Minutes of the Campus Curricula Committee Meeting
April 5, 2016
12:30 p.m., Room 106B Parker Hall


Guests: Bonnie Bachman.

The following curriculum forms were discussed and approved:

Course Change Forms:
   File #4304  File #4076

   File #4138 was tabled pending further information.

Degree Change Forms:
   File #153.35  File #53.7
   File #68.2

Experimental Course Forms:
   File #4299  File #4303
   File #4306  File #4305
   File #4300  File #4301

   File #4297 was tabled.

The meeting adjourned at 1:35 p.m.

Ilene H. Morgan, Chair
Missouri S&T Campus Curricula Committee
Course Inventory Change Request

New Course Proposal

Date Submitted: 02/12/16 1:00 pm

Viewing: ELEC ENG 6335: Discrete-Time Neural Network Control

File: 4304
Last edit: 03/21/16 8:01 am
Changes proposed by: martins

Requested: Fall 2016
Effective Change Date: 

Department: Electrical and Computer Engineering
Discipline: Electrical Engineering (ELEC ENG)
Course Number: 6335
Title: Discrete-Time Neural Network Control
Abbreviated Course Title: Discrete Neural Control

Catalog Description:
Neural network topologies, universal function approximation property, background on Lyapunov stability & dynamic systems, control of a class of nonlinear systems using single and multilayer neural networks, feedback linearization, strict & nonstrict feedback systems, MIMO system, system identification, output feedback control, and hardware implementation.

Prerequisites:
Elec Eng 6300.

Field Trip Statement:

Credit Hours: LEC: 3  LAB: 0  IND: 0  RSD: 0  Total: 3

Required for Majors: No
Elective for Majors: Yes

In Workflow:
1. RELECENG Chair
2. CCC Secretary
3. Engineering DSCC Chair
4. Pending CCC Agenda post
5. CCC Meeting Agenda
6. Campus Curricula Committee Chair
7. FS Meeting Agenda
8. Faculty Senate Chair
9. Registrar
10. Ishelton
11. Peoplesoft

Approval Path:
1. 02/12/16 2:47 pm Daryl Beetner (daryl): Approved for RELECENG Chair
2. 02/12/16 2:51 pm Kaylon Buckner (kleb6b): Approved for CCC Secretary
3. 03/01/16 11:01 am sraper: Approved for Engineering DSCC Chair
4. 03/21/16 8:02 am Kaylon Buckner (kleb6b):
Justification for new course:

Course supports research program of controls faculty in ECE, Mech and Aero departments. The course also satisfies the 6xxx graduate course requirement.

Semesters previously offered as an experimental course:
FS 2013 and FS 2015

Co-Listed Courses:

Course Reviewer Comments

Key: 4304
Preview Bridge

https://nextcatalog.mst.edu/courseleaf/courseleaf.cgi?page=/courseadmin...
Course Inventory Change Request

New Course Proposal

Date Submitted: 02/01/16 1:15 pm

Viewing: GEO ENG 1880: Civic Engagement

File: 4076

Last edit: 04/05/16 4:38 pm

Changes proposed by: kleb6b

Programs referencing this course

HUM ENG-MI: Humanitarian Engineering and Science Minor

Requested Effective Change Date
Fall 2016

Department Geosciences and Geological and Petroleum Engineering

Discipline Geological Engineering (GEO ENG)

Course Number 1880

Title Civic Engagement

Abbreviated Course Title Civic Engagement

Catalog Description
Course provides a formal independent study framework so that Humanitarian Engineering & Science Minor students and other students have the opportunity to achieve formal recognition of experiential service learning that may occur during participation in extracurricular programs. Cannot be used for credit towards Geological Engineering B.S.

Prerequisites
Open to undergraduate students pursuing the Humanitarian Engineering and Science Minor.

Field Trip Statement
Students will work with S&T as well as corporate and community partners to formally identify extracurricular projects. Those projects may be executed near the...
S&T campus, the surrounding community, other areas in Missouri or the United States, or foreign countries. The participating students and/or the sponsoring partners will be responsible for the costs associated with the individual experiential service learning projects.

Credit Hours | LEC: 0 | LAB: 0 | IND: .5 | RSD: 0 | Total: .5
---|---|---|---|---|---
Required for Majors | No
Elective for Majors | No

Justification for new course:

This course is to be offered for S/U credit. This course cannot be used as credit towards a B.S., M.S., M.E. or Ph.D. in Geological Engineering. This is a required course for the Humanitarian Engineering and Science Minor. The civic engagement element of the HES Minor addresses Lever 1.1 of the Strategic Plan which requires all undergraduates to participate in some significant experiential learning activity before graduation. The development of a HES Minor is explicitly included in Prioritized Action 1.2.6 “(d)evelop minor and certificate programs in leadership, entrepreneurship, humanitarian engineering and science, and creativity”. Students participating in their civic engagement activities during any future intercession or spring break time periods would help address Prioritized Action 1.2.5.

