MISSOURI S&T
MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY

Formerly University of Missouri-Rolla

Agenda
Campus Curricula Committee Meeting
November 2, 2011
12 a.m. Room 117 Fulton Hall

Approval of the October 05, 2011 minutes.

Review of submitted DC forms:
DC 0396, Biological Sciences, M.S., Applied and Environmental Biology, non-thesis option, effective Fall 2012. A proposal to modify the requirements for the M.S. in Applied and Environmental Biology, non-thesis option by removing Bio Sci 475.

DC 0398, Psychology, Minor in Psychology, effective Fall 2012. A proposal to modify the current curriculum for the minor in Psychology.

DC 0399, Psychology, BS and Secondary Education Emphasis area and BA and Secondary Education Emphasis area, effective Fall 2012. A proposal to modify the current curriculum for the above degrees and emphasis areas.

DC 0400, Business & Information Technology, Minor in IST, effective Fall 2012. A proposal to modify the current minor curriculum for the IST minor.

Review of submitted CC forms:
CC 8180, Political Science 50, Theories and Issues of Political Science, effective Fall 2012.

CC 8181, Psychology 312, Practicum in Human Services Psychology, effective Fall 2012.

CC 8182, Psychology 356, Behavior Modification, effective Fall 2012.

CC 8183, Psychology 376, Sports and Exercise Psychology, effective Fall 2012.

Review of submitted EC forms:
EC 2365, Chemistry 401, Organometallic Chemistry, effective Spring 2012.

EC 2370, Biological Sciences 401, Advanced Nanotechnology in Biomedicine, effective Fall 2012.

EC 2371, Biological Sciences 301, Nanotechnology in Biomedicine, effective Fall 2012.

1

Office of the Registrar • 103 Parker Hall • 300 West 13th Street • Rolla, MO 65409-0930
Phone: 573-341-4181 • Fax: 573-341-4362 • Email: registrar@mst.edu • Web: http://registrar.mst.edu

An equal opportunity institution

This fax was received by GFI FAXmaker fax server. For more information, visit: http://www.gfi.com

MISSOURI S&T

MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY

Formerly University of Missouri-Rolla

EC 2372, Computer Science 401, Network Information Analysis, effective Spring 2012.

EC 2374, Marketing 301, Consumer Behavior, effective Spring 2012.

EC 2375, Computer Science, Introduction to Computational Perception and Cognition, effective Spring 2012.

EC 2376, Political Science 301, Middle East Politics, effective Fall 2012.

EC 2378, Art 201, Chinese Brush Painting and Calligraphy, effective Spring 2012.

Tabled Items:
DC 0392, Aerospace Engineering, Bachelor of Science, effective Fall 2011. **Tabled**

New Business:
The committee will be discussing the policy on skipping the EC stage and also on co-listing procedures.

2

Effective Year: 2012
Effective Term: Summer ☐   **Fall** ☒   **Spring** ☐
(Creating or modifying a degree program must be effective for a Fall term)

DC #*0396-2011- BioSci -00-00*

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:
M.S., Applied and Environmental Biology, non-thesis option

Department: Biological Sciences

Briefly describe action requested (Attach documentation as appropriate):
We have decided that Techniques in Modern Biology (BioSci 475) should not be required for the non-thesis degree students.   Thus, we seek approval to remove it from the requirements for the non-thesis option. The other requirements (BioSci 402 and 410, 30 total hours of coursework) remain the same.

Recommended by Department: _____   Date: 8/26/11
                                          (Chair/signature)

Recommended by: _____   Date: 7/21/2011
Discipline Specific Curricula Committee   (Chair signature)

Approved by Curricula Committee: _____   Date: _____
                                          (Chair signature)

Approved by Faculty Senate: _____   Date: _____
                                          (Chair signature)

08/24/11   (Revised 1/31/2008)

Effective Year: 2012

DC # *0398-2011-Psych-000-00*

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

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:
Psychology Minors

Department: Psychological Science

Briefly describe action requested (Attach documentation as appropriate):

The department requests that anyone completing a minor in psychology completes nine (9) hours of psychology at Missouri S&T. In addition, a student may only receive one minor.

In the catalog under Psychology Minors, it currently reads:
The Psychology department offers five minors: a general minor, an Industrial/Organizational minor, Psychology of Leadership minor, a minor in Cognitive Neuroscience, and a minor in Psychometrics. "At least 6 hours of work in the Psychology Minor must be completed in residence at Missouri S&T."

With these changes and corrections, we request that the paragraph read:

The Department of Psychological Science offers six minors: a general minor, an Industrial/Organizational minor, Psychology of Leadership minor, a minor in Cognitive Neuroscience, a minor in Psychometrics, and a minor in Multiculturalism and Diversity. Nine (9) hours of work in the Psychology Minor must be completed in residence at Missouri S&T. A student may only receive one of the six minors.

(Our department's name change was approved February 2008 and the Multiculturalism & Diversity minor was approved within the past few years.)

Recommended by Department: _Nancy A Stone_   Date: _9/28/11_
(Chair signature)

Recommended by: _Berry Chalybist_   Date: _10/5/11_
Discipline Specific Curricula Committee   (Chair signature)

Approved by Curricula Committee: _____   Date: _____
(Chair signature)

Approved by Faculty Senate: _____   Date: _____
(Chair signature)

09/27/11   (Revised 9/12/2011)

Effective Year: 2012   DC # *0399-2011- Psych -000 -00*
Effective Term: Summer ☐   **Fall** ☒   **Spring** ☐
(Creating or modifying a degree program must be effective for a Fall term)

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:
Bachelor of Science Psychology
Bachelor of Science Psychology (Secondary Education Emphasis)
Bachelor of Arts Psychology
Bachelor of Arts Psychology (Secondary Education Emphasis

Department: Psychological Science

Briefly describe action requested (Attach documentation as appropriate):
The department is requesting the deletion of the following elective classes from the curriculum and course catalog. These courses are not being taught, are not required courses, and do not fit into the current vision and mission of the department. In addition, one of the courses is a duplicate of another one currently taught and some of the material in these courses is taught in other current courses.

