Minnesota State University, Mankato
Curriculum Proposal

Please type or select the requested information. Print completed forms, add appropriate paper attachments, and route through MSU's curricular process for recommendations and decisions.

(Check all that apply):
College: Science, Engineering and Technology
Department: Electrical and Computer Engineering and Technology
Program: Electronic Engineering Technology/Computer Science
Type of Change: N/A
Proposal: N/A
Title Current: N/A
Title Proposed: N/A
24-Char. Abbrev: N/A

Proposal #: 18
Effective Date of Change: N/A
Academic Year: 05
(For Office Use Only)
Course Designator and Number: N/A
Number of Credits: N/A

(fif applicable)

Include a course or program description for the Bulletin (30-40 words maximum for courses, 100 for programs):

Petition to evaluate transfer credits must occur no later than the first semester the student is enrolled at Minnesota State University, Mankato, in or declared a major based in the department of Electrical and Computer Engineering Technology.

Rationale or Justification for change:
Students are electing not to complete this until it is needed for graduation -- this makes advising ineffective.

***For General Education or Cultural Diversity Courses Only***

General Education Course:

<table>
<thead>
<tr>
<th>GE Category #</th>
<th>GE Category Name (Maximum of 3 Categories)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

For Writing Intensive Courses, attach a description of the kind and quantity of writing.

For Upper Division Courses, include a description of the respects in which it is broad and general rather than narrow and specific, and so suitable as GE.

Attach paper copies of the following:
  a. Syllabus or course outline.
  b. Course's student learning outcomes associated with each GE competency or CD designation.
  c. List of strategies to be used to assess students' achievement of each GE competency or CD designation.

Cultural Diversity Course:

(Please check one.)
  □ Core (At least 75% devoted to topics of race, gender, sexual orientation, age, class, and disabilities as they occur in United States Society.)
  □ Related (At least 25% devoted to the above topics or to a global perspective on topics related to African American, Asian, Hispanic, and Native American inhabitants of the United States.)

***For New Courses***

(Check all that apply):
  □ Course is an elective.
  □ Course is required for program
  □ Pre- or Co-requisites: N/A
  □ New instructional type: Lecture
  □ Grading Format: □ Grade □ P/N

Course will be offered:
  □ Fall Semester
  □ Spring Semester
  □ Summer Session

Other courses are being changed or eliminated. (Explain.)

Course content or title is similar to courses in other departments. (Attach copy of letter of agreement with other program(s) contacted. Indicate the nature of the discussions and/or resolution of differences or potential conflicts.)

Attach paper copies of the following:
  a. Syllabus or course outline.
  b. Course's student learning outcomes.
  c. A list of resources required to offer and support this course.
  d. A description of how teaching this course will affect department staffing.
  e. If 400/500 level course, an explanation of added expectations of graduate students.

Revised September 2002
###***For Program Proposals***

Attach paper copies of the following:

a. Student learning outcomes for the program.

b. Minutes from department and college curriculum meetings in which action was taken on this proposal.

c. Program Assessment Plan. Forms are available on the Academic Affairs Web site:
   [http://www.mnsu.edu/acadaff/words/PRA_SampSLQAssessPlan.doc](http://www.mnsu.edu/acadaff/words/PRA_SampSLQAssessPlan.doc)

d. List of program requirements for New programs, or a list of Current and Proposed program requirements for Redesigned programs.

e. A list of resources required to offer and support this program.

f. A description of how offering this program will affect department staffing.

g. A list of additional library holdings required for this program.

Please include rationale for any proposed changes in number of program credits:

###***For Programs Requiring MnSCU Approval***

If any of the following changes are proposed, please fill out and attach MnSCU Program Approval Forms, which are available on the Academic Affairs Web site:


1. Creation of an entirely new program.

2. Redesign of existing programs, which takes any of the following forms:
   - Addition or deletion of a program option. Options are part of program design in which 30-50% of the courses are required as part of a common core for all students, and which offers curriculum alternatives greater than 30% of the total number of credits in the major. Options are appropriate to baccalaureate or masters programs.
   - Addition or deletion of a program emphasis. Emphases are part of program design in which more than 50% of the courses are required as part of a common core for all students, and which offers curriculum alternatives with a minimum of nine credits. Emphases are appropriate to associate and baccalaureate programs.
   - Change in program name.
   - Change in program CIP #.
   - Change in TOTAL program credits.
   - Change in degree award. For example, changing a B.A. to B.S.
   - Creation of a new degree award in a related academic area. Examples include creation of a certificate program from an existing degree program, or a new degree program from an existing degree program (e.g., Art History BA from Art BA.)