*Updated prerequisite per Dr. Elmore 2/1/2016; already approved as a new course Fall 2014

Semesters previously offered as an experimental course

Co-Listed Courses:

Course Reviewer | Comments
---|---
kaleb (02/01/16 1:03 pm): Rollback: Per request
kaleb (02/01/16 1:13 pm): Rollback: rollback
imorgan (04/05/16 4:38 pm): This is not actually a new course but has to be submitted as a new course because of a glitch in CourseLeaf.
Program Change Request

Date Submitted: 01/21/16 11:21 am

Viewing: **CP ENG-BS : Computer Engineering BS**

File: 153.35

Last approved: 09/21/15 10:16 am

Last edit: 01/21/16 11:21 am

Changes proposed by: stanleyj

Catalog Pages

Using this Program

Start Term Fall 2016

Program Code CP ENG-BS

Department Electrical and Computer Engineering

Title Computer Engineering BS

Program Requirements and Description

**Bachelor of Science Computer Engineering**

Entering freshmen desiring to study Computer Engineering will be admitted to the Freshman Engineering Program. They will be permitted to state a Computer Engineering preference, which will be used as a consideration for available freshman departmental scholarships. The focus of the Freshman Engineering program is on enhanced advising and career counseling, with the goal of providing to the student the information necessary to make an informed decision regarding the choice of a major.

For the Bachelor of Science degree in Computer Engineering a minimum of 128 credit hours is required. These requirements are in addition to credit received for algebra, trigonometry, and basic ROTC courses. An average of at least two grade points per credit hour must be attained. At least two grade points per credit hour must also be attained in all courses taken in Computer Engineering.

Each student's program of study must contain a minimum of 21 credit hours of course work in general education and must be chosen according to the following rules:

1. All students are required to take one American history course, one economics course, one humanities course, and . The history course is to be selected from HISTORY 1200, HISTORY 1300, HISTORY 1310, or POL SCI 1200. The economics course may be either ECON 1100, ECON 1200, or ECON 1200. The humanities course must be selected from the approved lists for art, English, foreign languages, music, philosophy, speech and media studies, or theater.

2. Depth requirement. Three credit hours must be taken in humanities or social sciences at the 2000 level or above and must be selected from the approved list. This course must have as a prerequisite one of the humanities or social sciences courses already taken. Foreign language courses numbered 1180 will be considered to satisfy this requirement. Students may receive humanities credit for foreign language courses in their native tongue only if the course is at the 4000 level. All courses taken to satisfy the depth requirement must be taken after graduating from high school.

3. The remaining two courses are to be chosen from the list of approved humanities/social sciences courses and may include one communications course in addition to ENGLISH 1120.

4. Any specific departmental requirements in the general studies area must be satisfied.

5. Special topics and special problems and honors seminars are allowed only by petition to and approval by the student's department chairman.

The Computer Engineering program at Missouri S&T is characterized by its focus on the scientific basics of engineering and its innovative application; indeed, the underlying theme of this educational program is the application of the scientific basics to engineering practice through
attention to problems and needs of the public. The necessary interrelations among the various topics, the engineering disciplines, and the other professions as they naturally come together in the solution of real world problems are emphasized as research, analysis, synthesis, and design. These interrelations are presented and discussed through classroom and laboratory instruction.

**Free Electives Footnote:**

Each student is required to take three hours of free electives in consultation with his/her academic advisor. Credits which do not count towards this requirement are deficiency courses (such as algebra and trigonometry), and extra credits in required courses. Any courses outside of engineering and science must be at least three credit hours.

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Credits</th>
<th>Second Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Semester</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FR ENG 1100</td>
<td>1</td>
<td>MECH ENG 1720</td>
<td>3</td>
</tr>
<tr>
<td>MATH 1214</td>
<td>4</td>
<td>MATH 1215</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 1310</td>
<td>4</td>
<td>PHYSICS 1135</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 1319</td>
<td>1</td>
<td>ECON 1100 or 1200</td>
<td>3</td>
</tr>
<tr>
<td>HISTORY 1200, or 1300, or 1310, or POL SCI 1200</td>
<td>3</td>
<td>Elective-Hum or Soc (any level)</td>
<td>3</td>
</tr>
<tr>
<td>ENGLISH 1120</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td></td>
<td>17</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sophomore Year</th>
<th>Credits</th>
<th>Second Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Semester</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ELEC ENG 2100</td>
<td>3</td>
<td>COMP ENG 2210</td>
<td>3</td>
</tr>
<tr>
<td>ELEC ENG 2101</td>
<td>1</td>
<td>COMP ENG 2211</td>
<td>1</td>
</tr>
<tr>
<td>MATH 2222</td>
<td>4</td>
<td>ELEC ENG 2120</td>
<td>3</td>
</tr>
<tr>
<td>COMP SCI 1570</td>
<td>3</td>
<td>MATH 3304</td>
<td>3</td>
</tr>
<tr>
<td>COMP SCI 1580</td>
<td>1</td>
<td>COMP SCI 1510</td>
<td>3</td>
</tr>
<tr>
<td>PHYSICS 2135</td>
<td>4</td>
<td>COMP SCI 1200</td>
<td>3</td>
</tr>
<tr>
<td>16</td>
<td></td>
<td>16</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Junior Year</th>
<th>Credits</th>
<th>Second Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Semester</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMP ENG 3110</td>
<td>3</td>
<td>COMP ENG Elective A</td>
<td>3,14</td>
</tr>
<tr>
<td>COMP ENG 3150</td>
<td>3</td>
<td>ELEC ENG 3410</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 3551</td>
<td>1</td>
<td>COMP SCI 3800</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 3151</td>
<td>1</td>
<td>STAT 3117</td>
<td>3</td>
</tr>
<tr>
<td>ELEC ENG 2200</td>
<td>3</td>
<td>Communication Elective</td>
<td>13</td>
</tr>
<tr>
<td>ELEC ENG 2201</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mathematics Elective 10</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SP&amp;M S 1185</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td></td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Senior Year</th>
<th>Credits</th>
<th>Second Semester</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Semester</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMP ENG 5410</td>
<td>3</td>
<td>COMP ENG Elective D</td>
<td>3,15,16</td>
</tr>
<tr>
<td>COMP ENG Elective C</td>
<td>3</td>
<td>COMP ENG Elective E</td>
<td>3,15,16</td>
</tr>
<tr>
<td>COMP ENG 4096</td>
<td>1</td>
<td>COMP ENG 4097</td>
<td>3</td>
</tr>
<tr>
<td>Elective-Hum or Soc (any level)</td>
<td>3</td>
<td>Elective-Hum or Soc (upper level)</td>
<td>3</td>
</tr>
<tr>
<td>Engineering Science Elective 11</td>
<td>3</td>
<td>Free Elective</td>
<td>18</td>
</tr>
<tr>
<td>COMP ENG Elective B</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td></td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>
**Notes:** Student must satisfy the common engineering freshman year requirements and be admitted into the department.