Delete the following courses from the catalog:

    Psych 312 – Practicum in Human Services Psychology
    Psych 356 – Behavior Modification
    Psych 376 – Sports and Exercise Psychology

Recommended by Department: _____   Date: _9/28/11_
                                          (Chair signature)

Recommended by: _____   Date: _10/5/11_
Discipline Specific Curricula Committee   (Chair signature)

Approved by Curricula Committee: _____   Date: _____
                                          (Chair signature)

Approved by Faculty Senate:_____   Date: _____
                                          (Chair signature)

09/27/11   (Revised 9/12/2011)

Psychology
Bachelor of Science
Bachelor of Arts

Psychology is the scientific study of behavior and cognative processes. Psychology is both a natural science, which stresses the cognitive and physiological causes of behavior, and a social science, which is directed at understanding how human behavior is affected by cultural and social factors. As a Psychology major at Missouri S&T, you will be exposed to the many diverse areas of Psychology.

Perception, memory, thinking, personality, emotion, motivation, stress and adjustment, abnormal behavior, social relations, and group dynamics are among the basic areas of research in Psychology. The discipline also represents the application of these basic research areas to people, their work, and their environment. Clinical, counseling, educational, industrial/organizational, and human factors psychologists are among the professionals who apply basic research to the solution of human problems. Our department provides a broad education to Missouri S&T students in both the basic and applied areas of Psychology.

The statistics and research methods courses required of our majors prepare you to engage in undergraduate research in your junior or senior years. By collaborating with a faculty member on a research project, you will gain valuable experience for subsequent graduate studies in psychology and related fields or for employment. Supervised practicum experience in applied psychological settings, such as human service agencies, is also available for qualified students.

The department offers a choice of two degrees for majors. The Bachelor of Science degree provides a solid foundation in mathematics, biological sciences, physical sciences, and computer science. The Bachelor of Arts degree provides a broad liberal arts foundation, including courses in western civilization and foreign languages. Supporting courses in the humanities and social sciences are offered in both degrees and the psychology requirements are the same in both. In addition to the traditional B.A.-B.S. degrees in Psychology, the department also offers specialized B.A.-B.S. degrees in Psychology that prepare the student for teaching certification in Missouri.

The department also offers six minor programs: a general psychology minor, a minor in industrial/organizational psychology, a minor in the psychology of leadership, a minor in cognitive neuroscience, a minor in psychometrics, and a minor in multiculturalism and diversity. The general psychology minor allows students to select from a variety of courses tailored to their needs. The minor in industrial/organizational psychology requires specific courses of benefit to engineering and science majors. The minor in the psychology of leadership is geared for those individuals who would like to become leaders and managers. The cognitive neuroscience minor is designed to give students a broad understanding of neuroscience principles. The minor in psychometrics helps students better understand the application of statistical methods to the measurement of human characteristics and individual differences. The multicultural and diversity minor allows students to select courses across three of four departments, including Psychological Science, to increase their awareness of multiculturalism and diversity.

Faculty

Professors:
Frances Haemmerlie, (Curators' Teaching Professor) Ph.D., Florida State University
Robert Montgomery, Ph.D., Oklahoma State University
Nancy J. Stone (Department Chair), Ph.D., Texas Tech University
Associate Professors:
Donald Sharpsteen, Ph.D., University of Denver
Assistant Professors:
Jacqueline Bichsel, Ph.D., University of Alabama
Amber M. Henslee, Ph.D., Auburn University
Assistant Teaching Professor:
Merilee Krueger, M.A., University of Nebraska-Omaha
Instructors:
Eugene Gianladis, Ph.D., St. Louis University

Bachelor of Arts
Psychology

A minimum of 120 credit hours is required for a Bachelor of Arts degree in Psychology and an average of at least two grade points per credit hour must be obtained. The Psychology B.A. curriculum requires 23 hours of basic skills and concepts. That is, 6 hours of English Composition, 6 hours of Western Civilization, and 11-16 hours of foreign language. Twelve semester hours in humanities must be taken with at least one course taken in each of the three areas of literature (English and American) , philosophy, and fine arts (art, music and theater), but not to include studio and performance offerings. A minimum of twelve semester hours is required in social sciences in at least two of the following three areas: economics, political science, and history. And a minimum of 34 hours are required in psychology. Up to 12 credit hours of advanced ROTC may be credited toward the degree. Specific requirements for the Bachelor of Arts degree are outlined in the sample program listed below.

1) English 20 and one additional three hour composition course (6 hours).
2) Western Civilization (History 111 and 112) (6 hours).
3) Foreign languages for at least 3 semesters of basic study in French, German, Russian, Spanish or an approved substitute; or one year of basic study in one foreign language in either French, German, Russian, Spanish, or an approved substitute , and a humanities or social sciences course taught in a foreign country and employing the language of that

240 — Psychology

country; or one year of basic study in each of two of the foreign languages of French, German, Russian or Spanish or an approved substitute (11-16 hours).

