmickus@missouristate.edu](mailto:Kevinmickus@missouristate.edu)).

\*All fields require input

 New COURSE

New REGULAR PERMANENT SECTION of an existing variable content course. If a new regular section of an existing variable topics course, enter the existing course number below

Course Code:

GLG

Course Number: (Check Availability)

691

Course Title:

Seismic Data Processing

Will this course affect professional education and need to be reviewed by EPPC?  No  Yes

Prerequisite/Co-requisite or enter 'None':

340 (or permission); and either PHY 124 or PHY 204 (or concurrent enrollment in either); and either MTH 280 or MTH 288 (or concurrent enro

General Course Description: (Include any Pass/Not Pass grading restrictions, repeatable limits, limitation on course applicability, UG/GR parallel course, etc.)

The basic techniques to process seismic reflection data as used by for tectonic, oil, environmental and mining applications. Techniques include-deconvolution, filtering, migration, stacking, normal moveout corrections. Basic seismic reflection interpretation will be addressed. This is a computer based class.

Cannot receive credit for both 591 and 691. This is a UG/GR course

Credit Hours:

3

Lecture Contact Hours:

2

Lab Contact Hours:

2

Note: If variable credit, enter the highest number and add to end of course description. (e.g. "Variable credit, may be taken 1-3 hours.")

Periodicity. Check all that apply.

 Fall Fall (even-numbered years only) Fall (odd-numbered years only)



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- Spring  Spring (even-numbered years only)  Spring (odd-numbered years only)
- Summer  On Demand only

**Complete Catalog Description:**

GLG 691 Seismic Data Processing

Prerequisite: 340 (or permission); and either PHY 124 or PHY 204 (or concurrent enrollment in either); and either MTH 280 or MTH 288 (or concurrent enrollment in either)

The basic techniques to process seismic reflection data as used by for tectonic, oil, environmental and mining applications. Techniques include-deconvolution, filtering, migration, stacking, normal moveout corrections. Basic seismic reflection interpretation will be addressed. This is a computer based class. Cannot receive credit for both 591 and 691. This is a UG/GR course

Credit hours: 3 Lecture contact hours: 2 Lab contact hours: 2

Typically offered: Spring, Spring (even-numbered years only)

Include sample syllabus (list topics, course goals.) Use text box OR upload only file types of PDF, DOC or DOCX.

A sample syllabus has been attached [View](#)

**Purpose of Course**

This course will teach the students the basic methods of processing seismic reflection data. This is the most common type of geophysical data used in Earth Sciences. It is used for tectonic, petroleum, environmental and mining studies. It is the most common method to explore for petroleum and a large number of our students work in the petroleum industry. All students using seismic reflection data must know how the data are processed. Also, the basic seismic reflection interpretation techniques will be presented with the new software donated by petroleum companies.

**Relationship to Other Departments**

This course could be taken by other disciplines that use geophysical data such as Archaeology, Physics and Material Sciences, and Civil Engineering

Is there a graduate/undergraduate parallel course to this one?  No  Yes

**New Course Resource Information**

Anticipated Average Enrollment per section:	15	Maximum Enrollment Limit per section:	20
Anticipated Average Enrollment per semester:	15	Maximum Enrollment Limit per semester:	20
Anticipated Average Enrollment per year:	15	Maximum Enrollment Limit per year:	20
Faculty Load Assignment (equated hours):	4		

Is another course being deleted?  No  Yes

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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

Additional faculty; regular vs per-course

none

Other additional expenses

none

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

1

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List names of current faculty qualified and available to teach this course

Kevin Mickus

What is the anticipated source of students for this course?

graduate students in Geology, archaeology, and Physics and Material Sciences

If from within the department, will students be taking this course in addition to or in place of other courses?

This will be an elective course for graduate students

If from outside the department, which courses in other departments would most likely be affected?

None, there are no geophysics type courses in the other departments

Other comments:

I am proposing this course have an undergrad prefix 591

What is the date that this new course was approved by departmental or program faculty? (MM/DD/YYYY)

10/01/2015

**Current Status:**

Grad Council Review

**Proposal Progress:**

10/23/2015 - Department Head Review - Toby Dogwiler - Approved

10/26/2015 - Dean Review - Tamera Jahnke - Reviewed

**Review Comments:**

No comments have been added to this proposal.



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## POLICY STATEMENT

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### GEOLOGY

### DEPARTMENT OF GEOGRAPHY, GEOLOGY & PLANNING

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**GLG 691** – Seismic Data Processing  
TTH: 6:00-7:50  
Temple 335

Dr. Kevin Mickus  
Temple 375A-Office  
Temple 355 - Lab

**OFFICE HOURS:** TTH 1:00-2:00, F 2:00-5:00

**Spring 2016**

**OFFICE PHONE:** 836-6375

**Email:** kevinmickus@missouristate.edu

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### CATALOG DESCRIPTION:

#### **GLG 691, Seismic Data Processing 3 (2-2)**

GLG 340 (or permission); and either PHY 124 or PHY 204 (or concurrent enrollment in either); and either MTH 280 or MTH 288 (or concurrent enrollment in either). The basic techniques to process seismic reflection data as used by for tectonic, oil, environmental and mining applications. Techniques include-deconvolution, filtering, migration, stacking, normal moveout corrections. Basic seismic reflection interpretation will be addressed. This is a computer based class. Cannot receive credit for both 591 and 691.