3. Relocation of an existing program. This is a proposal to move an existing program from one site to be exclusively offered at another site, and requires closing the program offered at the original site. For example, a program offered both on-campus and through extended campus is to be offered only at the extended campus site.

4. Replication of an existing program. This is a proposal to offer an existing program at a new site, which may be an existing MnSCU-approved site, or another campus of the same institution. Replicated programs are offered at both the original site and the new location.

5. Suspension or reinstatement of a program. This proposal suspends admission of students into an existing program, and is good for three years. Reinstatement proposals request the reopening of student admissions into a given program.

6. Closure of a program. This proposal requests closure of an existing program and its from an institution’s official inventory of academic programs. Unless a department seeks to re-open a suspended program, it should be closed within three years of suspension.
<table>
<thead>
<tr>
<th><strong>Department</strong></th>
<th>Approved</th>
<th>(Category/ies)</th>
<th>Recommended</th>
<th>(Category/ies)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not Approved</td>
<td>(Category/ies)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comments:**

<table>
<thead>
<tr>
<th><strong>College Curriculum Committee</strong></th>
<th>Approved</th>
<th>(Category/ies)</th>
<th>Recommended</th>
<th>(Category/ies)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not Approved</td>
<td>(Category/ies)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comments:**

<table>
<thead>
<tr>
<th><strong>College Dean</strong></th>
<th>Approved</th>
<th>(Category/ies)</th>
<th>Recommended</th>
<th>(Category/ies)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not Approved</td>
<td>(Category/ies)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comments:**

<table>
<thead>
<tr>
<th><strong>General Education Subcommittee</strong></th>
<th>Approved</th>
<th>(Category/ies)</th>
<th>Recommended</th>
<th>(Category/ies)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not Approved</td>
<td>(Category/ies)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comments:**

<table>
<thead>
<tr>
<th><strong>Undergraduate Curriculum and Academic Policy Committee</strong></th>
<th>Approved</th>
<th>(Category/ies)</th>
<th>Recommended</th>
<th>(Category/ies)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not Approved</td>
<td>(Category/ies)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comments:**

<table>
<thead>
<tr>
<th><strong>Faculty Association Graduate Committee</strong></th>
<th>Approved</th>
<th>(Category/ies)</th>
<th>Recommended</th>
<th>(Category/ies)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not Approved</td>
<td>(Category/ies)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comments:**

<table>
<thead>
<tr>
<th><strong>Graduate Dean</strong></th>
<th>Approved</th>
<th>(Category/ies)</th>
<th>Recommended</th>
<th>(Category/ies)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not Approved</td>
<td>(Category/ies)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comments:**

<table>
<thead>
<tr>
<th><strong>Academic Affairs Council</strong></th>
<th>Approved</th>
<th>(Category/ies)</th>
<th>Recommended</th>
<th>(Category/ies)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not Approved</td>
<td>(Category/ies)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comments:**

<table>
<thead>
<tr>
<th><strong>Senior Vice President and Vice President for Academic Affairs</strong></th>
<th>Approved</th>
<th>(Category/ies)</th>
<th>Recommended</th>
<th>(Category/ies)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not Approved</td>
<td>(Category/ies)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comments:**

---

**Revised September 2002**
Required Minor: None.

NETWORKING EMPHASIS
Required for Emphasis (Communication, Mathematics, and Science, 36 credits):
CHEM 104 Introduction to Chemistry (3)
ENG 101 Composition (4)
ENG 271 Technical Communication (4)
MATH 115 Precalculus Mathematics (4)
MATH 121 Calculus I (4)
MATH 127 Calculus II for Engineering Technology: Integration (2)
MATH 180 Math for Computer Science (4)
PHYS 211 Principles of Physics I (4)
PHYS 212 Principles of Physics II (4)
SPEE 102 Public Speaking (3)

Required for Emphasis (COMS, 22 credits):
COMS 110 Foundation of Computer Science (4)
COMS 211 Introduction to C++ Programming (2)
COMS 212 Fundamentals of Computer Science I (4)
COMS 213 Fundamentals of Computer Science II (4)
COMS 340 Database Systems Management I (4)
COMS 380 Systems Analysis and Design (4)

Required for Emphasis (EET, 48 credits):
EET 113 D C Circuits (3)
EET 114 A C Circuits (3)
EET 221 Electronic CAD (3)
EET 222 Electronics I (4)
EET 225 Digital Principles (3)
EET 230 Microcomputer Technology (4)
EET 241 Electronic Shop Practices (2)
EET 430 Computer Networking I (4)
EET 431 Computer Networking II (4)
EET 454 Microprocessors I (4)
EET 456 Communications I (4)
EET 484 Microprocessors II (4)
EET 488 Senior Project Design I (1)
EET 489 Senior Project Design II (2)
EET 497 Internship (3)
* You may substitute one EET advanced elective for internship. Permission required.