4) Sciences. At least one course taken in biological (biological sciences) and physical (chemistry, geology and geophysics, physics) sciences. At least one statistics course. A laboratory course is required (and a lab offered in engineering also may count at the discretion of the student's major advisor) toward the total requirement (12 hours).

5) Humanities and fine arts. Courses used to satisfy this requirement must include one course in each of the three areas of literature (English or American), philosophy, and fine arts (art, music or theater), but not to include studio and performance offerings (12 hours).

6) Social Sciences. At least two of the following social science areas are to be included: economics, political science, or history (12 hours).

7) Psychology (34 hours):
   A) Introduction to Psychology, General Psychology Research Methods and Capstone course (Psy 302, 310, 312, 350, 375, 380, or 390, 3 hours credit).
   B) Three additional courses from each of the following two areas of psychology:
   a) Sensation & Perception, Cognitive, Learning, Neuroscience, Developmental, Abnormal, Social, or Personality
   b) Educational, Adolescent, Human-Commputer Interaction, Industrial, Human Factors, Clinical, Group Dynamics, or Organizational
   C) Electives from Psychology to complete the 34 hour major requirement.

8) Major-field requirements: A cumulative grade point average of 2.0 must be earned in all course work taken in the major field. Upper-class (200-300-level) courses completed with grades of "D" may not be included in the major field without the approval of the chair of the department. At least nine hours of upper-class work in the major field must be completed in residence at Missouri S&T.

9) Minor: A minor will be selected from any discipline other than the major with the approval of the student's advisor. A total of at least 15 hours is required for the minor, but may include courses, which also satisfy other requirements. At least nine hours must be beyond the introductory level. A cumulative grade point average of 2.0 must be earned in all course work required in the minor field. At least six hours of work in the minor field must be completed in residence at Missouri S&T.

10) Basic ROTC may be elected in the freshman and sophomore years, but is not creditable toward a degree. Up to 12 credit hours of advanced ROTC may be credited toward a degree.

11) Elective Credits: In consultation with his/her advisor, each student will elect sufficient additional courses to complete a minimum of 120 credit hours.

Bachelor of Science Psychology

A minimum of 124 credit hours is required for a Bachelor of Science degree in Psychology and an average of at least two grade points per credit hour must be obtained. These requirements for the B.S. degree are in addition to credit received for basic ROTC.

The Psychology Bachelor of Science curriculum requires six hours of English composition; 23 hours of math, science and computer science; and twelve semester hours in humanities. Specific requirements for the bachelor degree are outlined in the sample program listed below.

1) English 20 and 60 (entering students will normally take English 20 either semester of the first year.) (6 hours)

2) A total of 23 hours in biological, physical, (chemistry, geology and geophysics, and physics), and mathematical (mathematics/statistics and computer science or information science & technology) sciences, to include Stat 115, Cmp Sc 53 or 73 or IST 51 and at least one course taken in the biological and one in the physical sciences. Of the biological and physical science offering, at least one must be a laboratory course. Engineering courses may, at the discretion of the student's major advisor, also count toward this total requirement. (23 hours)

3) 12 hours in humanities and fine arts (literature, philosophy, art, music, or theater). Foreign language courses may count toward fulfilling this requirement. Courses used to satisfy this requirement must be taken in at least two humanities areas. (12 hours)

4) 12 hours in at least two social sciences fields outside the major area (economics, sociology, or history/political science). A course in Western Civilization II (Hist 112), American History to 1877 (Hist 175) or American History since 1877 (Hist 176), or American Government (Pol Sc 90) must be taken to satisfy the requirement of the state of Missouri (the "Williams Law"), and this course may count toward fulfilling the social sciences requirement. (12 hours)

5) Minor: A minor will be selected from any discipline other than the major with the approval of the student's advisor. A total of at least 15 hours is required for the minor, but may include courses, which also satisfy other requirements. At least nine hours must be beyond the introductory level.

6) Basic ROTC may be elected in the freshman and sophomore years, but is not creditable toward a degree. Six credit hours of advanced ROTC may be credited toward a degree.

7) Elective Credits: In consultation with his/her advisor, each student will elect sufficient additional courses to complete a minimum of 124 credit hours which may include Math 2 or 4 and Math 6.

8) Psychology Requirements:

A) Introduction to Psychology, General Psychology, Research Methods and Capstone course (Psych 302, 310, 312, 350, 375, 380, or 390, 3 hours credit).

B) Three additional courses from each of the following two areas of Psychology:
   a) Sensation & Perception, Cognitive, Learning, Neuroscience, Developmental, Abnormal, Social, or Personality
   b) Educational, Adolescent, Human-Computer Interaction, Industrial, Human Factors, Clinical, Group Dynamics, or Organizational

C) Electives from Psychology to complete a requirement of 34 hours.

D) A cumulative grade point average of 2.0 must be earned in all course work taken in the major field. Upper class (200- and 300- level) courses completed with grades of "D" may not be included in the major field without the approval of the advisor and the chair of the department concerned.

Emphasis Areas

Note: The following areas identify courses from which a student may opt to develop an emphasis area. It is not required that students obtain an emphasis specialty within Psychology.