### REQUIRED TEXTBOOK:

**None**-I will hand out papers during class.

#### **Supplemental Reading: These are available in the library**

Yilmaz, Oz, 2001, *Seismic Data Analysis: Processing, Inversion, and Interpretation of Seismic Data*, Investigations in Geophysics 10, Society of Exploration Geophysicists.

Ikelle, Luc T., and Amundsen, Lasse, 2005, *Introduction to Petroleum Seismology*, Investigations in Geophysics 12, Society of Exploration Geophysicists.

Christopher L. Liner, 2004, *Elements of 3D Seismology. 2nd Edition*. PennWell.

### COURSE OBJECTIVES:

After taking this course, students should be able to understand the basic techniques in which seismic reflection data are collected and processed into a form that can be used for interpretation of the geologic structures in the subsurface.

**COURSE REQUIREMENTS:**

**DROPPING THE COURSE:** 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.

Faculty may also wish to include relevant drop deadlines. See Academic Calendars ([www.missouristate.edu/registrar/acad\\_cal.html](http://www.missouristate.edu/registrar/acad_cal.html)) for deadlines.

**MAKE-UP POLICY:** If you know in advance that you must miss a test for a good reason (i.e. court appearance, trip with an athletic team, etc.) it may be possible for you to take the test in advance (please note: this is not an iron clad guarantee of taking an exam early, you must have a good reason; wanted to leave town a day or two early to extend your thanksgiving vacation is not considered a good reason). In this case, you must see me well in advance (one week) and be prepared to substantiate your reason for missing the scheduled test. There will be **absolutely no make-up tests** given after the fact. **NOBODY CAN TAKE THE FINAL EARLY.**

**EXTRA CREDIT WORK:** There is no extra credit work allowed in this class, please do not ask.

**GRADES:**

**EXAMS:** There will be two exams covering the material covered in the class. The questions will consist of short answers.

**WRITING ASSIGNMENTS:** Writing assignments will be given on readings handed out in class. Assignments will consist of reviewing the articles and answering specific questions. The writings will be graded based on clarity, spelling, English grammar, analysis of the given article, and originality. The writings will due one week after they are handed out. Assignments turned in one day late will be penalized by 50%, after one week no points will be given for that assignment.

**HOMEWORK:** The majority of the course will consist of computer exercises. Twelve exercises will be given during the semester. Additionally, other homework assignments may be given which involve solving problems.

**TERM PAPER:** A 10 page paper on the review of one or more research articles that processed and interpreted seismic reflection data to solve one or more types of geological problems.

**GRADING:** Your grade will depend on the exams and the homework/writing assignments. Each will be worth 50% (Exam 1- 25%, Exam 2-25%, homework/writing assignments-50%). Each homework/writing assignment is due 1 week after it is assigned. If up to one week late, it is worth 50%. After one week, forget about turning it in. Each homework will be worth 10 points.

Please keep track of all your grades, so that you can figure out your grade any time you wish. I will not figure your grade for you during the semester.

**GENERAL MATERIAL**

**ATTENDANCE POLICY**

Attendance will not be used in determining grades. On the first day of class, faculty must provide students with a written statement of the specific attendance policy for that class. The instructor has the responsibility to determine specific attendance policies for each course taught, including the role that attendance plays in calculation of final grades and the extent to which work missed due to non-attendance can be made up. For GLG 171, attendance will be taken but will be counted against your grade. **Instructors are not allowed to let students use their lecture notes.**

**If the student is physically absent from the class or part of it, the student is absent on the record.** Explanation of an absence and acceptance thereof by the instructor shall not be construed to excuse the student from any work or test. **ADDITIONALLY, THE USE OF A CELL PHONE IN CLASS FOR ANY REASON (TEXTING, TALKING OR JUST LOOKING AT IT FOR TEXTS) WILL CAUSE YOU TO LOSE YOUR ATTENDANCE FOR THAT DAY. ADDITIONALLY, IF YOU ARE USING A COMPUTER TO TAKE NOTES, ANY WEB BROWSER MUST BE SHUT DOWN, IF NOT, YOU WILL LOSE YOUR ATTENDANCE FOR THAT DAY.**

**THE PERCENTAGE ATTENDANCE IS NOT A REQUIRED PART OF YOUR GRADE,** so any excuse (school or nonschool event) will allow you to count the absence as being in class. Your percentage attendance will substitute your lowest grade (out of exams 1-4) if it benefits you. You can consider this as a "bonus" for good attendance.

**AUDIO AND VIDEO RECORDING COURSE ACTIVITY**

Students may make audio or video recordings of course activity. However, the redistribution of audio or video recordings from the course to individuals who are not students in the class is prohibited without the express permission of the faculty member and any of the students who are recorded.