Required Minor: None

POLICIES/INFORMATION
GPA Policy. Students graduating with a degree in Computer Engineering Technology must have (1) completed a minimum of 20 semester credit hours of upper division EET and COMS at MSU; (2) have a cumulative GPA of 2.0 or better on all upper division EET and COMS courses, and (3) have completed their senior design sequence at MSU.

P/N Grading Policy. A student who majors in CET must elect the grade option for all required courses including general education courses listed by number even if offered by another department.

If the credits earned for composition, technical writing and speech courses equal less than 9 credits, either an advanced speech course or a course in English language literature must be selected as a general elective.

Transfer of credit to the CET major is subject to policies described in this bulletin for all students transferring to MSU and to the following department policies:
1. All transfer students must take EET 221 if not proficient with current MSU software.
2. For courses taken at technical colleges/vocational technical schools and pertinent courses taken in the military the student may receive up to 8 credits upon review of course materials, grades and written approval by the program coordinator. These credits may be used for EET 112, 113, and 114.

3. For courses taken at community colleges and four-year colleges, up to 25 credits may be accepted if the transcript is from an ABET-accredited program. If the program is not accredited by ABET, up to 20 credits may be accepted. Grades of transfer credits must be C or better to be acceptable for substitution for required courses. Testing for course credit will be available via prior application made with the program coordinator. Students may not apply for credit by examination for an EET course in which they were previously enrolled at MSU or for any EET course above EET 225.

COURSE DESCRIPTIONS

Computer Science

COMS 110 (4) Foundation of Computer Science
This course provides a comprehensive introduction to the foundations of computer science. The topics covered include algorithms, pseudocode, computer theory, computer hardware, computer software, and the related social issues. Lab work develops familiarity with both hardware and software. The course is intended to provide knowledge and skills applicable to all disciplines while providing a broad introduction to the field of computer science.
Pre: MATH 112 (College Algebra)
GE-13

COMS 171 (2) Introduction to C++ Programming
This course provides an introduction to programming using C++. Emphasis is placed on structured programming concepts, with a brief discussion of object-oriented programming. Control structures, expressions, input/output, arrays, and functions.
F, S

COMS 211 (4) Fundamentals of Computer Science I
This is the first course in a two-course sequence for students who are planning to major or minor in computer science. The course emphasizes concepts needed for continuing study in computer science, the use of abstraction in program design, and advanced problem-solving skills. Programming in a high-level language is a focal point of the course. Prerequisite: A grade of A or B in COMS 110.
Coreq.: MATH 121 (Calculus I)

COMS 212 (4) Fundamentals of Computer Science II
This course is a continuation of 211. The course introduces students to object-oriented concepts and programming techniques. It also covers essential data structures such as linked lists, stacks, and queues, and trees. The student will be expected to produce larger applications, utilizing multiple compilation units.
Prerequisite: COMS 211

COMS 480 (4) Software Engineering
This is a course in software engineering that introduces the student to the important aspects of the discipline. The main purpose of this course is to simulate the engineering of a software product, from gathering requirements through implementation and maintenance. The course emphasizes a traditional development methodology. Students will be introduced to Visual Basic and Microsoft Project, but the emphasis of the course will be on principles of software engineering including project planning, requirements gathering, size and cost estimation, analysis, design, coding, testing, and implementation.
Pre: COMS 280 and 340 F, S

COMS 380 (4) Systems Analysis & Design
This course explores both structured as well as object-oriented systems analysis and design. Use of upper and lower CASE tools are employed in the analysis, design, and implementation of a team-oriented term project.
Pre: COMS 212 F, S

2004-2005 Undergraduate Bulletin 105
MATH 121 Calculus I (4)
MET 427 Quality Assurance (2)

Choose one of the following:
COMS 212 Fundamentals of Computer Science II (4)
COMS 230 Intelligent Systems (4)
COMS 271 C++ Programming (4)
COMS 380 System Analysis and Design (4)