Human Resources/Personnel	Credit
Psych 307-Industrial Psychology	3
Psych 308-Social Psychology	3
Psych 372-Group Dynamics	3
Psych 374-Organizational Psychology	3

Human Services
Psych 208-Psych & Ed Dev Adolescent or Psych 250-Development Psych 3
Psych 362-Abnormal Psychology 3
Psych 360-Personality Theory 3
Psych 368-Clinical Psychology 3

Cognitive Neuroscience
Psych 340-Sensation & Perception 3
Psych 240-Theories of Learning or Psych 262-Abnormal Psych 3
Psych 305-Cognitive Psychology 3
Psych 330-Neuroscience .3

Usability of Technology
Psych 155-Educational Psychology 3
Psych 211-Web Design and Development 3
Psych 311-Human Factors 3
Psych 314-Human-Computer Interaction 3

Psychology of Leadership
Psych 308-Social Psychology or Psych 378-Social Influence 3
Psych 316-Psychology of Leadership 3
Psych 350-Psychology of Women or Psych 372-Group Dynamics 3
Psych 374-Organizational Psychology 3

Bachelor of Arts Psychology (Secondary Education Emphasis Area)

You may earn a B.A. degree in Psychology from Missouri S&T and certification to teach at the secondary level in the schools of Missouri with the Secondary Education emphasis area program. This program can be completed in four academic years and student teaching is arranged with public schools within 30 miles of the Rolla campus.

Students interested in this emphasis area should consult with the advisor for the Secondary Education Emphasis Area in the Department of Psychological Science.

In order to successfully complete this emphasis area, students must have at least 22 on the ACT, maintain a cumulative GPA of at least 2.5, and attain at least a 2.5 GPA in all Psychology courses. Current Missouri S&T or transfer students who wish to pursue this emphasis area must meet both of these GPA requirements to be accepted into the program. Students must also meet all requirements listed under the Teacher Education Program in this catalog. Students who do not meet all the teacher certification requirements will not be eligible for the Secondary Education Emphasis Area, even if they have completed all course work.

A degree with this emphasis area requires 128 credit hours. The required courses are provided below.

Communications Skills: 9 semester hours
English 20, English 60, Speech 85
Humanities: 12 semester hours
One must be in Art, Music, or Theatre (3 hours); one must be in Philosophy (3 hours) and in Literature (3 hours); and one additional humanities from the above course groups, Foreign Language (3-4 hours), or Etymology (3 hours)
Social Sciences: 18 semester hours
History 175 or 176, Political Science 90, Political Science 237, 250, 290, 315 or 316, Psychology 50, Economics 121 or 122, Geography (3 hours)
Natural Science/Mathematics: 13 semester hours
Physics, Chemistry or Geology (3-4 hours), Mathematics (3 hours), Biology 110 (3 hours), Statistics 115 (3 hours)
Professional Requirements: 26 semester hours
Educ 40, Educ 174, Educ 216, Educ 251, Educ 280, Educ 298, Psych 155, Psych 208, Psych 354
Clinical Experience: 16 semester hours
Educ 104, Educ 164, Educ 299
Psychology Degree Requirements: 17 semester hours
Psych 10, Psych 140, Psych 240, Psych 250, Psych 362 or 360, Psych 308
Certification: 17 semester hours
9 hours of American History (Hist 341, 342, 343, 344, 347, 348, 351, 353, 354, 355, 357, 358, 360, 370, 380, 382, 383, or 385); 8 hours of World History (Hist 111, 112, 220, 222, 224, 225, 226, 321, 323, 324, 325, 327, 328, or 329)

242 — Psychology

Bachelor of Science Psychology (Secondary Education Emphasis Area)

You may earn a B.S. Degree in Psychology from Missouri S&T and certification to teach at the secondary level in the schools of Missouri with the Secondary Education emphasis area program. This program can be completed in four academic years and student teaching is arranged with public schools within 30 miles of the Rolla campus.

Students interested in this emphasis area should consult with the advisor for the Secondary Education Emphasis Area in the Department of Psychological Science.

In order to successfully complete this emphasis area, students must have at least 22 on the ACT, maintain a cumulative GPA of at least 2.5, and attain at least a 2.5 GPA in all Psychology courses. Current Missouri S&T or transfer students who wish to pursue this emphasis area must meet both of these GPA requirements to be accepted into the program. Students must also meet all requirements listed under the Teacher Education Program in this catalog. Students who do not meet all the teacher certification requirements will not be eligible for the Secondary Education Emphasis Area, even if they have completed all course work.

A degree in this emphasis area requires 136 credit hours. The required courses are provided below.

Communications Skills: 9 semester hours
English 20, English 60, Speech 85
Humanities: 12 semester hours
One must be in Art, Music, or Theatre (3 hours); one must be in Philosophy (3 hours) and in Literature (3 hours); and one additional humanities from the above course groups, Foreign Language (3-4 hours), or Etymology (3 hours)
Social Sciences: 18 semester hours
History 175 or 176, Political Science 90, Political Science 237, 250, 290, 315 or 316, Psychology 50, Economics 121 or 122, Geography (3 hours)
Natural Sciences/Mathematics: 21 semester hours
Physics, Chemistry or Geology (3-4 hours), Mathematics (3 hours), Biology 110, Statistics 115, Computer Science 53, 73, or 77, 5-6 additional hours of Math &/or Science courses
Professional Requirements: 26 semester hours
Educ 40, Educ 174, Educ 216, Educ 251, Educ 280, Educ 298, Psych 155, Psych 208, Psych 354
Clinical Experience: 16 semester hours
Educ 104, Educ 164, Educ 299
Psychology Degree Requirements: 17 semester hours
Psych 10, Psych 140, Psych 240, Psych 250, Psych 362 or 360, Psych 308

Certification: 17 semester hours
9 hours of American History (Hist 341, 342, 343, 344, 347, 348, 351, 353, 354, 355, 357, 358, 360, 370, 380, 382, 383, or 385); 8 hours of World History (Hist 111, 112, 220, 222, 224, 225, 226, 321, 323, 324, 325, 327, 328, or 329)

Psychology Minors

The Psychology department offers five minors: a general minor, an Industrial/Organizational minor, Psychology of Leadership minor, a minor in Cognitive Neuroscience, and a minor in Psychometrics. "At least 6 hours of work in the Psychology Minor must be completed in residence at Missouri S&T"

Option (1)
General Psychology Minor requirements require 15 hours of courses in Psychology. At least nine of these hours must be at the 200-level or above.
Option (2)
Industrial/Organizational Psychology Minor requirements include:
- General Psychology (Psych 50)
- Industrial Psychology (Psych 307)
- Social Psychology (Psych 308)
- Human Factors (Psych 311)
- Organizational Psychology (Psych 374)
Option (3)
Psychology of Leadership requirements include General Psychology any 4 of the following 5 courses:
- Social Psychology (Psych 308)
- Psychology of Leadership (Psych 316)
- Group Dynamics (Psych 372)
- Organizational Psychology (Psych 374)
- Social Influence: Science and Practice (Psych 378)
Option (4)
Cognitive Neuroscience Minor requirements include:
- General Psychology (Psych 50)
- Sensation and Perception (Psych 340)
- Cognitive Psychology (Psych 305)
- Neuroscience (Psych 330)
- Abnormal Psychology (Psych 362) or Theories of Learning (Psych 240)
Option (5)
The Psychometric Minor requirements include the following courses:
- General Psychology (Psych 50)
- Psychometrics (Psych 403)
- Industrial Psychology (Psych 307)
- Tests and Measurements (Psych 364)
- Regression Analysis (Stat 346) or Statistical Data Analysis (Stat 353)
Option (6)
Multiculturalism and Diversity Minor
See website for minor requirements at: futurestudents.mst.edu/degrees/undergraduate/minors/multidiv.html

Psychology Courses

10 Introduction to Psychology (LEC 1.0) An introduction to the study of psychology at S&T. Students will learn about personal and professional opportunities associated with the different areas of psychology and become

Effective Year: 2012   **DC #** 0400-2011-IST-000-00
Effective Term: Summer ☐   Fall ☒   Spring ☐
(Creating or modifying a degree program must be effective for a Fall term)

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:
Minor: IST

Department: Business & Information Technology

Briefly describe action requested (Attach documentation as appropriate):
The existing Minor in IST requires IST 50, IST 51, IST 151, ERP 246 and
one IST 2xx or above course.

The change is to allow the 5th course to be any IST or ERP course at the 200- or 300-level.

Thus the Minor would now require:
    IST 50 Introduction to Management Information Systems
    IST 51 Implementing Information Systems: User Perspective
    IST 151 Implementing Information Systems: Data Perspective
    ERP 246 Introduction to Enterprise Resource Planning
    One other IST or ERP designated course at the 200 level or above.

Recommended by Department: _____   Date: _10/5/11_
                                                  (Chair signature)

Recommended by: _____   Date: _10/5/11_
Discipline Specific Curricula Committee   (Chair signature)

Approved by Curricula Committee: _____   Date: _____
                                                  (Chair signature)

Approved by Faculty Senate: _____   Date: _____
                                                  (Chair signature)

10/03/11   (Revised 1/31/2008)

Effective Year: 2012   CC File # *8180 -2011- PolSci - 235-3*
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   *Pol Sci*   *Pol Sci*

2. **Discipline and Course Number:**   **Present :** 235   **Proposed:** 50

3. **Course Title: Present: Theories and Issues of Political Science**
   Proposed: Introduction to Political Science

   Abbreviated Course Title: Intro. to Pol. Science
   (24 Spaces or Less. Only needed for New Courses or Title Changes.)

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

   Present: This course will introduce the student to the fundamental concepts and phenomena of political life and to the variety of political organizations characteristic of the modern age.

   Proposed: Same as above

5. **If course requires field trip check box:** ☐

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

7. **Prerequisites:**
   Present: Pol. Sci. 90 or Hist 175 or 176

   Proposed: None

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

9. **Justification:** This is a course, unlike Pol. Sci. 90 which introduces students to American government, which introduces students to political life generally. That is, it explores non-American governmental systems and thought as well as American. The department believes it best to offer it as a general introduction to the discipline of Political Science.

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 _____   Date: _5/28/11_
                                    (Chair signature)
Recommended by Discipline Specific Curricula Committee _____   Date: _10/3/2011_
                                    (Chair signature)
Approved by Curricula Committee: _____   Date: _____
                                    (Chair signature)
Approved by Faculty Senate: _____   Date: _____
                                    (Chair signature)

(Revised 1/29/09)

Effective Year: 2012

Term: Summer ☐   **Fall** ☒   **Spring** ☐

CC File # *8181- 2011- Psych -312-20*

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:** Psychological Science

2. **Discipline and Course Number:**   **Present :** Psych 312   **Proposed:**

3. **Course Title:**   **Present:**   Practicum in Human Services Psychology
                          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: Practicum involves experience in a human service setting. Depending on the student background and setting, activities may involve learning psychological testing, interviewing, assessment and/or counseling skills. Prerequisities: Psych 50; Psych 356, 362, 364, or 368.