**RELIGIOUS ACCOMMODATION**

The University may provide a reasonable accommodation based on a person's sincerely held religious belief. In making this determination, the University reviews a variety of factors, including whether the accommodation would create an undue hardship. The accommodation request imposes responsibilities and obligations on both the individual requesting the accommodation and the University. Students who expect to miss classes, examinations, or other assignments as a consequence of their sincerely held religious belief shall be provided with a reasonable alternative opportunity to complete such academic responsibilities. It is the obligation of students to provide faculty with reasonable notice of the dates of religious observances on which they will be absent by submitting a *Request for Religious*

*Accommodation Form* to the instructor by the end of the third week of a full semester course or the end of the second week of a half semester course.

**DISABLED STUDENTS**

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](http://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>

**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 Institutional Equity and Compliance, 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/](http://www.missouristate.edu/equity/).

**EMERGENCY RESPONSE PLAN**

At the first class meeting, students should become familiar with a basic emergency response plan through a dialogue with the instructor that includes a review and awareness of exits specific to the classroom and the location of evacuation centers for the building. All instructors are provided this information specific to their classroom and/or lab assignments in an e-mail prior to the beginning of the fall semester from the Office of the Provost and Safety and Transportation. Students with disabilities impacting mobility should discuss the approved accommodations for emergency situations and additional options when applicable with the instructor. For more information go to <http://www.missouristate.edu/safetran/51597.htm> and <http://www.missouristate.edu/safetran/erp.htm>.

**ACADEMIC DISHONESTY**

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 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.

**AFFIRMATIVE ACTION 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 of Equity and Diversity, Siceluff Hall 296, (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, Dr. Thomas Plymate [tomplymate@missouristate.edu](mailto:tomplymate@missouristate.edu).

## **DISABILITY ACCOMMODATION**

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## **POLICY ON USE OF CELL PHONES IN CLASSES**

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.

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**Class Disruptions:** It is easy for an individual to disrupt and disturb a large number of people.



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Instructors at MSU have authority to suspend or drop any student who disrupts a class. Examples of disruptions include: 1) excessive talking or joking during class; 2) consistently arriving late for class; 3) leaving class early (without notifying the instructor); 4) texting or using a cell phone and 5) rustling of papers, books etc.

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9

**TENTATIVE LECTURE AND EXAM SCHEDULE GLG 597-697**  
**(subject to change, which will be announced in class)**

---

<b>LECTURE</b>	<b>Approximate number of lectures</b>
Introduction to Course	1
General Seismology	3
Basic processing-preparing seismic data	4
Velocity analysis	4
Normal Movement, Stacking	2
Editing	2
Deconvolution, Filtering	4
Statics	4
More Stacking	2
Migration	2
Basic Reflection Seismic Interpretation	1

**FINAL EXAM TUESDAY, DECEMBER 13, 8:00-10:00 pm**

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Missouri State.

Curricular Action Workflow



Missouri State > Computer Services - MIS > Curricular Action Workflow > CAW - Change Course Proposal Form

# Change Course Proposal Form

Submitted on 09/29/2015 by Rajinder Jutla ([Rajinderjutla@missouristate.edu](mailto:Rajinderjutla@missouristate.edu)).

\*All fields require input

This proposal applies to:

An existing COURSE

An existing REGULAR (e.g. permanent) SECTION of a variable content course.

Existing Course:

PLN100 Understanding Cities

Is this a general education course?  No  Yes

Will this course affect professional education and need to be reviewed by EPPC?  No  Yes

Current online catalog description:

PLN 100 Understanding Cities

Prerequisite: 12 hours. General Education Course (Focus on Public Issues). This course provides an introduction to understanding metropolitan issues from a variety of viewpoints. This course will explore questions such as: What is a city? What is the relationship between the natural and built environments? How do people perceive cities? What are their current issues and problems? How will cities respond to a changing world economy and the globalization of culture? This course will help students recognize community needs and how to contribute knowledge and work within the community to meet those needs.  
3(3-0) F,S

Revise the current online catalog description as needed:

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PLN 100 Understanding Cities

Prerequisite: 12 hours. General Education Course (Focus on Public Issues). This course provides an introduction to understanding metropolitan issues from a variety of viewpoints. It will explore questions such as: What is a city? What is the relationship between the natural and built environments? How do planners create a sustainable city? How do people perceive cities? How do planners work with diverse communities? What are their current issues and problems? How will cities respond to a changing world economy and the globalization of culture? This course will help students recognize community needs and how to contribute knowledge and work within diverse communities to meet those needs. 3(3-0) F,S

What is changing? Check all boxes that apply.

- Course Code
- Course Number (Check Availability)
- Title
- Prerequisite
- Credit Hours/Contact Hours
- Periodicity
- Description


Reason for proposed change

Updating course description

Does this change affect course assessment?  No  Yes

How did you determine the need for this change? Check all boxes that apply or specify other.