**Required for Major (Communication, Mathematics and Science, 16 credits):**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 271</td>
<td>Technical Communication</td>
<td>(4)</td>
</tr>
<tr>
<td>MATH 127</td>
<td>Calculus II for Engineering Technology: Integration (2)</td>
<td></td>
</tr>
<tr>
<td>PHYS 212</td>
<td>Principles of Physics II (4)</td>
<td></td>
</tr>
<tr>
<td>CHEM 104</td>
<td>Introduction to Chemistry</td>
<td>(3)</td>
</tr>
</tbody>
</table>

Choose one of the following:
STAT 154 Elementary Statistics (3)
MATH 354 Concepts of Probability and Statistics (3)

**Required Core for Major (EET, 55 credits):**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EET 113</td>
<td>DC Circuits (3)</td>
<td></td>
</tr>
<tr>
<td>EET 114</td>
<td>AC Circuits (3)</td>
<td></td>
</tr>
<tr>
<td>EET 221</td>
<td>Electronic CAD (3)</td>
<td></td>
</tr>
<tr>
<td>EET 222</td>
<td>Electronics I (4)</td>
<td></td>
</tr>
<tr>
<td>EET 223</td>
<td>Electronics II (4)</td>
<td></td>
</tr>
<tr>
<td>EET 225</td>
<td>Digital Principles (3)</td>
<td></td>
</tr>
<tr>
<td>EET 241</td>
<td>Electronic Shop Practices (2)</td>
<td></td>
</tr>
<tr>
<td>EET 355</td>
<td>Electrical Power Systems (3)</td>
<td></td>
</tr>
<tr>
<td>EET 400</td>
<td>Network Analysis (3)</td>
<td></td>
</tr>
<tr>
<td>EET 452</td>
<td>Operational Amplifier Applications (3)</td>
<td></td>
</tr>
<tr>
<td>EET 454</td>
<td>'Microprocessors I (4)</td>
<td></td>
</tr>
<tr>
<td>EET 456</td>
<td>Communications I (4)</td>
<td></td>
</tr>
<tr>
<td>EET 458</td>
<td>Advanced Instrumentation (1)</td>
<td></td>
</tr>
<tr>
<td>EET 480</td>
<td>Automatic Controls (3)</td>
<td></td>
</tr>
<tr>
<td>EET 488</td>
<td>Senior Project Design I (1)</td>
<td></td>
</tr>
<tr>
<td>EET 489</td>
<td>Senior Project Design II (2)</td>
<td></td>
</tr>
<tr>
<td>EET 497</td>
<td>Internship (3)</td>
<td></td>
</tr>
</tbody>
</table>

Choose a minimum of 6 credits from the following courses:
EET 425, EET 430, EET 435, EET 484, EET 486, EET 487, EET 492

* You may substitute one EET advanced elective for internship.

**Electrical Engineering Technology Minor**

**Required for Minor (Core, 13 credits):**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EET 112</td>
<td>Elementary Electronics (3)</td>
<td></td>
</tr>
<tr>
<td>EET 113</td>
<td>DC Circuits (3)</td>
<td></td>
</tr>
<tr>
<td>EET 114</td>
<td>AC Circuits (3)</td>
<td></td>
</tr>
<tr>
<td>EET 222</td>
<td>Electronics I (4)</td>
<td></td>
</tr>
</tbody>
</table>

**Required for Minor (Elective Options, 7-8 credits):**

**Digital Option**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EET 225</td>
<td>Digital Principles (3)</td>
<td></td>
</tr>
<tr>
<td>EET 454</td>
<td>Microprocessors I (4)</td>
<td></td>
</tr>
</tbody>
</table>

**Electronics Option**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EET 223</td>
<td>Electronics II (4)</td>
<td></td>
</tr>
</tbody>
</table>

**Networking Option**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EET 230</td>
<td>Microcomputer Technology (4)</td>
<td></td>
</tr>
<tr>
<td>EET 430</td>
<td>Computer Networking I (4)</td>
<td></td>
</tr>
</tbody>
</table>

**Communications Option**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EET 223</td>
<td>Electronics II (4)</td>
<td></td>
</tr>
<tr>
<td>EET 456</td>
<td>Communications I (4)</td>
<td></td>
</tr>
</tbody>
</table>

**Power Option**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EET 223</td>
<td>Electronics II (4)</td>
<td></td>
</tr>
<tr>
<td>EET 355</td>
<td>Electrical Power Systems (3)</td>
<td></td>
</tr>
</tbody>
</table>

**Policies/Information**

Graduation Policy. Students graduating with a degree in Electronic Engineering Technology must have: 1) completed a minimum of 20 semester credit hours of upper division EET courses; 2) have a cumulative GPA of 2.0 or higher for all MSU EET coursework; and 3) have completed their senior design sequence at MSU.