| 1 | The minimum number of hours required for a degree in Computer Engineering is 128. |
| 2 | Students that transfer to Missouri S&T after their freshman year are not required to enroll in Freshman Engineering Seminars. |
| 3 | A minimum grade of "C" must be attained in MATH 1214, MATH 1215, MATH 2222, and MATH 3304, PHYSICS 1135 and PHYSICS 2135 (or their equivalents), COMP SCI 1570, COMP SCI 1590, COMP SCI 1510, COMP SCI 1200, COMP SCI 3800, COMP ENG 2210, COMP ENG 2211, COMP ENG 3150, COMP ENG 3551, COMP ENG 3110, COMP ENG 5410 or COMP SCI 5600, COMP ENG 4096, and ELEC ENG 2100, ELEC ENG 2101, ELEC ENG 2120, ELEC ENG 2200, ELEC ENG 2201, ELEC SCI 3410, and ELEC ENG 3411, and the COMP ENG electives A, B, C, D and E. Also, students may not enroll in other courses that use these courses as prerequisites until the minimum grade of "C" is attained. |
| 4 | Students may take PHYSICS 1111 and PHYSICS 1119 in place of PHYSICS 1135. Students may take PHYSICS 2111 and PHYSICS 2119 in place of PHYSICS 2135. |
| 5 | All electives must be approved by the student's advisor. Students must comply with the general education requirements with respect to selection and depth of study. These requirements are specified in the current catalog. |
| 6 | Students who drop a lecture course prior to the deadline to drop a class must also drop the corequisite lab course. |
| 7 | Students must earn a passing grade on the ELEC ENG Advancement Exam I (associated with ELEC ENG 2100) before they enroll in ELEC ENG 2120 or ELEC ENG 2200 and ELEC ENG 2201. |
| 8 | Students must earn a passing grade on the COMP ENG Advancement Exam (associated with COMP ENG 2210) before they enroll in any course with COMP ENG 2210 and COMP ENG 2211 as prerequisites. |
| 9 | Students must earn a passing grade on the ELEC ENG Advancement Exam II (associated with ELEC ENG 42120) before they enroll in ELEC ENG 3410 and ELEC ENG 3411. |
| 10 | Students must take one of the following courses: MATH 3103, MATH 3108, MATH 3109, MATH 5302, MATH 5603, MATH 5105, MATH 5106, MATH 5107, MATH 5108, MATH 4209, MATH 4211, MATH 5215, MATH 5222, MATH 5325, MATH 4530, MATH 5737, MATH 5351, MATH 5154, MATH 4096, MATH 5483, MATH 5583, STAT 5644, STAT 5346, STAT 5353. |
| 11 | Students must take MECH ENG 2340, MECH ENG 2519, MECH ENG 2527, PHYSICS 2311, PHYSICS 2410, CHEM 2210, BIO SCI 2213, or BIO SCI 2223. The following pairs of course are substitutions for any single course: CIV ENG 2200 and MECH ENG 2350, PHYSICS 2305 and PHYSICS 4311, PHYSICS 2305 and CER ENG 4240, or PHYSICS 2305 and NUC ENG 3205. |
| 12 | Students may replace STAT 3117 with STAT 3115 or STAT 5643. |
| 13 | Students must take English 3560 or English 1160. Students may replace SpMS 1185 with the ROTC sequence of Mil Army 4250 and 4500 or Mil Air 4110 and 4120. |
| 14 | Comp Eng Elective A must be a 4000 or 5000-level Comp Eng, Elec Eng, or Comp Sci course with at least a 3-hour lecture component. This normally includes all Comp Eng and Elec Eng 4000 and 5000-level courses except Comp Eng or Elec Eng 4000, 4099, 4096, and 4907 or Comp Sci 5000, 4010, 5600, and 4909. |
| 15 | Comp Eng Electives C, D, and E must be 3000, 4000 or 5000-level courses from an approved list of science, mathematics, and engineering courses. In particular, this list includes all 3000, 4000 or 5000-level Comp Eng, Elec Eng and Comp Sci courses except required courses in Comp Eng, Elec Eng, and Comp Sci and except Comp Eng 4096 and 4097, Elec Eng 2800, 1002, 1003, 4096, and 4097, and Comp Sci 2002 and 4600(5600). Comp Eng Electives C, D, and E must include at least six hours of engineering or computer science courses. |
| 16 | COMP ENG Electives C, D, and E cannot include more than three hours of COMP ENG 4000, COMP ENG 4099, ELEC ENG 4000, or ELEC ENG 4099. |
| 17 | Students pursuing dual degrees in COMP ENG and ELEC ENG may take either COMP ENG 4096 or ELEC ENG 4096 and COMP ENG 4097 or ELEC ENG 4097. Students may not receive credit for both COMP ENG 4096 and ELEC ENG 4096 or COMP ENG 4097 and ELEC ENG 4097 in the same degree program. |
| 18 | Students are required to take at least three credit hours. Elec Eng 2800 level, ELEC ENG 4096, ELEC ENG 4097, COMP ENG 4096 and COMP ENG 4097 may not be used for free electives. No more than one credit hour of COMP ENG 3002 or ELEC ENG 3002 may be applied to the BS degree for free electives. |
| 19 | Comp Eng Elective B must be a 4000 or 5000 level COMP ENG course with at least a 3-hour lecture component, excluding COMP ENG 4096 and COMP ENG 4097. |