- Routine or annual review/assessment of curriculum
- Faculty Input
- Student Input
- Accreditation/certification compliance
- Review of catalog information
- Other (be specific):

Check if this is a non-substantive change. 

What is the date that this course change was approved by departmental or program faculty? (MM/DD/YYYY)

09/25/2015

Current Status:

College Council Review

Proposal Progress:

09/29/2015 - Department Head Review - Toby Dogwiler - Approved

Review Comments:

No comments have been added to this proposal.

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Missouri State

Curricular Action Workflow



Missouri State > Computer Services - MIS > Curricular Action Workflow > CAW - Change Course Proposal Form

# Change Course Proposal Form

Submitted on 09/28/2015 by Rajinder Jutla ([Rajinderjutla@missouristate.edu](mailto:Rajinderjutla@missouristate.edu)).

\*All fields require input

This proposal applies to:

An existing COURSE

An existing REGULAR (e.g. permanent) SECTION of a variable content course.

Existing Course:

PLN371 History/Introductn to Planning

Is this a general education course?  No  Yes

Will this course affect professional education and need to be reviewed by EPPC?  No  Yes

Current online catalog description:

PLN 371 History/Introductn to Planning

This course provides an introduction to planning and a critical analysis of past and present planning concepts in terms of social, economic, political, and urban design aspects. It examines the development of urban form in different eras as well as the history and forces behind the development of the planning profession in the United States. 3(3-0) F

Revise the current online catalog description as needed:

PLN 371 History/Introduction to Planning

This course provides an introduction to planning and a critical analysis of past and present planning concepts in terms of social, economic, political, and urban design aspects. It analyzes the development of urban form in different eras, and assesses its success and failure to meet the needs of diverse users. It also examines the history and forces behind the development of the planning profession in the United States. 3(3-0) F

What is changing? Check all boxes that apply.

Course Code       Course Number (Check Availability)       Title       Prerequisite

11

Credit Hours/Contact Hours     Periodicity     Description

Reason for proposed change

Updating catalog description.

Does this change affect course assessment?  No     Yes

How did you determine the need for this change? Check all boxes that apply or specify other.

- Routine or annual review/assessment of curriculum     Faculty Input     Student Input
- Accreditation/certification compliance     Review of catalog information

Other (be specific):

Check if this is a non-substantive change. **i**

What is the date that this course change was approved by departmental or program faculty? (MM/DD/YYYY)

09/25/2015

**Current Status:**

College Council Review

**Proposal Progress:**

09/29/2015 - Department Head Review - Toby Dogwiler - Approved

**Review Comments:**

No comments have been added to this proposal.



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Missouri State.

Curricular Action Workflow



Missouri State > Computer Services - MIS > Curricular Action Workflow > CAW - Change Course Proposal Form

# Change Course Proposal Form

Submitted on 09/28/2015 by Rajinder Jutla ([Rajinderjutla@missouristate.edu](mailto:Rajinderjutla@missouristate.edu)).

\*All fields require input

This proposal applies to:

An existing COURSE

An existing REGULAR (e.g. permanent) SECTION of a variable content course.

Existing Course:

PLN571 Land Use Planning

Is this a general education course?  No  Yes

Will this course affect professional education and need to be reviewed by EPPC?  No  Yes

Current online catalog description:

PLN 571 Land Use Planning

Prerequisite: PLN 371 or PLN 372 or FIN 266. Focuses on conceptual and analytical techniques of land use planning, including land use analysis, planning studies and procedures, and synthesis of planning elements through comprehensive plan development. May be taught concurrently with PLN 671. Cannot receive credit for both PLN 571 and PLN 671. 3(3-0) F

Revise the current online catalog description as needed:

PLN 571 Land Use Planning

Prerequisite: PLN 371 or PLN 372 or FIN 266.

Focuses on conceptual and analytical techniques of land use planning, including land use analysis, planning studies and procedures, and the synthesis of planning elements through comprehensive plan development. The course also explores land use planning with regard to social justice and sustainability, diverse communities, and resiliency planning. May be taught concurrently with PLN 671. Cannot receive credit for both PLN 571 and PLN 671.

What is changing? Check all boxes that apply.

Course Code  Course Number (Check Availability)  Title  Prerequisite

12

Credit Hours/Contact Hours     Periodicity     Description

Reason for proposed change

Updating course description.

Does this change affect course assessment?  No     Yes

How did you determine the need for this change? Check all boxes that apply or specify other.

- Routine or annual review/assessment of curriculum
- Faculty Input
- Student Input
- Accreditation/certification compliance
- Review of catalog information

Other (be specific):

Check if this is a non-substantive change. 

What is the date that this course change was approved by departmental or program faculty? (MM/DD/YYYY)

09/25/2015

**Current Status:**

College Council Review

**Proposal Progress:**

09/29/2015 - Department Head Review - Toby Dogwiler - Approved

**Review Comments:**

No comments have been added to this proposal.



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Missouri State.