   Proposed:

5. **If course requires field trip check box:** ☐

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

7. **Prerequisites:**
       Present: Psych 50, Psych 356, 362, 364, or 368

       Proposed:

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

9. **Justification:**   The department does not currently teach the course and it duplicates the Intership (Psych 302) 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 ___*Nancy Stone*___   Date: __9/28/11__
                          (Chair signature)

Recommended by Discipline Specific Curricula Committee _____   Date: __10/5/11__
                          (Chair signature)

Approved by Curricula Committee: _____   Date: _____
                          (Chair signature)

Approved by Faculty Senate: _____   Date: _____
                          (Chair signature)

(Revised 1/29/09)

Effective Year: 2012   **CC File #** *8182-2011-Psych-356-20*
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:** Psychological Science

2. **Discipline and Course Number:**   **Present :** Psych 356   **Proposed:**

3. **Course Title:**   **Present:**   **Behavior Modification**
                     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: Theory and techniques of influencing human behavior through the use of behavior modification and behavior therapy techniques. Applications to normal and abnormal child, adolescent and adult populations will be considered as well as ethical and legal issues. Prerequisite: Psych 50..

   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: Psych 50

   Proposed:

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

9. **Justification:**   The department does not currently teach the course and it does not fit will with the current vision and mission.

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 *Nancy Stone*   Date: *9/28/11*
                    (Chair signature)

Recommended by Discipline Specific Curricula Committee *(signature)*   Date: *10/5/11*
                    (Chair signature)

Approved by Curricula Committee: _____   Date: _____
                    (Chair signature)

Approved by Faculty Senate: _____   Date: _____
                    (Chair signature)

(Revised 1/29/09)

Effective Year: 2012

Term: Summer ☐   Fall ☒   Spring ☐

CC File # *8183-2011-Psych-376-20*

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:** Psychological Science

2. **Discipline and Course Number:** Present : Psych 376   Proposed:

3. **Course Title:** Present: **Sports and Exercise Psychology**
   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: Examines psychological theories and research related to sport and exercise behavior by providing a broad overview of topics from the literature of psychology.

   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: Psych 50

   Proposed:

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

9. **Justification:** The department does not currently teach the course and it does not fit will with the current vision and mission.

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 __*Nancy A Stone*__   Date: *9/28/11*
                              (Chair signature)

Recommended by Discipline Specific Curricula Committee *[signature]*   Date: *10/5/11*
                              (Chair signature)

Approved by Curricula Committee: _____   Date: _____
                              (Chair signature)

Approved by Faculty Senate: _____   Date: _____
                              (Chair signature)

(Revised 1/29/09)

New form

Effective Year: 2012
Effective Term: Summer ☐   Fall ☐   Spring ☒

EC File #*2365 - Sp2012 - Chem - 401*

Experimental Course Form (EC)

An EC form must be submitted before an experimental course is to be offered. EC forms approved SP2009 or later allow the course to be offered twice at any time during the following three year period. After an experimental course has been offered twice, a CC form may be submitted to request a permanent course number.

A new course that is required as part of a degree program, minor, or graduate certificate may be submitted on a CC form to receive a permanent course number

Co-listed offerings should be submitted on one form, originating from the primary discipline.

Department: Chemistry

Discipline and Course Number: Chem 401

Course Title: Organometallic Chemistry

Abbreviated Title *(24 spaces or less)*: Organometallic Chemistry

Instructor(s): Pericles Stavropoulos

Credit Hours: **Lecture:** 3   **Lab:**   **Total:** 3

Prerequisites: Chem 331 ~~or consent of instructor~~

Semester(s) previously taught: FS2009

Brief Course Description: (40 words or less)
This course will cover the use of transition metal in organic synthesis with particular emphasis placed on issues of selectivity (regioselectivity and stereoselectivity).

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: _____   Date: _9-15-2011_
                                    (Chair Signature)

Discipline Specific Curricula Committee: _____   Date: _9/21/2011_
                                    (Chair Signature)

Curricula Committee: _____   Date: _____
                                    (Chair Signature)

09/14/11   (Revised 10/12/2010)

EC File # *2370 - FS2012 - BioSci - 401*

Effective Year: 2012
Effective Term: Summer ☐ **Fall** ☒ **Spring** ☐

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: Biological Sciences

Discipline and Course Number: *BioSc* 401

Course Title: ~~Special Topics:~~ Advanced Nanotechnology in Biomedicine

Abbreviated Title (24 spaces or less): Adv Nanobiotechnology

Instructor(s): Yue-Wern Huang

Credit Hours: **Lecture:** 2   **Lab:** 0   **Total:** 2

Prerequisites: ~~One biology course at college level~~ *CHEM 361 OR ANY 300 LEVEL OR HIGHER BIOCHEMISTRY COURSE*

Semester(s) previously taught: 0

Brief Course Description: (40 words or less)
Applications of nanotechnology in life science is termed nanobiotechnology. This course describes recent development of nanotechnology in basic biological research as well as biomedical applications. In addition to attending regular lectures, graduate students will be assigned to an independent research project and present the information in the class.

List all co-listed courses: Include initials of Dept. Chair, if signature is not already included below.
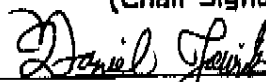1)   2)   3)

4)   5)   6)

Department Chair: _____   **Date:** 9/13/11
(Chair Signature)

Discipline Specific Curricula Committee: _____   **Date:** 10/11/2011
(Chair signature)

Curricula Committee: _____   **Date:** _____
(Chair Signature)

(Revised 1/31/2008)

09/12/11

Effective Year: 2012
Effective Term: Summer ☐   Fall ☒   Spring ☐

EC File # *2371- FS2012 - BioSci -301*

Experimental Course Form (EC)

An EC form must be submitted before an experimental course is to be offered. EC forms approved SP2009 or later allow the course to be offered twice at any time during the following three year period. After an experimental course has been offered twice, a CC form may be submitted to request a permanent course number.

A new course that is required as part of a degree program, minor, or graduate certificate may be submitted on a CC form to receive a permanent course number

Co-listed offerings should be submitted on one form, originating from the primary discipline.

Department: Biological Sciences

Discipline and Course Number: *Bio Sc* 301

Course Title: ~~Special Topcis:~~ Nanotechnology in Biomedicine

Abbreviated Title *(24 spaces or less)*: Nanobiotechnology

Instructor(s): Yue-Wern Huang

Credit Hours: Lecture: 2   Lab: 0   Total: 2

Prerequisites: One biology course at college level and sophomore or higher *STANDING*

Semester(s) previously taught: 1 — *FS 2010*
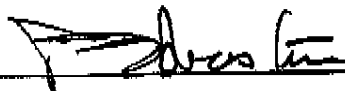
Brief Course Description: (40 words or less)
Nanotechnology has changed human economy and society in many aspects. Applications of nanotechnology in life science is termed nanobiotechnology. This course describes recent development of nanotechnology in fundamental biological research as well as biomedical applications.

List all co-listed courses: Include initials of Dept. Chair, if signature is not already included below.
1)   2)   3)

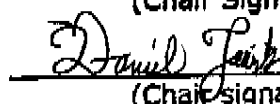4)   5)   6)

Department Chair: _____   Date: *9/12/11*
                                    (Chair Signature)

Discipline Specific Curricula Committee: _____   Date: *16/11/2011*
                                    (Chair signature)

Curricula Committee: _____   Date: _____
                                    (Chair Signature)

(Revised 10/12/2010)

09/12/11

Effective Year: 2012
Effective Term: Summer ☐   Fall ☐   Spring ☒

EC File #2372-2p2012-C'5-401

Experimental Course Form (EC)

An EC form must be submitted before an experimental course is to be offered. EC forms approved SP2009 or later allow the course to be offered twice at any time during the following three year period. After an experimental course has been offered twice, a CC form may be submitted to request a permanent course number.

A new course that is required as part of a degree program, minor, or graduate certificate may be submitted on a CC form to receive a permanent course number

Co-listed offerings should be submitted on one form, originating from the primary discipline.

Department: Computer Science

Discipline and Course Number: CS401

Course Title: Network Information Analysis

Abbreviated Title (24 spaces or less): Network Analysis

Instructor(s): Maggie Cheng

Credit Hours: Lecture: 3   **Lab:** 0   **Total:** 3

Prerequisites: CS325, CS365

Semester(s) previously taught: 0

Brief Course Description: (40 words or less)
This course covers modeling techniques and analytical methods to study the interaction of information and networks. The two main focuses are (1) models and properties of network structures;(2) diffusion of information over networks. The expected outcomes are systematic inference of information encoded in network structures, and effective methods to disseminate or gather information from networks.

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: _____   Date: _____
                              (Chair Signature)

Discipline Specific Curricula Committee: _____   Date: 10/11/2011
                              (Chair signature)

Curricula Committee: _____   Date: _____
                              (Chair Signature)

(Revised 10/12/2010)

08/23/11

Effective Year: 2012
Effective Term: Summer ☐   Fall ☐   Spring ☒

EC File # 2374-SP2012-MKT-301

Experimental Course Form (EC)

An EC form must be submitted before an experimental course is to be offered. EC forms approved SP2009 or later allow the course to be offered twice at any time during the following three year period. After an experimental course has been offered twice, a CC form may be submitted to request a permanent course number.

A new course that is required as part of a degree program, minor, or graduate certificate may be submitted on a CC form to receive a permanent course number

Co-listed offerings should be submitted on one form, originating from the primary discipline.

Department: Business & Info Tech

Discipline and Course Number: MKT 301

Course Title: Consumer Behavior

Abbreviated Title (24 spaces or less): Consumer Behavior

Instructor(s): Nobuyuki Fukawa

Credit Hours: **Lecture:** 3   **Lab:**   **Total:** 3

Prerequisites: MKT 311

Semester(s) previously taught:

Brief Course Description: (40 words or less)
Introduces and applies important concepts, principles, and theories to understand consumer decision-making processes in the purchase, usage and disposal of goods and services. Examines the influence of cultural, social, and psychological factors on consumer behavior.

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: 9/20/11

Discipline Specific Curricula Committee: _____ (Chair signature)   Date: 9/21/11

Curricula Committee: _____ (Chair Signature)   Date: _____

09/20/11

(Revised 10/12/2010)

Effective Year: 2012
Effective Term: Summer ☐   Fall ☐   Spring ☒

EC File # *2375-Sp2012-CS-301*

Experimental Course Form (EC)

An EC form must be submitted before an experimental course is to be offered. EC forms approved SP2009 or later allow the course to be offered twice at any time during the following three year period. After an experimental course has been offered twice, a CC form may be submitted to request a permanent course number.

A new course that is required as part of a degree program, minor, or graduate certificate may be submitted on a CC form to receive a permanent course number

Co-listed offerings should be submitted on one form, originating from the primary discipline.

Department: Computer Science

Discipline and Course Number: Cmp Sc 301

Course Title: Introduction to Computational Perception and Cognition

Abbreviated Title (24 spaces or less): Intro Comp Percp & Cogn

Instructor(s): Zhaozheng Yin

Credit Hours: **Lecture:** 3   **Lab:**   **Total:** 3

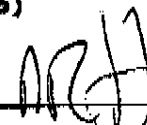**Prerequisites:**   Math 203/208, Cmp Sc 253

Semester(s) previously taught: None

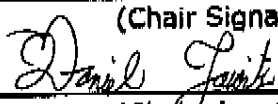**Brief Course Description: (40 words or less)**
This course introduces foundational theories and analysis methods in computational visual perception and cognition. Topics will include image formation, camera model and geometry, description of visual features, shape analysis, stereo reconstruction, motion and video processing, and visual object recognition.

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: _____   Date: Sep 19, 11
                              (Chair Signature)

Discipline Specific Curricula Committee: _____   Date: 10/11/2011
                              (Chair signature)

Curricula Committee: _____   Date: _____
                              (Chair Signature)

(Revised 10/12/2010)

09/19/11

Effective Year: 2012
Effective Term: Summer ☐   Fall ☒   Spring ☐

EC File # *2376 - FS2012 - PolSci-30*

Experimental Course Form (EC)

An EC form must be submitted before an experimental course is to be offered. EC forms approved SP2009 or later allow the course to be offered twice at any time during the following three year period. After an experimental course has been offered twice, a CC form may be submitted to request a permanent course number.

A new course that is required as part of a degree program, minor, or graduate certificate may be submitted on a CC form to receive a permanent course number

Co-listed offerings should be submitted on one form, originating from the primary discipline.

Department: History and Political Science

Discipline and Course Number: Pol. Sci. *- 301*

Course Title: Middle East Politics

Abbreviated Title (24 spaces or less): Middle East Politics

Instructor(s): Dr. Tseggai Isaac

Credit Hours: Lecture: 3   **Lab:**   **Total:**

Prerequisites: Political Science 90

Semester(s) previously taught: *NA*

Brief Course Description: (40 words or less)
Middle East Politics is a comprehensive study of the political systems, institutions, regimes, and ideological beliefs of the countries of the Middle East. Diplomacy, nationalism, economic systems, and terrorism will be covered. Prerequisite: Political Science 90, American Government.

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:_____   Date: _5/28/11_
                          (Chair Signature)

Discipline Specific Curricula Committee: _____   Date: _10/3/2011_
                                (Chair signature)

Curricula Committee:_____   Date: _____
                          (Chair Signature)

(Revised 10/12/2010)

09/27/11

Effective Year: 2012
Effective Term: Summer ☐   Fall ☐   Spring ☒

EC File # *2378- Sp2012 - Art - 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: Department of Arts, Languages and Philosophy

Discipline and Course Number: Art 201

Course Title: Chinese Brush Painting and Calligraphy

Abbreviated Title *(24 spaces or less)*: Chinese Brush Painting

Instructor(s): Leong, Lampo

Credit Hours: **Lecture:** 1   **Lab:** 2   **Total:** 3

Prerequisites: None

Semester(s) previously taught: N/A

Brief Course Description: (40 words or less)
Chinese brush painting uses expressive strokes to portray the essence of a given subject while simultaneously revealing the spirit of the artist. Open to students of all levels, this course explores the concepts, history, and techniques related to this artistic medium.

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: _____   Date: 50/ 28 //
                              (Chair Signature)

Discipline Specific Curricula Committee: _____   Date: Sept 28, 2011
                                                      (Chair signature)

Curricula Committee: _____   Date: _____
                              (Chair Signature)

09/28/11

(Revised 1/31/2008)

Effective Year: ~~2011~~ *2012*

DC # *0392 - 2011 - AE - 000 - 00*

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

Tabled

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:
Aerospace Engineering – *BS*

Department: Mechanical and Aerospace Engineering

Briefly describe action requested (Attach documentation as appropriate):
Remove the requirement of taking the Fundamentals of Engineering Examination prior to graduation. This requirement has been replaced by a departmental Exit Exam that all graduating seniors must take prior to their graduation. The purpose of this exam is to assess and evaluate the degree to which the undergraduate Aerospace Engineering Program outcomes are being achieved by students upon their graduation.

Need to know what

Need letter from the Provost

Received form on 5-6-2011

Recommended by Department: _____   Date: *3/8/2011*
                                              (Chair signature)

Recommended by: _____   Date: *7/18/11*
Discipline Specific Curricula Committee   (Chair signature)

Approved by Curricula Committee:_____   Date:_____
                                              (Chair signature)

Approved by Faculty Senate: _____   Date:_____
                                              (Chair signature)

03/01/11

(Revised 1/31/2008)

MISSOURI S&T

MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY

Formerly University of Missouri-Rolla

September 26, 2011

To: Dr. Robert Schwartz, Interim Provost

From: K. M. Isaac, Associate Chair of Aerospace Engineering

RE: Request for Approval to replace FE exam with Aerospace Engineering Exit Exam

The Campus Curriculum Committee has given conditional approval of our degree change request to remove the FE Assessment requirement for graduation and replace it with the Aerospace Engineering Exit Exam. We feel this exam will provide much more useful assessment information related to the AE curriculum, thus aiding in our continual improvement efforts. Note also that the FE Exam does not have AE discipline-specific questions, which tends to result in lower scores for the AE students who take the FE Exam. However, we will continue to strongly encourage our students to take the FE exam. This letter is to request your approval of this action as requested by the Campus Curriculum Committee. If you approve this request, please sign below and return this letter to me. We will then distribute copies as designated by the Campus Curriculum Committee.

By my signature, I approve this request.

Dr. James Drallmeier, Professor and Chair, Mechanical & Aerospace Engineering

Dr. Robert Schwartz, Interim Provost, Missouri University of Science & Technology