**Emphasis Areas for Computer Engineering**

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

**Computational Intelligence**
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP ENG 5310</td>
<td>Computational Intelligence</td>
<td>3</td>
</tr>
<tr>
<td>ELEC ENG 5370</td>
<td>Introduction To Neural Networks &amp; Applications</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 6310</td>
<td>Markov Decision Processes</td>
<td>3</td>
</tr>
<tr>
<td>ELEC ENG 5330</td>
<td>Fuzzy Logic Control</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 5450</td>
<td>Digital Image Processing</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 5460</td>
<td>Machine Vision</td>
<td>3</td>
</tr>
</tbody>
</table>

**Computer, Computers and Architecture and Embedded Computer Systems**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP ENG 5170</td>
<td>Real-Time Systems</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 5151</td>
<td>Digital Systems Design Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 5160</td>
<td>Embedded Processor System Design</td>
<td>3</td>
</tr>
<tr>
<td>ELEC ENG 3320</td>
<td>Control Systems</td>
<td>3</td>
</tr>
<tr>
<td>ELEC ENG 3100</td>
<td>Electronics I</td>
<td>3</td>
</tr>
<tr>
<td>COMP SCI 3400</td>
<td>Software Engineering I</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP ENG 5110</td>
<td>Principles of Computer Architecture</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 5120</td>
<td>Digital Computer Design</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 5151</td>
<td>Digital Systems Design Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 5160</td>
<td>Embedded Processor System Design</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 5170</td>
<td>Real-Time Systems</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 5510</td>
<td>Fault-Tolerant Digital Systems</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP ENG 5610</td>
<td>Real-Time Digital Signal Processing</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 5510</td>
<td>Advanced Microcomputer System Design</td>
<td>3</td>
</tr>
<tr>
<td>ELEC ENG 3320</td>
<td>Control Systems</td>
<td>3</td>
</tr>
<tr>
<td>ELEC ENG 3100</td>
<td>Electronics I</td>
<td>3</td>
</tr>
<tr>
<td>COMP SCI 3100</td>
<td>Software Engineering I</td>
<td>3</td>
</tr>
</tbody>
</table>

**Integrated Circuits and Logic Design**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP ENG 2210</td>
<td>Introduction to Digital Logic</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 5210</td>
<td>Introduction To VLSI Design</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 5220</td>
<td>Digital System Modeling</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 6210</td>
<td>Digital Logic</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELEC ENG 3100</td>
<td>Electronics I</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 5110</td>
<td>Principles of Computer Architecture</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 5151</td>
<td>Digital Systems Design Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 5120</td>
<td>Digital Computer Design</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 5130</td>
<td>Advanced Microcomputer System Design</td>
<td>3</td>
</tr>
</tbody>
</table>
Justification for request

There have been numerous faculty leave the Computer Engineering department at Missouri S&T since the current Emphasis Areas were adopted over 10 years ago. New faculty hires over this time period have had backgrounds and research interests in different areas not necessarily matching up with the current Emphasis Areas. The Computer Engineering faculty adopted new Emphasis area changes for the Computer Engineering, BS program in order to make the Emphasis Areas more reflective of current Computer Engineering faculty backgrounds and research areas. In addition to adopting new Emphasis Areas, the Highly Recommended and Suggested courses for each Emphasis Area have been updated based on currently offered courses and Computer Engineering faculty recommendations for those Emphasis Areas. As noted with the Emphasis Area description, students pursuing a Computer Engineering BS degree can optionally declare an Emphasis Area to guide their choices for Computer Engineering elective courses. Declaring an Emphasis Area is not a requirement for completion of a Computer Engineering BS degree program, and an Emphasis Area declaration is not shown on the student’s transcription. Emphasis Areas for Computer Engineering BS degree program provide students with technical paths, background, and skills options that students may pursue in the Elective Areas of their degree programs. The Emphasis Area changes for the Computer Engineering, BS program were approved by the Computer Engineering faculty on October 28, 2015, as recorded in the Computer Engineering faculty meeting minutes. The ECE Academy was consulted and approved the need to update the Emphasis Areas.