P/N Grading Policy. A student who majors or minors in EET must elect the grade option for all required courses including general education courses listed by number even if offered by another department.

If the credits earned for composition, technical writing and speech courses equal less than 9 credits, either an advanced speech course or a course in English language literature must be selected as a general elective.

In addition to the transfer of credit policy described in this bulletin for students transferring to MSU from other schools, the electronic engineering program has additional policies:

1. All transfer student must take EET 221.
2. For courses taken at technical colleges/vocational technical schools and pertinent courses taken in the military the student may receive up to 8 credits upon review of course materials, grades and written approval by the program coordinator. The credit can be used for EET 112, 113 and 141. The student may also attempt to test out of EET 114, 222, 225 and 223.
3. For courses taken at community colleges and four-year colleges, up to 25 credits may be accepted if the transcript is from an ABET-accredited program. If the program is not accredited by ABET, up to 20 credits may be accepted. Grades of transfer credits must be C or better to be acceptable for substitution for required courses.

Testing for core course will be available via prior application made with the program coordinator. Students may not apply for credit by examination for an EET course in which they were previously enrolled at MSU or for any EET course above EET 225.

**Course Descriptions**

**EET 101 (1) Introduction to EET/CET**
Creative problem solving. Group projects working with simple robots which provide the student with: an introduction to electronic schematics and parts; an introduction to computer hardware and software; and, an introduction to robotics.
F

**EET 112 (3) Elementary Electronics**
Hands-on experiences in elementary electronics to easily and quickly develop basic knowledge of electronics related to simple analog and digital circuit and components. A self paced format with an open laboratory is used.
F, S
GE-3

**EET 113 (4) DC Circuits**
A study of DC electrical circuits, Kirchhoff’s laws, series and parallel circuits, inductors, capacitors, circuit response to RL, RC and RLC circuits. Thevenin’s equivalent circuit theorem, and other network analysis theorems. Use of dependent sources in DC circuits.
Pre: MATH 115, or concurrent F, S

**EET 114 (3) AC Circuits**
Pre: EET 113 and MATH 115 F, S

2004-2005 Undergraduate Bulletin 127
Minutes of the meeting of the Department of Electrical and Computer Engineering and Technology, 13 October 2004

Present: Gale Allen, Suraj Amatya, Mark Dvorak, William Hudson, Rajiv Kapadia, Muhammad Khaliq, Pentti Lappalainen, Paul Lindfors, Julio Mandojana, Andrew Miner, RA Nair.

The meeting was called to order by Department Chairman, William Hudson

1. The minutes of the meeting of 6 October were approved with a minor technical correction.

2. Good News:
   a. May '04 EET graduate Aaron Dahlen had an article published in Circuit Cellar magazine regarding his senior design project.
   b. The IEEE Section in Rochester presented a check for $500 to the students attending the section meeting in Rochester on Monday. This funding I believe will be used to pay for the attendance of the Student Branch president and vice-president to a leadership training conference at Purdue University 16-18 October.

3. There was continuing discussion of the Spring Semester teaching schedule and scheduling in general for the future. A spread sheet was distributed so faculty could make known their preferences for teaching or not-teaching courses. This spreadsheet will be available in the office for review an faculty input. It was noted that scheduling was very tight with the spring semester EET courses used as an example.

4. Hudson advocated publication of a policy for evaluation of transfer credit by the department not later than the first semester the student is enrolled. This was approved with any exceptions requiring approval of the department faculty.

5. Course outcomes described in Attachment #2 for the courses listed below were reviewed.

   EET-452 Outcomes were approved
   EE-332 Outcomes were approved
   EET-101 Addition of interpretation of graphs and statistics was discussed but not accepted. The outcomes were approved
   EET-355 Outcomes were approved
   EE-333 Outcomes were approved
   EET-456 Outcomes were approved
   EET-430 Outcomes were approved
   EET-431 Outcomes were approved
   EET-488 There was spirited discussion of individual vs. team projects. The outcomes describe team projects and they were approved
   EET-489 Same comments as for EET-488
   EE-254 Outcomes were approved