Curricular Action Workflow



Missouri State > Computer Services - MIS > Curricular Action Workflow > CAW - Change Course Proposal Form

# Change Course Proposal Form

Submitted on 09/28/2015 by Rajinder Jutla ([Rajinderjutla@missouristate.edu](mailto:Rajinderjutla@missouristate.edu)).

\*All fields require input

This proposal applies to:

An existing COURSE

An existing REGULAR (e.g. permanent) SECTION of a variable content course.

Existing Course:

PLN572 Community Planning Practicum

Is this a general education course?  No  Yes

Will this course affect professional education and need to be reviewed by EPPC?  No  Yes

Current online catalog description:

PLN 572 Community Planning Practicum

Prerequisite: PLN 571. Focuses on the process of plan preparation and is intended to provide experience in the application of planning principles and analytical techniques learned in other program courses to an actual planning problem. Students will work on an individual basis and as part of a team in preparing a final report. Field problems will vary. May be taught concurrently with PLN 672. Cannot receive credit for both PLN 572 and PLN 672. Public Affairs Capstone Experience course. 4(3-2) S

Revise the current online catalog description as needed:

PLN 572 Community Planning Practicum

Prerequisite: PLN 571. Focuses on the process of plan preparation and is intended to provide experience in the application of planning principles and analytical techniques learned in other program courses to a planning problem in an area community. Students will work on an individual basis and as part of a team in preparing a final report. May be taught concurrently with PLN 672. Cannot receive credit for both PLN 572 and PLN 672. Public Affairs Capstone Experience course. 4(3-2) S

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What is changing? Check all boxes that apply.

- Course Code
- Course Number (Check Availability)
- Title
- Prerequisite
- Credit Hours/Contact Hours
- Periodicity
- Description

Reason for proposed change

Updating course description.

Does this change affect course assessment?  No  Yes

How did you determine the need for this change? Check all boxes that apply or specify other.

- Routine or annual review/assessment of curriculum
- Faculty Input
- Student Input
- Accreditation/certification compliance
- Review of catalog information

Other (be specific):

Check if this is a non-substantive change. **1**

What is the date that this course change was approved by departmental or program faculty? (MM/DD/YYYY)

09/25/2015

**Current Status:**

College Council Review

**Proposal Progress:**

09/29/2015 - Department Head Review - Toby Dogwiler - Approved

**Review Comments:**

No comments have been added to this proposal.



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**Missouri State.****Curricular Action Workflow**

Missouri State &gt; Computer Services - MIS &gt; Curricular Action Workflow &gt; CAW - New Course Proposal Form

## New Course Proposal Form

Submitted on 10/27/2015 by Robert Patterson ([Rspatterson@missouristate.edu](mailto:Rspatterson@missouristate.edu)).**\*All fields require input** New COURSE New REGULAR PERMANENT SECTION of an existing variable content course. If a new regular section of an existing variable topics course, enter the existing course number below

Course Code:

AST

Course Number: (Check Availability)

112

Course Title:

Life in the Universe

Is this a general education course?  No  YesWill this course affect professional education and need to be reviewed by EPPC?  No  Yes

Prerequisite/Co-requisite or enter 'None':

None

General Course Description: (Include any Pass/Not Pass grading restrictions, repeatable limits, limitation on course applicability, UG/GR parallel course, etc.)

An exploration of the prospects for life on other worlds and what that detection, or non-detection, means to humanity. Topics include the origin of elements in the Universe and how they form the building blocks of life, how conditions favorable for life can occur on planets, how life evolves, recent discoveries of exoplanets, and possible effects of the discovery of extraterrestrial life on society.

Credit Hours:

3

Lecture Contact Hours:

3

Lab Contact Hours:

0

Note: If variable credit, enter the highest number and add to end of course description. (e.g. "Variable credit, may be taken 1-3 hours.")



Periodicity. Check all that apply.

- Fall  Fall (even-numbered years only)  Fall (odd-numbered years only)
- Spring  Spring (even-numbered years only)  Spring (odd-numbered years only)
- Summer  On Demand only

**Complete Catalog Description:**

AST 112 Life in the Universe

Prerequisite: None

An exploration of the prospects for life on other worlds and what that detection, or non-detection, means to humanity. Topics include the origin of elements in the Universe and how they form the building blocks of life, how conditions favorable for life can occur on planets, how life evolves, recent discoveries of exoplanets, and possible effects of the discovery of extraterrestrial life on society.

Credit hours: 3 Lecture contact hours: 3 Lab contact hours: 0

Typically offered: Fall, Spring

Include sample syllabus (list topics, course goals.) Use text box OR upload only file types of PDF, DOC or DOCX.

A sample syllabus has been attached [View](#)

**Purpose of Course**

With thousands of planets discovered around other stars, the potential of detecting alien life (intelligent or not), and the consequences of those detections or non-detections, is something this generation will have to address. The big question "Are we alone in the Universe?" most likely will be answered within our students' lifetimes, perhaps within the next few decades. This course will inform and educate our students about this timely topic to better prepare them for the amazing discoveries ahead. AST 112, Life in the Universe, will be a modern course on a topic of active professional investigation, with material that is interdisciplinary, exciting, dynamic, and which addresses some of the oldest questions posed by human beings.