The following documents are included with this DC form to support the MDHE Program Change request to be submitted to he.academicprogramactions@dhe.mo.gov:

### Networking, Security, Networking and Dependability Software Engineering Security and Reliability

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP ENG 5510</td>
<td>Fault-Tolerant Digital Systems</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 5420</td>
<td>Introduction to Network Security</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 5310</td>
<td>Computational Intelligence</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 5450</td>
<td>Digital Image Processing</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 5460</td>
<td>Machine Vision</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 5420</td>
<td>Introduction to Network Security</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 5430</td>
<td>Wireless Networks</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 6440</td>
<td>Network Performance Analysis</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 6510</td>
<td>Resilient Networks</td>
<td>3</td>
</tr>
</tbody>
</table>

Highly Recommended

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP ENG 5110</td>
<td>Principles of Computer Architecture</td>
<td>3</td>
</tr>
<tr>
<td>COMP SCI 3100</td>
<td>Software Engineering I</td>
<td>3</td>
</tr>
<tr>
<td>IS&amp;T 4641</td>
<td>Electronic and Mobile Commerce</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 5510</td>
<td>Fault-Tolerant Digital Systems</td>
<td>3</td>
</tr>
</tbody>
</table>

Suggested

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP ENG 5310</td>
<td>Computational Intelligence</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 5450</td>
<td>Digital Image Processing</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 5460</td>
<td>Machine Vision</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 5430</td>
<td>Wireless Networks</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 6440</td>
<td>Network Performance Analysis</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 6510</td>
<td>Resilient Networks</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP ENG 5110</td>
<td>Principles of Computer Architecture</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 5430</td>
<td>Wireless Networks</td>
<td>3</td>
</tr>
<tr>
<td>COMP ENG 6440</td>
<td>Network Performance Analysis</td>
<td>3</td>
</tr>
</tbody>
</table>
1) "FormPC-CpE BS Degree Program Emphasis Area Changes - Oct 2015.docx" contains the MDHE Program Change form
2) "FormPC-BeforeAfter and Rationale for Emphasis Area Changes.docx" contains the before and after curriculum (Emphasis Areas with Highly Recommended and Suggest courses) with rationale for the change request. The rationale for the change request has been copied above.

-------------------
CpE 3551 should be numbered as CpE 3151 (which is the correct course number).
-------------------

Change the speech requirement
“SpMS 1185-Speech 3 hrs” with no footnote to
“SpMS 1185-Speech 3 hrs” with footnote 13
“13) Students may replace English 3560 with English 1160. Students may replace SpMS 1185 with the ROTC sequence of Mil Army 4250 and 4500 or Mil Air 4110 and 4120”

Justification
The speech ROTC change will allow a 6-credit hour course sequence in Army and Air Force ROTC at the senior level to replace the 3-credit-hour, lower-level speech requirement and would not change our writing requirement. The proposal is strongly supported by the commanders of the S&T Army ROTC and Air Force ROTC Departments and was approved by the ECE faculty.

Supporting Documents

Course Reviewer: kleb6b (01/20/16 2:21 pm): Rollback: Rollback Request
Comments: daryl (01/21/16 9:11 am): Rollback: please change "Computers" to "Computer" in the emphasis area (see email)
Program Change Request

Date Submitted: 02/16/16 3:08 pm

Viewing: **ETHICS-MI : Ethics Minor**

File: 53.7

Last approved: 04/28/14 10:49 am

Last edit: 02/17/16 10:29 am

Changes proposed by: denises

<table>
<thead>
<tr>
<th>Catalog Pages</th>
<th>Philosophy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using this Program</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Start Term</th>
<th>Fall 2016 8/1/2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program Code</td>
<td>ETHICS-MI</td>
</tr>
<tr>
<td>Department</td>
<td>Arts, Languages, &amp; Philosophy</td>
</tr>
<tr>
<td>Title</td>
<td>Ethics Minor</td>
</tr>
</tbody>
</table>

Program Requirements and Description

**Ethics Minor**

To qualify, all students must take 15 hours of course work from the following list of which at least 6 hours are from the 4000-level:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHILOS 1105</td>
<td>Introduction To Philosophy</td>
<td>3</td>
</tr>
<tr>
<td>PHILOS 1115</td>
<td>Introduction To Logic</td>
<td>3</td>
</tr>
<tr>
<td>PHILOS 1130</td>
<td>Introduction to Ethics</td>
<td>3</td>
</tr>
</tbody>
</table>

Approval Path

1. 02/17/16 9:53 am audram: Approved for RPHILOSO Chair
2. 02/17/16 10:30 am Kaylon Buckner (kleb6b): Approved for CCC Secretary
3. 02/17/16 10:47 am dewittp: Approved for Arts & Humanities DSCC Chair
4. 03/21/16 8:05 am Kaylon Buckner (kleb6b): Approved for Pending CCC Agenda post
5. 04/05/16 1:47 pm Kaylon Buckner (kleb6b): Approved for CCC Meeting Agenda
6. 04/05/16 4:37 pm imorgan: Approved for Campus Curricula Committee Chair

