



## MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY

*Formerly University of Missouri-Rolla*

Agenda  
Campus Curricula Committee Meeting  
January 5, 2011  
1 p.m. Room 117 Fulton Hall

**Review of submitted DC forms:**

DC 0374, Chemistry Bachelor of Science, Pre-medicine Emphasis Area, effective Fall 2011. A proposal to modify the current curriculum by changing Bio Sci 211 to 3 credit hours and adding Bio Sci 212, 1 credit hour.

DC 0375, Chemistry Bachelor of Science, Biochemistry Emphasis Area, effective Fall 2011. A proposal to modify the current curriculum by changing Bio Sci 211 to 3 credit hours and adding Bio 212, 1 credit hour and modifying the elective footnotes.

DC 0376, History and Political Science, Political Science Minor, effective Fall 2011. A proposal to modify the current curriculum for the political science minor.

**Review of submitted CC forms:**

CC 8098, Computer Science 206, Software Engineering I, effective Fall 2011.

CC 8100, Political Science 317, Program Analysis and Evaluation, effective Fall 2011.

CC 8101, Computer Science 302, Agile Software Development, effective Fall 2011.

CC 8104, Chemistry 361, General Biochemistry, effective Fall 2011.

**Review of submitted EC forms:**

EC 2307, Ceramic Engineering 301, Advanced Materials and Processes for Electrochemical Devices, effective Spring 2011.

EC 2308, Ceramic Engineering 201, Materials and Processes for Electrochemical Devices, effective Spring 2011.

EC 2309, Computer Science 401, Cloud Computing, effective Fall 2011.



## MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY

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*Formerly University of Missouri-Rolla*

**Tabled Items:**

CC 8004, Aerospace Engineering 319, Advanced Thermodynamics. **Tabled**

CC 8072, MSE 418, Principles for Advanced Microstructural Design, effective Spring 2011. **Tabled**

CC 8074, Explosives Engineering 491, Internship, effective Summer 2011. **Tabled**

CC 8075, Explosives Engineering 499, Practicum, effective Summer 2011. **Tabled**

Effective Year: 2011

Effective Term: Summer ☐ Fall ☒ Spring ☐

(Creating or modifying a degree program must be effective for a Fall term)

DC # 0374-2010-Chem-000-00

## Degree Change Form (DC)

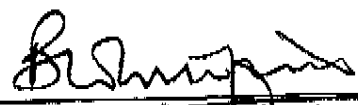
This form is to be used for creating or modifying degree programs, emphasis areas, and minors.

**Title of degree program, emphasis area, or minor:**  
Chemistry Pre-medicine Emphasis Area

**Department:** Chemistry

**Briefly describe action requested (Attach documentation as appropriate):**

Change the requirement from Bio Sc 211 - Cellular Biology, 4 credit hours to Bio Sci 211 - Cell Biology, 3 credit hours and Bio Sci 212 - Cell Biology Laboratory, 1 credit hour. The course used to be a combined lecture and lab and is now split into two separate courses. Correction in curriculum to reflect this change. Also correction in course title for Chem 363 from Intermediary Metabolism to Metabolism. (See attached for present curriculum and proposed curriculum.)

Recommended by Department:   
(Chair signature)

Date: 11/27/10

Recommended by:   
Discipline Specific Curricula Committee (Chair signature)

Date: 11/18/2010

Approved by Curricula Committee: \_\_\_\_\_  
(Chair signature)

Date: \_\_\_\_\_

Approved by Faculty Senate: \_\_\_\_\_  
(Chair signature)

Date: \_\_\_\_\_

11/03/10

(Revised 1/31/2008)

**Present****Chemistry  
Pre-medicine Emphasis Area****FRESHMAN YEAR**

	Credit
First Semester	
Chem 1-General Chemistry .....	4
Chem 2-General Chemistry Lab .....	1
Chem 4-Intro to Lab Safety & Hazardous Materials ....	1
Chem 11-Intro to Chemistry .....	1
Math 8-Calculus with Analytic Geometry I.....	5
English 20-Exposition & Argumentation .....	3
History 112,175,176 or Pol Sc 90 .....	3
	18

**Second Semester**

Chem 3-General Chemistry .....	3
Chem 8-Qualitative Analysis .....	2
Math 21-Calculus with Analytic Geometry II.....	5
Bio Sc 110-General Biology.....	3
Bio Sc 112-General Biology Lab.....	2
Humanities Elective.....	3
	18

**SOPHOMORE YEAR**

	Credit
First Semester	
Chem 221-Organic Chemistry I .....	4
Chem 226-Organic Chemistry I Lab .....	1
Math 22-Calculus with Analytic Geometry III.....	4
Physics 21-General Physics I .....	4
Physics 22-General Physics Lab .....	1
Bio Sc 211-Cellular Biology .....	4
	18

**Second Semester**

Chem 223-Organic Chemistry II.....	4
Chem 228-Organic Chemistry II Lab .....	1
Physics 25-General Physics II.....	4
Physics 26-General Physics II Lab.....	1
Cmp Sc 53 or Cmp Sc 74 & 78-Intro to Programming. 3	
Stat 213-Applied Eng Stat .....	3
	16

**JUNIOR YEAR**

	Credit
First Semester	
Chem 343-Intro to Quantum Chemistry.....	3
Chem 361-Biochemistry .....	3
Chem 362-Biochemistry Lab .....	2
English 60-Writing & Research .....	3
Bio Sc 241-Human Anatomy .....	5
	16