**Relationship to Other Departments**

The undergraduate course catalog lists an intersession course titled Astrobiology (BMS455), a one credit course which has not been offered in many years. AST 112 is similar, but more in-depth (3 credits), and leans more towards the astronomical impacts on evolution, possible aliens, and the human experience. This course is not required on any program. It should be of general interest to science and non-science majors alike.

Is there a graduate/undergraduate parallel course to this one?  No  Yes

**New Course Resource Information**

Anticipated Average Enrollment per section:	30	Maximum Enrollment Limit per section:	100
Anticipated Average Enrollment per semester:	30	Maximum Enrollment Limit per semester:	100
Anticipated Average Enrollment per year:	60	Maximum Enrollment Limit per year:	200

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Faculty Load Assignment (equated hours):

3

Is another course being deleted?  No  Yes

What will this course require in the way of:

Additional library Holdings

None

Additional computer resources

None. Existing computer labs are sufficient

Additional or remodeled facilities

None

Additional equipment or supplies

None

Additional travel funds

None

Additional faculty; general vs specialized

None

Additional faculty; regular vs per-course

None

Other additional expenses

None

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

The Physics, Astronomy, and Materials Science Department is adjusting its astronomy course offerings in response to the revised General Education Program. Condensing the current offerings allows for the inclusion of this new course.

List names of current faculty qualified and available to teach this course

Becky Baker, Bob Patterson, Peter Plavchan, Mike Reed

What is the anticipated source of students for this course?

Students from both within and outside the Department will take this course as an elective.

If from within the department, will students be taking this course in addition to or in place of other courses?

As an elective physics/astronomy course, in addition to required courses in the program.

If from outside the department, which courses in other departments would most likely be affected?

None currently known.

Other comments:

None

What is the date that this new course was approved by departmental or program faculty? (MM/DD/YYYY)

10/27/2015

Current Status:

College Council Review

Proposal Progress:

10/27/2015 - Department Head Review - David Cornelison - Approved

Review Comments:

No comments have been added to this proposal.

Submit and Approve



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## COURSE POLICY STATEMENT

### Department of Physics, Astronomy, & Materials Science

#### AST 112 Life in the Universe

Section: 1 Day/Time: TBD

Location: TBD

Office Hours: TBD

Instructor:

Office: Kemper 10X-Y

Phone: 836-5131

E-mail: [instructor@missouristate.edu](mailto:instructor@missouristate.edu)

Semester/Year

### CATALOG DESCRIPTION:

#### AST 112 Life in the Universe. 3 (3-0) F, S

An exploration of the prospects for life on other worlds and what that detection, or non-detection, means to humanity. Topics include the origin of elements in the Universe and how they form the building blocks of life, how conditions favorable for life can occur on planets, how life evolves, recent discoveries of exoplanets, and possible effects of the discovery of extraterrestrial life on society.

#### Required Textbook:

Bennett and Shostak, Life in the Universe 3<sup>rd</sup> Edition, Addison-Wesley, ISBN 978-0321687678

*This is the only text you will need for this course. However, this is a very dynamic and evolving area of science and so lecture notes, useful links, and other material will be posted on the web. You will also need a University-sanctioned clicker for this course, which is available in the Bookstore.*

#### Course Objectives:

This is a science course covering the prospects for life and its detection elsewhere in the Universe. It includes how humankind has impacted the evolution of life on Earth, and the potential impacts of extraterrestrial life on humankind. At the end of this course, students should have an understanding for how the Universe makes both the elements necessary for life and environments hospitable for life; how life developed, evolved, and survived on the Earth; how intelligent species may impact their world and terraform others; and be able to reflect on our place in the Universe, given our current scientific knowledge on the possibility of extraterrestrial life.

### COURSE REQUIREMENTS AND EVALUATIONS

Evaluation of your progress in this course will be done as follows:

- 1. Tests: During the semester you will be given 3 tests, each worth 20% of your final grade. Tests are composed of Multiple Choice and Short Answer questions.
- 2. Homework: There will be approximately six homework assignments during the semester. This homework accumulatively will account for 20% of your grade.
- 3. Group Projects: There will be one group project during the semester which will account for 10% of your grade.

- 4. Quizzes: There will be about 20 in-class one-question quizzes using clickers. These will account for 10% of your grade.

**GRADING SYSTEM**

Letter grades will be based on the following percentages for the full term work:  
A = 89.5% to 100%      B = 79.5% to 89.4%    C = 69.5% to 79.4%, D = 59.5% to 69.4%,  
F = 0.0% to 59.4%

**STUDENT SUCCESS**

The mission of Missouri State University is to develop educated persons. In this class, we will use the following instructional methods which support student learning and success: 1) small (focus) group discussions; 2) peer instruction; 3) clickers; and 4) group projects.

**COURSE OUTLINE**

**Section 1: Life in the Universe.** The origin of the Universe and how it made the chemistry for life. "We are all made of star stuff" was a common quote from the famed astronomer Carl Sagan and this section will describe what that means. The early Universe consisted of hot proton plasma, and only through stellar processes have elements other than H and He come to exist. 96% of the human body is made of the 4 elements oxygen, carbon, nitrogen, and hydrogen- 3 of which are only produced in stars. It took the Universe some time to produce the chemistry and environments for life, which in turn limits when life could have begun.

**Section 2: Life in the Solar System.** The formation of the solar system and evolution of planets in terms of habitable locations. Life exists on the Earth because it is an environmentally friendly location with the proper mix of complex chemistry that life uses for energy. This section describes how that came about in the general context of the formation of planetary systems and the delivery of water and biological material.

**Section 3: Earth-based life.** Properties of life (order, reproduction, growth and development, energy utilization, response to the environment, and evolutionary adaptation) will be explored, as well as microscopic life (cells, complex molecules, nucleic acids, DNA, and RNA), and biodiversity including; the 3 domains of life (bacteria, archaea, eukarya), the 4 metabolic classifications (photoautotrophs, chemoautotrophs, photoheterotrophs, and chemoheterotrophs), and extremophiles. This section also explores water's role on Earth and how a habitability zone is defined.

**Section 4: External and domestic pathways to change.** Astronomical events which changed evolution, human effect on the environment, and terraforming. This section will explore where Earth's water came from (likely external), extinction events (several of which are astronomical) and their influence on evolution, the ability of a civilization to influence their environment (nuclear holocaust, global warming, weather manipulation), and to produce suitable environments on other worlds (terraforming).



**Section 5: Habitable worlds outside our own Solar System.** Detection methods of extrasolar planets, Planets which may be habitable and alternate definitions of habitability. Carl Sagan once proposed that life could exist on gas planets in a similar fashion to how fish use buoyancy in Earth's oceans. This section will explore how habitable environments for life are defined and other possibilities for life. Under what conditions could the ingredients for life bear fruit?

**Section 6: Alien Life.** The search and consequences. Topics include passive and active methods for detecting extraterrestrial life; life and intelligence; and discussions about what it means to humans if there are 10 billion other worlds with life, or conversely, what if there are none?

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## **ACADEMIC POLICIES**

***Attendance Policy:*** Attendance is required at all lectures, as not all material can be obtained from the text alone. If you need to miss a test, you will need to take it beforehand, if you cannot attend when homework is due, you will need to turn it in beforehand. You do not need to e-mail me if you will not be in class: Homework and tests can only be made up with a note- so when you return, bring a note. However, if you will be gone for an extended period, please let me know.

***Attendance/Absentee policy:*** The University's attendance policy can be found in a link on the course web page, or in the Undergraduate Catalog at [www.missouristate.edu/attendan.html](http://www.missouristate.edu/attendan.html). While attendance will not count as a portion of your grade, absences during quizzes and focus group discussions may affect your grade. This topic is a very new and evolving topic and material may be presented in class which will not be available elsewhere. You should plan to attend every class period.

***Statement of 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](http://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.

***Statement of Cell Phone/Pager 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.

**Please make sure your cell phone does not create a distraction during class.**

**Keep it put away during class.**

***Emergency Response Assistance:***

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 (PSU405), 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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**Missouri State.**

**Curricular Action Workflow**



Missouri State > Computer Services - MIS > Curricular Action Workflow > CAW - New Interdisciplinary Program Proposal Form

## New Interdisciplinary Program Proposal Form

Submitted on 10/13/2015 by Janice Greene ([janicegreene@missouristate.edu](mailto:janicegreene@missouristate.edu)).

This special form is to be used for internal Missouri State approval of a new Interdisciplinary program involving two or more academic departments/schools including graduate programs, undergraduate majors (comprehensive or non-comprehensive), minors, graduate certificates, undergraduate certificates.

New graduate programs, new undergraduate majors, and certificate programs involving more than 18 credit hours require approval by the CBHE as well as approval through the Missouri State curricular process. CBHE applications for such programs are processed through the Office of Institutional Research. All proposals for new programs requiring CBHE approval should progress through the Missouri State curricular process accompanied by a draft of the required CBHE documentation.

Only select departments with at least 9 hours or at least 30% of total program hours.

Sponsoring Department (1): (responsible for administration and budget)

Biology

Sponsoring Department (2):

Geography, Geology, & Planning

Sponsoring Department (3): (if applicable)

Sponsoring Department (4): (if applicable)

Proposed Program Title:

Environmental Education Certificate

Choose One:

Major (Non-Comprehensive/Graduate Program)

Minor

Graduate Certificate

Comprehensive Major

Undergraduate Certificate

Master's Degree

Degree or Certificate Applicability:

15

BS - Bachelor of Science

**General Education Courses Required:**

GRY 108

Total Hours: 3

**General Education Courses Recommended:**

None

Total Hours: 0

**Requirements (including Admission) and Limitations for Specific Degree/Program:**

GRY 108 and BIO 561 required and three courses, with two prefixes, from the following list: BIO 373, 399, 485, 527, 547, 564, 579, GRY 318, 328, 348, 353, 399, GLG 110, 115, 171, 350, 360, 399, 547. No more than 3 hours of internship/coop (BIO 399, GRY 399, GLG 399) and only one field study course (BIO 527, GRY 353, GLG 360) will count toward the certificate.

Total Hours: 14-16

**Prerequisites for Required Courses:**

BIO 122, BIO 369 for some BIO courses; GRY 308, 310 for some GRY courses; GLG 110 for some GLG courses; CHEM 160, 161 and MTH 135 are required for GLG 547

**Recommended Electives:**

Three courses, with two prefixes, from the following list: BIO 373, 399, 485, 527, 547, 564, 579, GRY 318, 328, 348, 353, 399, GLG 110, 115, 171, 350, 360, 399, 547.

Total Hours: 9-11

**Limitations on Electives:**

No more than 3 hours of Internship/coop (BIO 399, GRY 399, GLG 399) and only one field study course (BIO 527, GRY 353, GLG 360) will count toward the certificate.

Please attach the following documents: (only one file may be attached for each requirement; accepts file types of PDF, DOC or DOCX)

1. Statement of Rationale: Attached

2. Estimated costs for first five years: Attached

95

3. Complete catalog description (including new courses and course changes pending approval): Attached

4. CBHE Application (If applicable): Not Attached

\*Note: For new programs requiring CBHE approval, CBHE forms NP, PS, and PG will satisfy #1 and CBHE form FP will satisfy #2.

What is the date that this new program was approved by departmental or program faculty? (MM/DD/YYYY)

10/7/2015

**Current Status:**

College Council Review

**Proposal Progress:**

10/26/2015 - Department Head Review - S Mathis - Approved

10/26/2015 - Department Head Review - Toby Dogwiler - Approved

**Review Comments:**

No comments have been added to this proposal.



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### Rationale

The career goals of many students include jobs that require them to periodically work with school age students either in the formal classroom or in a nonformal setting (e.g., nature centers, zoos, museums, parks or on field trips). These goals are frequently cited by students majoring in the Wildlife Option in Biology, students interested in geotourism students, and those with jobs that include education of the general public. Science and elementary education majors also cover many environmental issues in the classroom, and ecology-related topics or human-resource interactions are requirements in the state standards by the Missouri Department of Elementary and Secondary Education.

Although many science courses address environmentally related topics, this certificate would provide additional coursework to improve or broaden the background knowledge of these topics and would provide instruction on techniques for presenting environmental topics in formal and in nonformal education settings. It would also provide exposure to and access to a variety of national and regional environmental education resources that participants can use when developing their own educational programs in the future.

The coursework associated with this certificate will provide these students with valuable tools and information that will make them more competitive for jobs whose positions have an environmental education or interpretation component. In addition, science education students will be given additional background and resources to use with students and support their science education training generally.

This requirements of this certificate program do not overlap with the Conservation Education emphasis in the Elementary Education program or the graduate certificate in Conservation Education offered by the Department of Education. These requirements of these programs are a series of workshops offered in collaboration with the Missouri Department of Conservation. Enrollment in the proposed program does not preclude enrollment in one of the other programs. The two programs would be complementary, and some students/professionals may wish to complete both.

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Additional Costs

There would be no additional outlay of funds for establishment of this certificate program. Most of these courses and environmental education training workshops have been offered for years and continue to have solid enrollment by Biology/Wildlife and Science Education majors, not just those interested in a career in Environmental Education. Further, there is no undergraduate environmental education program on campus

### Catalog Description – Environmental Education Certificate

**Admission Criteria:** The Environmental Education Certificate program is open to all interested persons.

**Completion Requirements:** Once admitted to the program, the student must take a minimum of five courses as designated and approved and must have an average cumulative grade point average of 2.50 or better in the courses required to receive the certificate. Students must satisfy all prerequisites for any courses they take in the program or they must obtain instructor approval to waive any prerequisites.

**Curriculum (14-16 hours total):** Students will complete two required courses – GRY 108 (Principles of Sustainability) and BIO 561 (Environmental Issues Education and Interpretation). In addition, students will complete three courses from listed electives from at least two different prefixes. Only one internship and one field course can count toward this program. Electives include:

BIO 399 Cooperative Education in Biology  
BIO 485 Marine Conservation  
BIO 527 Field Biology  
BIO 547 Water Resources  
BIO 564 Ozark Natural Communities  
BIO 579 Conservation Biology

GRY 318 Geography of the National Parks  
GRY 328 Principles of Geotourism  
GRY 348 Geomorphology  
GRY 353 Geographic Field Studies  
GRY 399 Internship in Geography

GLG 110 Principles of Geology  
GLG 114 Life of the Past  
GLG 171 Environmental Geology  
GLG 350 Speleology  
GLG 360 Directed Field Trips  
GLG 399 Internship in Geology  
GLG 547 Water Resources (may only take GLG or BIO 547)

Other courses approved by the faculty advisor for the program may be substituted for any of the above listed courses on a case-by-case basis.