History

1. Apr 28, 2014 by ivliyeva
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHILOS 1175</td>
<td>Comparative Religious Philosophy</td>
<td>3</td>
</tr>
<tr>
<td>PHILOS 3223</td>
<td>Bioethics</td>
<td>3</td>
</tr>
<tr>
<td>PHILOS 3225</td>
<td>Engineering Ethics</td>
<td>3</td>
</tr>
<tr>
<td>PHILOS 3235</td>
<td>Business Ethics</td>
<td>3</td>
</tr>
<tr>
<td>PHILOS 4335</td>
<td>Philosophy Of Religion</td>
<td>3</td>
</tr>
<tr>
<td>PHILOS 4340</td>
<td>Social Ethics</td>
<td>3</td>
</tr>
<tr>
<td>PHILOS 4350</td>
<td>Environmental Ethics</td>
<td>3</td>
</tr>
<tr>
<td>PHILOS 4360</td>
<td>Foundations Of Political Conflict</td>
<td>3</td>
</tr>
<tr>
<td>PHILOS 4368</td>
<td>Law and Ethics in E-Commerce</td>
<td>3</td>
</tr>
</tbody>
</table>

Justification for request: To expand the Philosophy curriculum offerings for the minor

Supporting Documents

Course Reviewer Comments: **kleb6b (02/17/16 10:29 am):** Put new course in correct order
Program Change Request

Date Submitted: 02/01/16 11:46 am

Viewing: GEOT-ME : Geotechnics ME

File: 68.2

Last approved: 07/23/15 10:54 am

Last edit: 02/01/16 1:02 pm

Changes proposed by: norbert

Catalog Pages Using this Program

Start Term Fall 2016 2015

Program Code GEOT-ME

Department Geosciences and Geological and Petroleum Engineering

Title Geotechnics ME

Program Requirements and Description

Course Requirements

The M.E. degree program will require 30 semester hours of graduate credit in 4000, 5000, 6000 level courses. The following four core courses (12 hours) are required:

The approved program link is: https://nextcatalog.mst.edu/courseleaf/courseleaf.cgi?page=/programadm...
An additional 18 hours of coursework are required, including a 3-hour industrial (practice oriented) project. 

### Justification for request

Request that the GE 6000 (Special Problems) course be replaced by GE 6400 (Practice Oriented Program) for the Industrial (practice oriented) project requirement of the Geotechnics ME. The GE 6400 class was specifically created for the Geotechnics ME. It replaces the GE 6000 (Special Topics) class. There was in the past confusion as to whether a GE 6000 class was a practice oriented project, or just a special study class. In addition, Grad Faculty rules allow only a single GE 6000 class for a master's degree.

### Supporting Documents

**Course Reviewer Comments**

- **ikueneb (02/01/16 9:30 am):** Rollback: Correction needed in courses requirements:
  - replace 300 and 400 level courses with 5000 and 6000 in the description.

- **kleb6b (02/01/16 1:02 pm):** Effective term
Course Inventory Change Request

New Experimental Course Proposal

Date Submitted: 02/01/16 5:10 pm

Viewing: AERO ENG 6001.001: Control of Networked Multiagent Systems

File: 4299
Last edit: 02/02/16 8:40 am
Changes proposed by: nisbett

Requested: Fall 2016
Effective Change Date: 02/02/16

Department: Mechanical & Aerospace Engineering
Discipline: Aerospace Engineering (AERO ENG)
Course Number: 6001
Topic ID: 001
Experimental Title: Control of Networked Multiagent Systems
Experimental Abbreviated Course Title: Control Multiagent Sys
Instructors: Tansel Yucelen

Experimental Catalog Description:
An introduction to the basics of networked multiagent systems control. Throughout the course both synthesis and analysis of control laws for networked multiagent systems (particularly including large-scale modular systems and multivehicle systems) will be presented based on stability, robustness, and optimality considerations.

Prerequisites:
Mech Eng 5481 or Aero Eng 5481.

Field Trip Statement

In Workflow
1. RMECHENG Chair
2. CCC Secretary
3. Engineering DSCC Chair
4. Pending CCC Agenda post
5. CCC Meeting Agenda
6. Campus Curricula Committee Chair
7. Registrar

Approval Path
1. 02/02/16 8:34 am
   drallmei: Approved for RMECHENG Chair
2. 02/02/16 8:40 am
   Kaylon Buckner (kleb6b): Approved for CCC Secretary
3. 02/19/16 12:23 pm
   sraper: Approved for Engineering DSCC Chair
4. 03/21/16 8:07 am
   Kaylon Buckner (kleb6b): Approved for Pending CCC Agenda post
5. 04/05/16 1:47 pm
   Kaylon Buckner (kleb6b): Approved for CCC
<table>
<thead>
<tr>
<th>Credit Hours</th>
<th>LEC: 3</th>
<th>LAB: 0</th>
<th>IND: 0</th>
<th>RSD: 0</th>
<th>Total: 3</th>
</tr>
</thead>
</table>