	Credit
Second Semester	
Chem 151-Anal. Chem I .....	4
Chem 241-Physical Chemistry .....	3
Chem 242-Physical Chem Lab .....	1
Chem 363-Intermediary Metabolism .....	3
Bio Sc 242-Human Physiology .....	5
	16

**SENIOR YEAR**

	Credit
First Semester	
Chem 243-Physical Chemistry .....	3
Chem 244-Physical Chem Lab .....	1
Chem 251-Anal. Chem II .....	4
Chem 310-Undergraduate Seminar or	
Chem 390-Undergraduate Research .....	1
Social Sciences Elective .....	3
Literature Elective.....	3
	15

**Second Semester**

Chem 237-Inorganic Chemistry .....	3
Chem 238-Inorganic Chem Lab .....	1
Chem 310-Undergraduate Seminar or	
Chem 390-Undergraduate Research .....	1
Chem 328-Organic Synthesis & Spec. Analysis .....	3
Advanced Chemistry Electives .....	2
Social Sciences Elective .....	3
Humanities Elective.....	3
	16

**Notes:**

**Grade Requirements:** Students must complete a minimum of 133 credit hours for the Bachelor of Science in Chemistry degree. A minimum grade of "C" is required for each Chemistry course counted towards the degree.

**ROTC:** Basic ROTC may be taken in the freshman and sophomore years, but is not countable towards a degree.

**Chemistry Electives:** The advanced Chemistry Elective is chosen from Chem 321, 331, 346, 381, 385.

**Electives:** At least three hours of the humanities or literature electives are to be at the 100 level or higher.

**Proposed****Chemistry  
Pre-medicine Emphasis Area****FRESHMAN YEAR**

	Credit
First Semester	
Chem 1-General Chemistry .....	4
Chem 2-General Chemistry Lab .....	1
Chem 4-Intro to Lab Safety & Hazardous Materials ....	1
Chem 11-Intro to Chemistry .....	1
Math 8-Calculus with Analytic Geometry I .....	5
English 20-Exposition & Argumentation .....	3
History 112,175,176 or Pol Sc 90 .....	3
	18

**Second Semester**

Chem 3-General Chemistry .....	3
Chem 8-Qualitative Analysis .....	2
Math 21-Calculus with Analytic Geometry II .....	5
Bio Sc 110-General Biology .....	3
Bio Sc 112-General Biology Lab .....	2
Humanities Elective .....	3
	18

**SOPHOMORE YEAR**

	Credit
First Semester	
Chem 221-Organic Chemistry I .....	4
Chem 226-Organic Chemistry I Lab .....	1
Math 22-Calculus with Analytic Geometry III .....	4
Physics 21-General Physics I .....	4
Physics 22-General Physics Lab .....	1
Bio Sc 211-Cell Biology .....	3
Bio Sc 212-Cell Biology Lab .....	1
	18

**Second Semester**

Chem 223-Organic Chemistry II .....	4
Chem 228-Organic Chemistry II Lab .....	1
Physics 25-General Physics II .....	4
Physics 26-General Physics II Lab .....	1
Cmp Sc 53 or Cmp Sc 74 & 78-Intro to Programming. 3	
Stat 213-Applied Eng Stat .....	3
	16

**JUNIOR YEAR**

	Credit
First Semester	
Chem 343-Intro to Quantum Chemistry .....	3
Chem 361-Biochemistry .....	3
Chem 362-Biochemistry Lab .....	2
English 60-Writing & Research .....	3
Bio Sc 241-Human Anatomy .....	5
	16

	Credit
Second Semester	
Chem 151-Analytical Chemistry I .....	4
Chem 241-Physical Chemistry .....	3
Chem 242-Physical Chem Lab .....	1
Chem 363-Metabolism .....	3
Bio Sc 242-Human Physiology .....	5
	16

**SENIOR YEAR**

	Credit
First Semester	
Chem 243-Physical Chemistry .....	3
Chem 244-Physical Chem Lab .....	1
Chem 251-Analytical Chemistry II .....	4
Chem 310-Undergraduate Seminar or	
Chem 390-Undergraduate Research .....	1
Social Sciences Elective .....	3
Literature Elective .....	3
	15

**Second Semester**

Chem 237-Inorganic Chemistry .....	3
Chem 238-Inorganic Chem Lab .....	1
Chem 310-Undergraduate Seminar or	
Chem 390-Undergraduate Research .....	1
Chem 328-Organic Synthesis & Spec. Analysis .....	3
Advanced Chemistry Electives .....	2
Social Sciences Elective .....	3
Humanities Elective .....	3
	16

**Notes:**

**Grade Requirements:** Students must complete a minimum of 133 credit hours for the Bachelor of Science in Chemistry degree. A minimum grade of "C" is required for each Chemistry course counted towards the degree.

**ROTC:** Basic ROTC may be taken in the freshman and sophomore years, but is not countable towards a degree.

**Chemistry Electives:** The advanced Chemistry Elective is chosen from Chem 321, 331, 346, 381, 385.

**Electives:** At least three hours of the humanities or literature electives are to be at the 100 level or higher.

Effective Year: 2011

Effective Term: Summer ☐ Fall ☒ Spring ☐  
(Creating or modifying a degree program must be effective for a Fall term)

DC # 0375-2010-Chem-000-00

## Degree Change Form (DC)

This form is to be used for creating or modifying degree programs, emphasis areas, and minors.

**Title of degree program, emphasis area, or minor:**  
Chemistry Biochemistry Emphasis Area

**Department:** Chemistry

**Briefly describe action requested (Attach documentation as appropriate):**

Change the requirement from Bio Sc 211 - Cellular Biology, 4 credit hours to Bio Sci 211 - Cell Biology, 3 credit hours and Bio Sci 212 - Cell Biology Laboratory, 1 credit hour. The course used to be a combined lecture and lab and is now split into two separate courses. Correction in curriculum to reflect this change.

Correction in course title for Chem 363 from Intermediary Metabolism to Metabolism. Correction in Electives notes: Biology, 200 and 300 level - remove "especially 211" because this is a required course. (See attached for present curriculum and proposed curriculum.)

Recommended by Department: \_\_\_\_\_

(Chair signature)

Date: 11/9/10

Recommended by: \_\_\_\_\_

Discipline Specific Curricula Committee

(Chair signature)

Date: 11/18/2010

Approved by Curricula Committee: \_\_\_\_\_

(Chair signature)

Date: \_\_\_\_\_

Approved by Faculty Senate: \_\_\_\_\_

(Chair signature)

Date: \_\_\_\_\_

11/03/10

(Revised 1/31/2008)

**Present****Chemistry  
Biochemistry Emphasis Area****FRESHMAN YEAR**

	Credit
First Semester	
Chem 1-General Chemistry .....	4
Chem 2-General Chemistry Lab .....	1
Chem 4-Intro to Lab Safety Hazardous Materials .....	1
Chem 11-Intro to Chemistry .....	1
Math 8-Calculus with Analytic Geometry I.....	5
English 20-Exposition & Argumentation .....	3
History 112,175,176 or Pol Sc 90 .....	3
	18

**Second Semester**

Chem 3-General Chemistry .....	3
Chem 8-Qualitative Analysis .....	2
Math 21-Calculus with Analytic Geometry II.....	5
Bio Sc 211-Cellular Biology .....	4
Humanities Elective.....	3
	17

**SOPHOMORE YEAR**

	Credit
First Semester	
Chem 221-Organic Chemistry I .....	4
Chem 226-Organic Chemistry I Lab .....	1
Math 22-Calculus with Analytic Geometry III.....	4
Physics 21-General Physics I.....	4
Physics 22-General Physics Lab .....	1
Literature Elective.....	3
	17

**Second Semester**

Chem 223-Organic Chemistry II .....	4
Chem 228-Organic Chemistry II Lab .....	1
Physics 25-General Physics II.....	4
Physics 26-General Physics II Lab.....	1
Cmp Sc 53 or Cmp Sc 74 & 78-Intro to Prog .....	3
Stat 213-Applied Eng Stat .....	3
	16

**JUNIOR YEAR**

	Credit
First Semester	
Chem 343-Intro to Quantum Chemistry.....	3
Chem 361-Biochemistry .....	3
Chem 362-Biochemistry Lab .....	2
English 60-Writing & Research .....	3
Social Sciences Elective .....	3
Electives.....	3
	17

	Credit
Second Semester	
Chem 151-Analytical Chemistry I.....	4
Chem 241-Physical Chemistry .....	3
Chem 242-Physical Chem Lab .....	1
Chem 363-Intermediary Metabolism .....	3
Humanities Elective.....	3
Electives.....	2
	16

**SENIOR YEAR**

	Credit
First Semester	
Chem 243-Physical Chemistry .....	3
Chem 244-Physical Chem Lab .....	1
Chem 251-Analytical Chemistry II.....	4
Chem 310-Undergraduate Seminar or	
Chem 390-Undergraduate Research .....	1
Bio Sc 331-Molecular Genetics.....	3
Elective .....	3
	15

**Second Semester**

Chem 237-Inorganic Chemistry .....	3
Chem 238-Inorganic Chem Lab .....	1
Chem 300-Special Problems .....	1
Chem 310-Undergraduate Undergraduate Seminar or	
Chem 390-Undergraduate Research .....	1
Chem 328-Organic Syn & Spec Analy .....	3
Social Sciences Elective .....	3
Elective .....	3
	15

**Notes:**

**Grade Requirements:** Students must complete a minimum of 131 credit hours for the Bachelor of Science in Chemistry degree. A minimum grade of "C" is required for each Chemistry course counted towards the degree.

**ROTC:** Basic ROTC may be taken in the freshman and sophomore years, but is not countable towards a degree.

**Electives:** There are eleven (11) hours of electives. Students planning to attend graduate school are encouraged to incorporate additional higher level chemistry electives, math, and foreign language, including a scientific literature course. Recommended courses include but are not limited to the following.

- Biology, 200 and 300 level especially 211
- Math 200 and 300 level, especially 204, 208 and 325
- Physics 200 and 300 level, especially 208, 221, 323 & 341
- Statistics, 200 & 300 level, especially 343, 346 & 353
- Ceramic Engineering 391 and 392, or Geology 381
- A foreign language series, French, German or Russian are recommended.

## Proposed

### Chemistry Biochemistry Emphasis Area

#### FRESHMAN YEAR

	Credit
First Semester	
Chem 1-General Chemistry .....	4
Chem 2-General Chemistry Lab .....	1
Chem 4-Intro to Lab Safety Hazardous Materials .....	1
Chem 11-Intro to Chemistry .....	1
Math 8-Calculus with Analytic Geometry I .....	5
English 20-Exposition & Argumentation .....	3
History 112,175,176 or Pol Sc 90 .....	3
	18

#### Second Semester

Chem 3-General Chemistry .....	3
Chem 8-Qualitative Analysis .....	2
Math 21-Calculus with Analytic Geometry II .....	5
Bio Sc 211-Cell Biology .....	3
Bio Sc 212-Cell Biology Lab .....	1
Humanities Elective .....	3
	17

#### SOPHOMORE YEAR

	Credit
First Semester	
Chem 221-Organic Chemistry I .....	4
Chem 226-Organic Chemistry I Lab .....	1
Math 22-Calculus with Analytic Geometry III .....	4
Physics 21-General Physics I .....	4
Physics 22-General Physics Lab .....	1
Literature Elective .....	3
	17

#### Second Semester

Chem 223-Organic Chemistry II .....	4
Chem 228-Organic Chemistry II Lab .....	1
Physics 25-General Physics II .....	4
Physics 26-General Physics II Lab .....	1
Cmp Sc 53 or Cmp Sc 74 & 78-Intro to Prog .....	3
Stat 213-Applied Eng Stat .....	3
	16

#### JUNIOR YEAR

	Credit
First Semester	
Chem 343-Intro to Quantum Chemistry .....	3
Chem 361-Biochemistry .....	3
Chem 362-Biochemistry Lab .....	2
English 60-Writing & Research .....	3
Social Sciences Elective .....	3
Electives .....	2
	17

	Credit
Second Semester	
Chem 151-Analytical Chemistry I .....	4
Chem 241-Physical Chemistry .....	3
Chem 242-Physical Chem Lab .....	1
Chem 363-Metabolism .....	3
Humanities Elective .....	3
Electives .....	2
	16

#### SENIOR YEAR

	Credit
First Semester	
Chem 243-Physical Chemistry .....	3
Chem 244-Physical Chem Lab .....	1
Chem 251-Analytical Chemistry II .....	4
Chem 310-Undergraduate Seminar or	
Chem 390-Undergraduate Research .....	1
Bio Sc 331-Molecular Genetics .....	3
Elective .....	3
	15

#### Second Semester

Chem 237-Inorganic Chemistry .....	3
Chem 238-Inorganic Chem Lab .....	1
Chem 300-Special Problems .....	1
Chem 310-Undergraduate Undergraduate Seminar or	
Chem 390-Undergraduate Research .....	1
Chem 328-Organic Syn & Spec Analy .....	3
Social Sciences Elective .....	3
Elective .....	3
	15

#### Notes:

**Grade Requirements:** Students must complete a minimum of 131 credit hours for the Bachelor of Science in Chemistry degree. A minimum grade of "C" is required for each Chemistry course counted towards the degree.

**ROTC:** Basic ROTC may be taken in the freshman and sophomore years, but is not countable towards a degree.

**Electives:** There are eleven (11) hours of electives. Students planning to attend graduate school are encouraged to incorporate additional higher level chemistry electives, math, and foreign language, including a scientific literature course. Recommended courses include but are not limited to the following.

- Biology, 200 and 300 level
- Math 200 and 300 level, especially 204, 208 and 325
- Physics 200 and 300 level, especially 208, 221, 323 & 341
- Statistics, 200 & 300 level, especially 343, 346 & 353
- Ceramic Engineering 391 and 392, or Geology 381
- A foreign language series, French, German or Russian are recommended.



Effective Year: 2011

DC # 0376-2010-PolSci-000-00

Effective Term: Summer ☐ Fall ☒ Spring ☐

(Creating or modifying a degree program must be effective for a Fall term)

*Revised*

## Degree Change Form (DC)

This form is to be used for creating or modifying degree programs, emphasis areas, and minors.

**Title of degree program, emphasis area, or minor:**

Political Science Minor

**Department:** History and Political Science

**Briefly describe action requested (Attach documentation as appropriate):**

Current Requirements: The Department of History and Political Science offers a minor degree in political science which must include 15 hours divided as follows: completion of American Government (Pol. Sc. 90) and Theories and Issues of Political Science (Pol. Sc 235), plus an approved sequence of 9 hours of 200 and 300 level courses.

New Requirements: The Department of History and Political Science offers a minor degree in political science which must include 15 hours divided as follows: completion of American Government (Pol. Sc. 90), plus an approved sequence of 12 hours of 200 and 300 level courses.

*2010/10/10  
dis*

Recommended by Department: \_\_\_\_\_

*[Signature]*  
(Chair signature)

Date: 11/3/10

Recommended by: \_\_\_\_\_

Discipline Specific Curricula Committee

*[Signature]*  
(Chair signature)

Date: 12/8/2010

Approved by Curricula Committee: \_\_\_\_\_

(Chair signature)

Date: \_\_\_\_\_

Approved by Faculty Senate: \_\_\_\_\_

(Chair signature)

Date: \_\_\_\_\_

12/06/10

(Revised 1/31/2008)

CC File # 8098-2010-CS-206-32

Effective Year: 2011

Term: Summer ☐Fall ☒Spring ☐**Course Change Form (CC)**

This form is for creating or modifying permanent courses.

**Course Changes** (Check all changes.)New Course ☐Course Deletion ☐Credit Hours ☐Prerequisites ☒Course Title ☐Catalog Description ☐Course Number ☐Co-listing ☐**Course Information** (1-9 Must Be Completed. Leave "Proposed" items blank if no change is being made.)

1. Department: Comp Sci

2. Discipline and Course Number: Present: CS206

Proposed:

3. Course Title: Present: Software Engineering I

Proposed:

Abbreviated Course Title:

(24 Spaces or Less. Only needed for New Courses or Title Changes.)

4. Catalog Description (300 Character Spaces or Less.)

Present: Development of methodologies useful in the software engineering classical life cycle. This includes: requirements, design, implementation, and testing phases. These methodologies are reinforced through utilization of a CASE tool and a group project.

Proposed:

5. If course requires field trip check box: ☐

6. Credit Hours:

Present:

Lecture: 3

Lab: 0

Total: 3

Proposed:

Lecture:

Lab:

Total:

7. Prerequisites:

Present: Cmp Sci 253

AT LEAST

Proposed: Cmp Sci 253 and Junior standing

8. Required for Majors: ☒ Elective for Majors: ☐

9. Justification: When established as a requirement for Majors, this course had been numbered as a 200 level course. The unintended consequence was that this course is now typically taken too early in the course of study, at a point where students are still learning how to program and do not yet appreciate the difficulties of "programming in the large." Students therefore perceive this course as not relevant to their education and it often is a challenge for teachers to achieve the course objectives of training students in the essentials of developing software systems. By requiring junior standing, students will take the course at a more appropriate time.

10. Semesters previously offered as an experimental course (101, 201, 301, 401):

11. List all co-listed courses, Initialed by Dept. Chair, if signature does not appear below.

1)

2)

3)

4)

5)

6)

Recommended by Department

(Chair signature)

Recommended by Discipline Specific Curricula Committee

(Chair signature)

Approved by Curricula Committee:

(Chair signature)

Approved by Faculty Senate:

(Chair signature)

Date: 11/5/2010

Date: 11/18/2010

Date:

Date:

Effective Year: 2011

CC File # 8100-2010-PolSci-317-i

Term: Summer ☐ Fall ☒ Spring ☐**Course Change Form (CC)**

This form is for creating or modifying permanent courses.

**Course Changes** (Check all changes.)

New Course ☐ Course Deletion ☐ Credit Hours ☐ Prerequisites ☐  
 Course Title ☒ Catalog Description ☐ Course Number ☐ Co-listing ☐

**Course Information** (1-9 Must Be Completed. Leave "Proposed" items blank if no change is being made.)

1. Department: History and Political Science

2. Discipline and Course Number: Present: Pol. Sci. 317 Proposed:

3. Course Title: Present: Program Analysis and Evaluation  
Proposed: Public Policy Analysis

Abbreviated Course Title: Policy Analysis

(24 Spaces or Less. Only needed for New Courses or Title Changes.)

4. Catalog Description (300 Character Spaces or Less.)

Present: An advanced study of major U.S. national policies. A wide range of public policies, including education, economics, and health and welfare will be studied. Students will be introduced to the methods of policy analysis. Emphasis will be placed on the use of tools used by policy analysts to determin

Proposed:

5. If course requires field trip check box: ☐

6. Credit Hours:	Present:	Lecture: 3	Lab:	Total: 3
	Proposed:	Lecture:	Lab:	Total:

7. Prerequisites:

Present: Political Science 90

Proposed:

8. Required for Majors: ☐ Elective for Majors: ☒

9. Justification: Title change better reflects course content and the way most political science departments label this course.

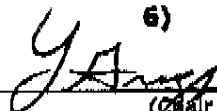
10. Semesters previously offered as an experimental course (101, 201, 301, 401):

11. List all co-listed courses, initialed by Dept. Chair, if signature does not appear below.

1) 2) 3)

4) 5) 6)

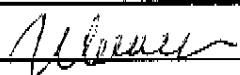
Recommended by Department



(Chair signature)

Date: 11/30/10

Recommended by Discipline Specific Curricula Committee



(Chair signature)

Date: 12/8/2010

Approved by Curricula Committee:

(Chair signature)

Date: \_\_\_\_\_

Approved by Faculty Senate:

(Chair signature)

Date: \_\_\_\_\_

(Revised 1/29/09)

Effective Year: 2011

Term: Summer ☐ Fall ☒ Spring ☐

CC File # 8101-2010-CS-302-10

**Course Change Form (CC)**

This form is for creating or modifying permanent courses.

**Course Changes** (Check all changes.)New Course ☒Course Deletion ☐Credit Hours ☐Prerequisites ☐Course Title ☐Catalog Description ☐Course Number ☐Co-listing ☐**Course Information** (1-9 Must Be Completed. Leave "Proposed" items blank if no change is being made.)

1. Department: Cmp Sc

2. Discipline and Course Number: Present:

Proposed: Cmp Sc 302

3. Course Title: Present:

Proposed: Agile Software Development

Abbreviated Course Title: Agile Soft. Development

(24 Spaces or Less. Only needed for New Courses or Title Changes.)

4. Catalog Description (300 Character Spaces or Less.)

Present:

Proposed: Understand principles of agile software development and contrast them with prescriptive processes. Specifically: Eliciting, organizing, and prioritizing requirements; Design processes; Understand how a particular process promotes quality; Estimate costs and measure project progress and productivity.

5. If course requires field trip check box: ☐

6. Credit Hours:

Present:

Lecture:

Lab:

Total:

Proposed:

Lecture: 3

Lab: 0

Total: 3

7. Prerequisites:

Present:

Proposed: Cmp Sc 206

8. Required for Majors: ☐ Elective for Majors: ☒

9. Justification: Offered twice before as experimental course. Provides in-depth knowledge on agile software development processes that are increasingly being used as an alternative to traditional processes.

10. Semesters previously offered as an experimental course (101, 201, 301, 401): FS2008, FS2010

11. List all co-listed courses, initialed by Dept. Chair, if signature does not appear below.

1)

2)

3)

4)

5)

6)

Recommended by Department

(Chair signature)

Recommended by Discipline Specific Curricula Committee

(Chair signature)

Approved by Curricula Committee:

(Chair signature)

Approved by Faculty Senate:

(Chair signature)

Date: Dec 1, 2010

Date: 12/13/2010

Date: \_\_\_\_\_

Date: \_\_\_\_\_

(Revised 1/29/09)

Effective Year: 2011

Term: Summer ☐ Fall ☒ Spring ☐

CC File # 8104-2010-Chem-361-32

**Course Change Form (CC)**

This form is for creating or modifying permanent courses.

**Course Changes** (Check all changes.)

New Course ☐ Course Deletion ☐ Credit Hours ☐ Prerequisites ☒  
 Course Title ☐ Catalog Description ☐ Course Number ☐ Co-listing ☐

**Course Information** (1-9 Must Be Completed. Leave "Proposed" items blank if no change is being made.)

1. Department: Chemistry

2. Discipline and Course Number: Present : Chem 361

Proposed:

3. Course Title: Present: General Biochemistry

Proposed:

Abbreviated Course Title:

(24 Spaces or Less. Only needed for New Courses or Title Changes.)

4. Catalog Description (300 Character Spaces or Less.)

Present: A resume of the important aspects of quantitative and physical chemistry in biochemical processes. General subjects covered include: proteins, nucleic acids, enzymes, carbohydrates and lipids.

Proposed:

5. If course requires field trip check box: ☐

6. Credit Hours: Present: Lecture: 3.0 Lab: Total: 3.0  
 Proposed: Lecture: Lab: Total:

7. Prerequisites:

Present: Chem 223 and Bio 211.

Proposed: Chem 223.

8. Required for Majors: ☒ Elective for Majors: ☐

9. Justification: Bio 211 is not extremely important as a prerequisite, and students are usually allowed to take the course without it. Removing it as a prerequisite eliminates the need for prerequisite waiver forms.


10. Semesters previously offered as an experimental course (101, 201, 301, 401):

11. List all co-listed courses, initialed by Dept. Chair, if signature does not appear below.

1) 2) 3)

4) 5) 6)

Recommended by Department



(Chair signature)

Date: 11/24/10

Recommended by Discipline Specific Curricula Committee



(Chair signature)

Date: 12/13/2010

Approved by Curricula Committee:

(Chair signature)

Date:

Approved by Faculty Senate:

(Chair signature)

Date:

(Revised 1/29/09)

Effective Year: 2011

Effective Term: Summer ☐ Fall ☐ Spring ☒

EC File # 2307-Sp2011-Cee-301

## Experimental Course Form (EC)

This form must be filed with the Secretary to the Campus Curricula Committee, after the department chair's notation, by the appropriate deadline. Filing deadlines for inclusion in the initial release of the Schedule of Classes are as follows:

Summer and Fall Semester Offerings – January 1  
Spring Semester Offerings – August 1

An EC form must be submitted each semester it is to be offered, not to exceed two offerings. An experimental course that is required should be submitted on a CC form. *Co-listed offerings should be submitted on one form, originating from the primary discipline.*

Department: MSE

Discipline and Course Number: CER 301

Course Title: Advanced Materials and Processes for Electrochemical Devices

Abbreviated Title (24 spaces or less): Electrochemical Devices

Instructor(s): Schwartz

Credit Hours: Lecture: 3.0 Lab: 1.0 Total: 4.0

Prerequisites: Graduate student standing in a science or engineering discipline.

Semester(s) previously taught: Never

Brief Course Description: (40 words or less)

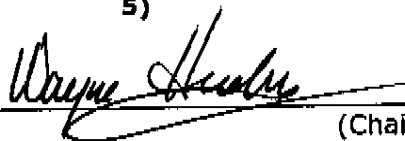
This course will provide an overview of materials aspects of advanced batteries and battery systems, focusing on electrode materials, separators and electrolytes. Current materials challenges that must be met to further improve battery performance will be discussed. A research topic on advanced battery materials (term paper) is required.

List all co-listed courses: Include initials of Dept. Chair, if signature is not already included below.

1) 2) 3)

4) 5) 6)

Department Chair:



(Chair Signature)

Date:

11/16/10

Discipline Specific Curricula Committee:



(Chair signature)

Date:

11/29/10

Curricula Committee:

(Chair Signature)

Date:

**MSE XXX**  
**ADVANCED MATERIALS & PROCESSING METHODS FOR ELECTROCHEMICAL**  
**DEVICES**  
**(4.0 HRS: 3.0 LEC; 1.0 LAB)**  
**SPRING 2011**

**Instructor (tentative):**

Robert W. Schwartz  
Professor, Department of Materials Science and Engineering  
Office: 110 Engineering Research Laboratory  
Ph. 573.341.7887  
Fax: 573.341.4979  
Email: [rschwartz@mst.edu](mailto:rschwartz@mst.edu)

**Office Hours and Appointments:**

- Office Hours: Monday – Friday 3 – 4 pm
- Electronic Office Hours: Monday 7 – 8 pm
- I also welcome appointments and you may also sign up for an appointment using the schedule that is posted outside my door or by email.
- You are also free to drop by my office at other times and come in if the door is open.
- A help/study session will be scheduled prior to each examination.

**Lecture Portion of Course**

Lecture: 11:00 – 11:50 MWF (synchronous delivery; lecture tapes available for asynchronous)

*Late arrival of professor:* In the event no prior notice is given, students are required to wait 15 minutes before departing. The instructor will make every attempt to find a substitute teacher for those days on which he is on travel.

**Description:**

This course will provide an overview of materials aspects of advanced batteries and battery systems, focusing on electrode materials, separators and electrolytes. Material properties that influence battery performance characteristics, such as capacity, charge and discharge rates will be reviewed from both practical and theoretical perspectives. Current materials challenges that must be met to further improve battery performance will be discussed.

**Educational Objective:**

At the conclusion of this course, the student will have a basic knowledge of the materials aspects of advanced batteries and current technical challenges.

**Textbook:** Handbook of Batteries by David Linden and Thomas Reddy

**Additional Texts:** Advanced Batteries: Materials Science Aspects by Robert A. Huggins  
Handbook of Battery Materials by D. O. Besenhard

**Course Prerequisites:** Graduate level standing in Engineering Technology (MSSU) or science or engineering (Missouri S&T)

**Attendance Policy:**

Please review the Missouri S&T attendance and drop policy under Student Academic Regulations at [http://registrar.mst.edu/documents/academic\\_reg2008-2010.pdf](http://registrar.mst.edu/documents/academic_reg2008-2010.pdf). This policy applies to this course. Because there will be many in-class/on-line exercises and your participation is desired, you are encouraged to attend class.

**Classroom Etiquette and Participation:**

Please turn off your cell phones and PDA devices prior to the beginning of class. Please do not carry on personal conversations during class but it is acceptable to ask a peer for clarification of a particular point if a question arises. Your interaction with the instructor and your peers during the course is encouraged.

**Grading Policy:**

*Grading system:*

A:	90 – 100
B:	80 – 89
C:	70 – 79
D:	60 – 69
F:	< 60

**Grade Determination:**

The student's grade for the course will be determined by three hourly examinations, a final examination, quizzes, homework assignments, and an attendance/participation grade.

*Three Hourly examinations (10% each)*

*Term Paper on topic related to advanced battery materials (15%)*

*Final Examination (25%)* The final examination will be comprehensive.

*Homework Assignments (20%)*

Homework assignments must be handed at the beginning of the class period on the date due. For each day late, 25% of the value of the assignment will be deducted from the assignment grade. No homework assignments will be accepted if submitted more two school days after the due date. Solutions for homework assignments will be posted outside of B49 as soon as all homework assignments have been turned in, or after two school days, whichever comes first. You are encouraged to complete homework assignments by working in teams. If you work as a team member you are expected to pull your weight.

*Quizzes, Attendance, and Participation (10%)*

A few unannounced (as well as announced) quizzes will be given during the semester. Attendance will also be taken randomly during the semester and classroom etiquette will be monitored. Quizzes, attendance, classroom participation and classroom etiquette will count 5% of the final grade. Hint – if you are on the borderline between two grades, this is a great way to get that point or two you might need for the higher grade.

**Grading**

Three hourly exams plus final:	45%
Final examination	25%
Homework:	20%
Quizzes, etc.:	10%



Total: 100%

**Academic Alert System:** <http://academicalert.mst.edu>

The purpose of the Academic Alert System is to improve the overall academic success of students by improving communication among students, instructors and advisors; reducing the time required for students to be informed of their academic status; and informing students of actions necessary by them in order to meet the academic requirements in their courses. The instructor of this course will use the Academic Alert System.

**Academic Dishonesty:** <http://registrar.mst.edu/academicregs/index.html>

Page 30 of the Student Academic Regulations handbook describes the student standard of conduct relative to the University of Missouri Collected Rules and Regulations section 200.010, and offers descriptions of academic dishonesty including cheating, plagiarism or sabotage. Students are encouraged to review this policy.

**Disability Support Services:** <http://dss.mst.edu>

If you have a documented disability and anticipate needing accommodations in this course, you are strongly encouraged to meet with me early in the semester. You will need to request that the Disability Services staff send a letter to me verifying your disability and specifying the accommodation you will need before I can arrange your accommodation. Disability Support Services is located in 204 Norwood Hall. Their phone number is 341-4211 and their email is [dss@mst.edu](mailto:dss@mst.edu).

**Tentative List of Lecture Topics:**

1. Introductory materials
  - a. Battery types and architectures
  - b. General battery reactions
  - c. Thermodynamic aspects
  - d. Crystallographic aspects
2. Battery equivalent circuit model
3. Fundamentals of battery performance
  - a. Voltages
  - b. Capacities
  - c. Charge and discharge characteristics
4. Lithium ion batteries
  - a. Battery characteristics
  - b. Negative and positive electrodes
  - c. Lithium-carbon alloys
  - d. Metallic lithium alloys
5. Nickel metal hydride
  - a. Battery characteristics
  - b. Negative and positive electrodes
6. Other advanced battery technologies
7. Supercapacitor technology
8. Fuel cell technology
  - a. Solid oxide
  - b. PEM

**Laboratory Portion of Course****Time:** Lab: 2:00 – 5:00 Th**General Info.:** The purpose of MSE XXX Laboratory is to introduce students to general characterization methods for the evaluation of batteries and battery materials. The laboratory will be offered on both the MSSU and Missouri S&T campuses.**Course Credits:** 1.0 (out of 4.0 for MSE XXX)**Textbook:** None.**Lab Assistants:** TBD**Homework:** For the 9 labs, a report or presentation will be due. These will be graded as detailed below. Late reports will penalized 5% per day that the report is late.

<b>Grading:</b>	6 Group Lab reports x 100 pts =	600 pts
	3 Presentations x 100 pts =	300 pts
	Peer Evaluation =	300 pts
	<hr/> Total Points =	<hr/> 1200 pts

**Additional Grading Information:** Separate lecture and laboratory grades will not be given. The laboratory grade will count for 25% of the grade in the course. A standard 90 – 100% = A, etc. grading scheme will be used.**Lab Format:** Nine labs will be performed during the semester; a list is given below. Four person teams will be used for all labs.**Laboratories:**

1. Battery (cell) construction
2. Battery voltage and discharge testing
3. Battering charging characteristics
4. Battery power management
5. Cell chemistry effects
6. Use of DC methods for electrode characterization
7. Use of AC methods for electrode characterization
8. Use of DC methods for electrolyte characterization
9. Use of AC methods for electrolyte characterization

Effective Year: 2011

Effective Term: Summer ☐ Fall ☐ Spring ☒

EC File #2308-Sp2011-CER-201

## Experimental Course Form (EC)

This form must be filed with the Secretary to the Campus Curricula Committee, after the department chair's notation, by the appropriate deadline. Filing deadlines for inclusion in the initial release of the Schedule of Classes are as follows:

Summer and Fall Semester Offerings – January 1  
Spring Semester Offerings – August 1

An EC form must be submitted each semester it is to be offered, not to exceed two offerings. An experimental course that is required should be submitted on a CC form. *Co-listed offerings should be submitted on one form, originating from the primary discipline.*

Department: MSE

Discipline and Course Number: CER 201

Course Title: Materials and Processes for Electrochemical Devices

Abbreviated Title (24 spaces or less): Electrochemical Devices

Instructor(s): Schwartz

Credit Hours: Lecture: 3.0 Lab: 1.0 Total: 4.0

Prerequisites: Junior level standing in science or engineering discipline.

Semester(s) previously taught: Never

Brief Course Description: (40 words or less)

This course will provide an overview of materials aspects of advanced batteries and battery systems, focusing on electrode materials, separators and electrolytes. Current materials challenges that must be met to further improve battery performance will be discussed.

List all co-listed courses: Include initials of Dept. Chair, if signature is not already included below.

- |    |    |    |
|----|----|----|
| 1) | 2) | 3) |
| 4) | 5) | 6) |

Department Chair: \_\_\_\_\_

(Chair Signature)

Date: 4/16/10

Discipline Specific Curricula Committee: \_\_\_\_\_

(Chair signature)

Date: 11/28/10

Curricula Committee: \_\_\_\_\_

(Chair Signature)

Date: \_\_\_\_\_

**MSE XXX**  
**MATERIALS & PROCESSING METHODS FOR ELECTROCHEMICAL DEVICES**  
**(4.0 HRS: 3.0 LEC; 1.0 LAB)**  
**SPRING 2011**

**Instructor (tentative):**

Robert W. Schwartz  
Professor, Department of Materials Science and Engineering  
Office: 110 Engineering Research Laboratory  
Ph. 573.341.7887  
Fax: 573.341.4979  
Email: [rschwartz@mst.edu](mailto:rschwartz@mst.edu)

**Office Hours and Appointments:**

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**Course Prerequisites:** Junior level standing in Engineering Technology (MSSU) or science or engineering (Missouri S&T)

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*Grading system:*

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4. Lithium ion batteries
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  - d. Metallic lithium alloys
5. Nickel metal hydride
  - a. Battery characteristics
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7. Supercapacitor technology
8. Fuel cell technology
  - a. Solid oxide
  - b. PEM

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	Peer Evaluation =	300 pts
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4. Battery power management
5. Cell chemistry effects
6. Use of DC methods for electrode characterization
7. Use of AC methods for electrode characterization
8. Use of DC methods for electrolyte characterization
9. Use of AC methods for electrolyte characterization

Effective Year: 2011

Effective Term: Summer ☐ Fall ☒ Spring ☐

EC File # 2309-FS2011-CS-401

## Experimental Course Form (EC)

This form must be filed with the Secretary to the Campus Curricula Committee, after the department chair's notation, by the appropriate deadline. Filing deadlines for inclusion in the initial release of the Schedule of Classes are as follows:

Summer and Fall Semester Offerings - January 1  
Spring Semester Offerings - August 1

An EC form must be submitted each semester it is to be offered, not to exceed two offerings. An experimental course that is required should be submitted on a CC form. Co-listed offerings should be submitted on one form, originating from the primary discipline.

Department: CS

Discipline and Course Number: CS401

Course Title: Cloud Computing

Abbreviated Title (24 spaces or less): Cloud Computing

Instructor(s): Sanjay Madria

Credit Hours: Lecture: 3 Lab: Total: 3

Prerequisites: Instructor's permission and knowledge of operating systems, databases, distributed computing, and a programming language

Semester(s) previously taught: none

### Brief Course Description: (40 words or less)

Cloud computing architecture, data management and indexing in cloud computing, security and privacy issues in cloud computing, scheduling and cost analysis, sensor and mobile cloud, Ajax/mapreduce and EC3 cloud

List all co-listed courses: Include initials of Dept. Chair, if signature is not already included below.

1) 2) 3)  
4) 5) 6)

Department Chair: \_\_\_\_\_

(Chair Signature)

Date: Nov 23, 2010

Discipline Specific Curricula Committee: \_\_\_\_\_

(Chair signature)

Date: 12/13/2010

Curricula Committee: \_\_\_\_\_

(Chair Signature)

Date: \_\_\_\_\_