**Justification for new course:**
This is an important area of current research in the controls field.

**Semester(s) previously taught:**
None

**Co-Listed Courses:**
MECH ENG 6001 - Special Topics

AERO ENG 6001.001: Control of Networked Multiagent Systems
https://nextcatalog.mst.edu/courseleaf/courseleaf.cgi?page=/courseadmin...
Course Inventory Change Request

**New Experimental Course Proposal**

Date Submitted: 02/12/16 9:56 am

Viewing: **BIO SCI 2001.001 : Mammal Ecology**

File: 4303

Last edit: 03/15/16 10:16 am

Changes proposed by: niyogid

<table>
<thead>
<tr>
<th>Requested Effective Change Date</th>
<th>Summer 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department</td>
<td>Biological Sciences</td>
</tr>
<tr>
<td>Discipline</td>
<td>Biological Sciences (BIO SCI)</td>
</tr>
<tr>
<td>Course Number</td>
<td>2001</td>
</tr>
<tr>
<td>Topic ID</td>
<td>001</td>
</tr>
<tr>
<td>Experimental Title</td>
<td>Mammal Ecology</td>
</tr>
<tr>
<td>Experimental Abbreviated Course Title</td>
<td>Mammal Ecology</td>
</tr>
<tr>
<td>Instructors</td>
<td>staff</td>
</tr>
</tbody>
</table>

Experimental Catalog Description

This course will build from basic knowledge of human biology and explore the ecology and adaptations of the major mammalian orders. A survey of local mammals and explorations of the field techniques used to study mammal ecology will be integrated. Field trips will be conducted at a new field station. There is no cost for these trips.

Prerequisites


Field Trip Statement

Field trips to S&T's field station in Phelps County will be required. There is no cost for these trips. Given the timing of course offering (one week intensive class at end of May), there will be no conflict between this class and its field trips and other S&T
### Justification for new course:
This new class will fill a need for students interested in wildlife ecology, management, and conservation.

### Semester(s) previously taught
none

### Co-Listed
Courses:

### Course Reviewer
**imorgan (03/15/16 10:16 am):** Corrected minor typos.
Course Inventory Change Request

New Experimental Course Proposal

Date Submitted: 02/24/16 10:55 am

Viewing: **CHEM 4001.001 : Principles of Neurochemistry**

File: 4306

Last edit: 03/15/16 10:18 am

Changes proposed by: nercal

Requested: Fall 2016

Effective Change Date:

Department: Chemistry

Discipline: Chemistry (CHEM)

Course Number: 4001

Topic ID: 001

Experimental Title: Principles of Neurochemistry

Experimental Abbreviated Course Title: Neurochem

Instructors: Nuran Ercal and Daniel Hier

Experimental Catalog Description:

Neurochemistry is a senior undergraduate-level course that explores the biochemistry of the nervous system. Clinical correlations are emphasized. The course will be of interest to chemistry, biology, psychology, and pre-medical students.

Prerequisites:

Chem 4610.

Field Trip Statement

Credit Hours: LEC: 3  LAB: 0  IND: 0  RSD: 0  Total: 3

Justification for new course:
This course was already offered as a 6000-level course; however, we believe that it is more suited for the upper-level undergraduate students.

Semester(s) previously taught
FS2014 as Chem 6001

Co-Listed Courses:

Course Reviewer Comments
imorgan (03/15/16 10:18 am): Added prerequisite with approval of department based on DSCC discussion.
Course Inventory Change Request

New Experimental Course Proposal

Date Submitted: 02/17/16 11:31 am

Viewing: MECH ENG 5001.001 : Introduction to Microfluidics

File: 4305

Last edit: 02/17/16 11:48 am

Changes proposed by: nisbett

Requested
Effective Change Date
Summer 2016

Department
Mechanical & Aerospace Engineering

Discipline
Mechanical Engineering (MECH ENG)

Course Number
5001

Topic ID
001

Experimental Title
Introduction to Microfluidics

Experimental Abbreviated Course Title
Intro to Microfluidics

Instructors
Dr. Cheng Wang, Dr. K.M. Isaac

Experimental Catalog Description
Topics include overview of microfluidics, basic principles and scaling laws, microfabrication techniques, experimental measurements, electrohydrodynamics, magnetofluidics, acoustofluidics, and applications in engineering and sciences. Emphasis will be on the fundamental understanding of transport phenomena at the microscale.

Prerequisites
Math 2222, Phys 2135 or equivalent, and one from the following list: Mech Eng 3131, Aero Eng 3131, Chem Eng 3100, Chem 3410, Elec Eng 3600, Civ Eng 3330, Cer Eng 3410.

Field Trip Statement

In Workflow
1. RMECHENG Chair
2. CCC Secretary
3. Engineering DSCC Chair
4. Pending CCC Agenda post
5. CCC Meeting Agenda
6. Campus Curricula Committee Chair
7. Registrar

Approval Path
1. 02/17/16 11:41 am
   drallmei:
   Approved for RMECHENG Chair
2. 02/17/16 11:48 am
   Kaylon Buckner (kleb6b):
   Approved for CCC Secretary
3. 03/01/16 11:01 am
   sraper: Approved for Engineering DSCC Chair
4. 03/21/16 8:10 am
   Kaylon Buckner (kleb6b):
   Approved for Pending CCC Agenda post
5. 04/05/16 1:47 pm
   Kaylon Buckner
<table>
<thead>
<tr>
<th>Credit Hours</th>
<th>LEC: 3</th>
<th>LAB: 0</th>
<th>IND: 0</th>
<th>RSD: 0</th>
<th>Total: 3</th>
</tr>
</thead>
</table>

Justification for new course:
This course covers an important area of current and developing research.

Semester(s) previously taught
Spring 2012

Co-Listed Courses:
AERO ENG 5001 - Special Topics

Course Reviewer Comments

(kleb6b):
Approved for CCC Meeting Agenda
6. 04/05/16 4:39 pm
imorgan:
Approved for Campus Curricula Committee Chair
 Course Inventory Change Request

New Experimental Course Proposal

Date Submitted: 02/08/16 5:02 pm

Viewing: MET ENG 5001.001 : Hydrometallurgy I

File: 4300

Last edit: 02/19/16 12:23 pm

Changes proposed by: moatsm

Requested Fall 2016

Effective Change Date

Department Materials Science & Engineering

Discipline Metallurgical Engineering (MET ENG)

Course Number 5001

Topic ID 001

Experimental Title Hydrometallurgy I

Experimental Abbreviated Course Title Hydomet I

Instructors Michael Moats

Experimental Catalog Description

This course will examine the fundamentals and practice of leaching and solution purification. A review of relevant thermodynamics and kinetics will be included. Descriptions of commercial unit operations will be presented.

Prerequisites

A grade of "C" or better in either Cer Eng 3230 or Met Eng 3220.

Field Trip Statement

Credit Hours

LEC: 3   LAB: 0   IND: 0   RSD: 0   Total: 3

Justification for new course:

In Workflow

1. RMATSENG Chair
2. CCC Secretary
3. Engineering DSCC Chair
4. Pending CCC Agenda post
5. CCC Meeting Agenda
6. Campus Curricula Committee Chair
7. Registrar

Approval Path

1. 02/08/16 5:25 pm
   Richard Brow (brow): Approved for RMATSENG Chair

2. 02/09/16 8:02 am
   Kaylon Buckner (kleb6b): Approved for CCC Secretary

3. 02/19/16 12:23 pm
   sraper: Approved for Engineering DSCC Chair

4. 03/21/16 8:11 am
   Kaylon Buckner (kleb6b): Approved for Pending CCC Agenda post

5. 04/05/16 1:47 pm
   Kaylon Buckner (kleb6b):
The course is being offered to expand the number of courses offered to MSE and Min Eng students in extractive metallurgy. This is in response to comments made during graduating senior exit interviews. The course is also being added to allow Prof. Moats to provide greater in-depth instruction to graduate researchers in this area.

Semester(s) previously taught
This course was taught as MET ENG 4001 in Fall 2014. The level of the material presented warrants a re-classification as a 5000 level course.

Co-Listed Courses:

Course Reviewer  **sraper (02/19/16 12:23 pm)**: Modified description via email approval.

Comments
**Course Inventory Change Request**

### New Experimental Course Proposal

**Date Submitted:** 02/11/16 9:57 am  

**Viewing:** MIN ENG 6001.002 : Mining Property Disclosure  

**File:** 4301  

**Last edit:** 02/11/16 10:15 am  

**Changes proposed by:** kabp3

<table>
<thead>
<tr>
<th>Requested Effective Change Date</th>
<th>Fall 2016</th>
</tr>
</thead>
</table>

**Department:** Mining & Nuclear Engineering  

**Discipline:** Mining Engineering (MIN ENG)  

**Course Number:** 6001  

**Topic ID:** 002  

**Experimental Title:** Mining Property Disclosure  

**Experimental Abbreviated Course Title:** Min Prop Disclosure  

**Instructors:** Kwame Awuah-Offei

### Experimental Catalog Description

Definitions and requirements for public disclosure by public companies engaged in mining operations. Discussions on US and international regulatory environment for public disclosure on mining properties: Exploration results, mineral resources and mineral reserves. Principles for producing compliant and effective disclosure on mining properties.

### Prerequisites

**Field Trip Statement**

**Credit Hours**  

| LEC: 3 | LAB: 0 | IND: 0 | RSD: 0 | Total: 3 |

**Approval Path**

1. 02/11/16 10:06 am  
   reflori: Approved for RMINNUCL Chair  
2. 02/11/16 10:15 am  
   Kaylon Buckner (kleb6b): Approved for CCC Secretary  
3. 02/19/16 12:25 pm  
   sraper: Approved for Engineering DSCC Chair  
4. 03/21/16 8:11 am  
   Kaylon Buckner (kleb6b): Approved for Pending CCC Agenda post  
5. 04/05/16 1:47 pm  
   Kaylon Buckner
Justification for new course:

Nothing like this is offered in the catalog. But such a course will provide advanced preparation for our students to become mining professionals (engineers, scientists, legal and finance professionals in mining) who are able to meet professional and legal standards regarding public reporting on a mining company's most important assets.

Semester(s) previously taught: None

Co-Listed Courses:

Course Reviewer: reflori (02/11/16 9:48 am): Rollback: At Dr. Kwame's request.

Comments: