

07271



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):		Proposal #	359
College:	Science, Engineering and Technology	<input checked="" type="checkbox"/>	Undergraduate	Effective Date of Change:	
Department:	Electrical and Computer Engineering and T	<input type="checkbox"/>	Graduate	Academic Year	06-07
Program:	Electronic Engineering Technology	CIP # _____		(For Office Use Only)	
Type of Change	PROGRAM PROPOSALS			Course Designator	Number of
Proposed:	Redesign--Change in Degree Award WONT			and Number	Credits
Title Current:	Electronic Engineering Technology degree requirements				
Title Proposed:					
24-Char. Abbrev:					(if applicable)

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

Program description should remain as is currently in the bulletin.

Rationale or Justification for change:

We believe that the changes proposed are required for our program to remain current and to allow us to remain accredited.

For General Education or Cultural Diversity Courses Only

General Education Course:		Cultural Diversity Course:	
GE Category #	GE Category Name (Maximum of 3 Categories)	(Please check one.)	
N/A		<input type="checkbox"/>	Core (At least 75% devoted to topics of race, gender, sexual orientation, age, class, and disabilities as they occur in United States Society.)
N/A		<input type="checkbox"/>	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.)
N/A			

? 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:

- Syllabus or course outline.
- Course's student learning outcomes associated with each GE competency or CD designation.
- List of strategies to be used to assess students' achievement of each GE competency or CD designation.

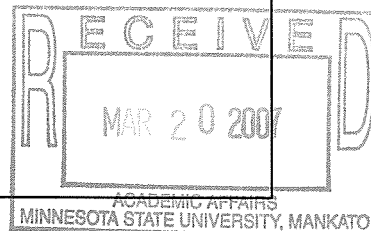
For New Courses

(Check all that apply):		Instructional Type:	Lecture	Course will be offered:	
<input type="checkbox"/>	Course is an elective.	Grading Format:	<input type="checkbox"/> Grade <input type="checkbox"/> P/N	<input type="checkbox"/>	Fall Semester
<input type="checkbox"/>	Course is required for program			<input type="checkbox"/>	Spring Semester
<input type="checkbox"/>	Pre- or Co-requisites:			<input type="checkbox"/>	Summer Session
<input type="checkbox"/>	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:

- Syllabus or course outline.
- Course's student learning outcomes.
- A list of resources required to offer and support this course.
- A description of how teaching this course will affect department staffing.
- If 400/500 level course, an explanation of added expectations of graduate students.





Minnesota State University, Mankato
Curriculum Proposal

Signature Page

Department

Recommended (Category/ies _____)
 Not Recommended (Category/ies _____)

Wile B. Hudson
 Department Chair

Feb 28/07
 Date

Comments:

College Curriculum Committee

Recommended (Category/ies _____)
 Not Recommended (Category/ies _____)

Kam C. Chou
 Committee Chair

3/9/07
 Date

Comments:

College Dean

Recommended (Category/ies _____)
 Not Recommended (Category/ies _____)

[Signature]
 Dean

3/19/07
 Date

Comments:

General Education Subcommittee

Recommended (Category/ies _____)
 Not Recommended (Category/ies _____)

 General Education Subcommittee Chair

 Date

Comments:

Undergraduate Curriculum and Academic Policy Committee

Recommended (Category/ies _____)
 Not Recommended (Category/ies _____)

[Signature]
 UCAP Faculty Chair

4/18/07
 Date

Comments:

Faculty Association Graduate Committee

Recommended
 Not Recommended

 Faculty Association Graduate Chair

 Date

Comments:

Graduate Dean

Recommended
 Not Recommended

 Graduate Dean

 Date

Comments:

Academic Affairs Council

Recommended (Category/ies _____)
 Not Recommended (Category/ies _____)

[Signature]
 Assistant Vice President

4/20/07
 Date

Comments:

Senior Vice President and Vice President for Academic Affairs

Approved (Category/ies _____)
 Not Approved (Category/ies _____)

Scott R. Okonjo
 Sr. Vice President / Vice Pres. Academic Affairs

4/20/07
 Date

Comments:

Memorandum

To: Course and Curriculum Committees
CC: [Click [here](#) and type name]
From: William B Hudson, Chair ECET
Date: February 15, 2007 (Information previously provided – revised here for clarity)
Re: Electronic Engineering Technology Curriculum Changes

Attached please find the revised curriculum for the Electronic Engineering Technology degree program. Please be aware that many of the courses required for the Computer Engineering Technology degree are also required for the Electronic Engineering Technology degree so that changes in both Electronic and Computer Engineering Technology degree programs need to be reviewed and considered jointly.

Specific points to note:

- Because of required sequencing of courses to meet prerequisites changes in the program are first shown a previous student advising form. A student advising form which shows proposed changes to the program is also provided. These forms demonstrate that a student taking the proposed course sequences would be able to complete the program in four years
- Changes in this program still allow the student to meet university general education requirements without exceeding 128 credits in their programs of study
- Course additions proposed as part of this proposal include, EET 141, EET 142, and EET 143 to help in addressing student retention issues through integrated freshmen year departmental hands on courses
- A change in course number EET 454 to EET 254 to allow course repositioning in the curriculum is being proposed to better meet the needs of transfer students
- Additional courses added for the degree include EET 310, EET 340, EET 461 and EET 462. These courses are being added to provide students better preparation in topics relevant to Computer Engineering Technology as recommended by our Industrial Advisory Board
- The total credit hours required for the Electronic Engineering Technology degree would not change with the proposed curriculum changes.

Provided in support of this proposal and identified as attachment 2 are the required program student learning outcomes as defined by our accreditation agency ABET. These outcomes listed as topics a-

k are supported by course outcomes which have been created for all courses and mapped to the provided learning outcomes.

Minutes of department meetings supporting these changes are provided and marked as attachment 3.

Our program accreditation requires both assessment and improvement. Accreditation Criteria 3 requires that we evaluate and determine that the Electronic Engineering Technology program prepares students to meet career and professional requirements normally one to five years after graduation. It is required that we have in place a process by which we determine this and use the results to improve our Electronic Engineering Technology program. Further Criteria 3 of our accreditation requires that we assess program outcomes (competencies at graduation) and use these results to improve the Electronic Engineering Technology program. An overview of the assessment plan for the Electronic Engineering Technology program is provided as attachment 4.

As can be seen the changes in the Electronic Engineering Technology program has implications for courses in Computer Science. Correspondence related to these changes can be found marked as attachment 5.

Resources

Resources required to support the changes will occur through departmental reallocation of existing resources and will change only as student numbers increase as would occur with the existing curriculum.

Staffing

Departmental staffing is adequate to address the program changes. Staffing needs will change only as student numbers change which would occur with the current program.

Library Needs

No changes would occur relative to necessary library holdings.

Bulletin Copy

Changes in bulletin copy should only reflect changed course offering and program requirements as provided in the supporting materials.

Student Name _____
 Tech ID _____
 Cumulative GPA _____
 MSU GPA _____
 Hours Employed/wk _____
 Requested Courses for _____ Semester Year
 Do you have transfer coursework?
 Yes No

Advisor Review/Office Use Only
 Initial _____
 Date _____
 General Transfer Evaluation Complete
 Yes No N/A
 Core Transfer Evaluation Complete
 Yes No N/A
 Completed Competency Exam
 Yes No Date _____

**ECET Course Advising
 ELECTRONIC ENGINEERING TECHNOLOGY
 2005-2006 Bulletin
 MINNESOTA STATE UNIVERSITY, MANKATO**

*This information is true and accurate to the best of my knowledge
 Student Signature _____*

<u>Year Taken</u>	<u>Freshman(FALL)</u>	<u>Grade</u>
_____	COMS 110 Intro to Comp Sci	_____
_____	EET 113 DC Circuits	_____
_____	ENG 101 English Comp	_____
_____	MATH 115 Pre-Calculus	_____
_____	General Education _____	_____
_____	EET 101 Intro to EET/CET	_____
	(Not required, Recommended)	

<u>Year Taken</u>	<u>Freshman(SPRING)</u>	<u>Grade</u>
_____	COMS 211 Fund of Comp Science I	_____
_____	EET 114 AC Circuits	_____
_____	MATH 121 Calculus I	_____
_____	SPEE 102 Public Speaking	_____
_____	General Education _____	_____

<u>Year Taken</u>	<u>Sophomore(FALL)</u>	<u>Grade</u>
_____	COMS*** - Restricted Elective	_____
_____	EET 221 Electronic CAD	_____
_____	EET 222 Electronics I	_____
_____	PHYS 211 Prin of Physics I	_____
_____	MATH 127 Calc II for ET	_____

<u>Year Taken</u>	<u>Sophomore(SPRING)</u>	<u>Grade</u>
_____	EET 223 Electronics II	_____
_____	EET 225 Digital Principles	_____
_____	EET 241 Electronic Shop Practice	_____
_____	PHYS 212 Principles of Physics II	_____
_____	General Education _____	_____

<u>Year Taken</u>	<u>Junior(FALL)</u>	<u>Grade</u>
_____	CHEM 104 Intro to Chem	_____
_____	EET 355 Elecl Power Sys	_____
_____	EET 452 Op Amp App	_____
_____	ENG 271 Tech Comm	_____
_____	General Education _____	_____

<u>Year Taken</u>	<u>Junior(SPRING)</u>	<u>Grade</u>
_____	EET 400 Network Analysis	_____
_____	EET 454 Microprocessors I	_____
_____	EET 456 Communications I	_____
_____	EET 458 Advanced Instrumentation	_____
_____	STAT 154 Elementary Statistics	_____
	OR MATH 354 Con. Of Prob & Stat	

<u>Year Taken</u>	<u>Senior(FALL)</u>	<u>Grade</u>
_____	EET Advanced Elective*	_____
_____	EET 480 Automatic Controls	_____
_____	EET 488 Sen Proj Design I	_____
_____	MET 427 Quality Assurance	_____
_____	General Education _____	_____
_____	EET 497 Internship**	_____

<u>Year Taken</u>	<u>Senior(SPRING)</u>	<u>Grade</u>
_____	EET Advanced Elective*	_____
_____	EET 489 Senior Project Design II	_____
_____	General Education _____	_____
_____	General Education _____	_____

*EET Advanced Electives: EET 425, 430, 455, 484, 486, 487 and 492 (minimum of 6 credits)

**You may substitute one EET advanced elective for internship - Permission required.

*** COMS Restricted Elective (Select one): COMS 212,230,271 or 380.

GPA: Must have 20 or more credits upper division EET courses at MSU Yes No; Have a cumulative GPA of 2.0 or better for all upper level EET courses Yes No; Have completed senior design sequence at MSU Yes No

Grading Policy – All courses must (including general education) must be taken for grade.

Upper level EET GPA _____

General Education Requirements met Yes No; MSU GPA _____

Student Name _____
 Tech ID _____
 Cumulative GPA _____
 MSU GPA _____
 Hours Employed/wk _____
 Requested Courses for _____ Semester Year
 Do you have transfer coursework?
 Yes No

Advisor Review/Office Use Only
 Initial _____
 Date _____
 General Transfer Evaluation Complete
 Yes No N/A
 Core Transfer Evaluation Complete
 Yes No N/A
 Completed Competency Exam
 Yes No Date _____

**ECET Course Advising
 ELECTRONIC ENGINEERING TECHNOLOGY
 2007-2008
 MINNESOTA STATE UNIVERSITY, MANKATO**

This information is true and accurate to the best of my knowledge Student Signature _____

<u>Yr Tkn</u>	<u>Freshman (FALL)</u>	<u>Grade</u>	<u>Yr Tkn</u>	<u>Freshman (SPRING)</u>	<u>Grade</u>
_____	ENG 101 English Comp (4)	_____	_____	SPEE 102 Public Speaking (3)	_____
_____	MATH 115 Pre-Calculus (4)	_____	_____	MATH 121 Calculus I (4)	_____
_____	EET 113 DC Circuits (3)	_____	_____	EET 114 AC Circuits (3)	_____
_____	EET 141 Int. Comp. Tech. I (4)	_____	_____	EET 142 Int. Comp. Tech. II (4)	_____
_____	General Education	_____	_____	General Education	_____
<u>Yr Tkn</u>	<u>Sophomore (FALL)</u>	<u>Grade</u>	<u>Yr Tkn</u>	<u>Sophomore (SPRING)</u>	<u>Grade</u>
_____	PHYS 211 Prin of Physics I (4)	_____	_____	PHYS 212 Principles of Physics II (4)	_____
_____	EET 222 Electronics I (4)	_____	_____	EET 223 Electronics II (4)	_____
_____	EET 143 Int. Comp. Tech. III (4)	_____	_____	EET 254 Microprocessor I (4)	_____
_____	EET 221 Electronic CAD (3)	_____	_____	EET 241 Elec. Shop Practice (2)	_____
_____	MATH 127 Calc II for ET (2)	_____	_____	General Education	_____
_____	General Education	_____			
<u>Yr Tkn</u>	<u>Junior (FALL)</u>	<u>Grade</u>	<u>Yr Tkn</u>	<u>Junior (SPRING)</u>	<u>Grade</u>
_____	EET 484 Microprocessors II (4)	_____	_____	EET 456 Communications I (4)	_____
_____	EET 452 Op Amp App (3)	_____	_____	EET 340 Prog. Hardware Tech (4)	_____
_____	EET 355 Elect Power Sys (3)	_____	_____	STAT 154 Elementary Statistics (3)	_____
_____	General Education	_____	_____	CHEM 104 Intro to Chem (3)	_____
			_____	General Education	_____
<u>Yr Tkn</u>	<u>Senior (FALL)</u>	<u>Grade</u>	<u>Yr Tkn</u>	<u>Senior (SPRING)</u>	<u>Grade</u>
_____	EET 461 Indust Automation I (4)	_____	_____	EET 462 Indust Automation II (4)	_____
_____	MET 427 Quality Mgt Sys (3)	_____	_____	EET Advanced Elective*	_____
_____	General Education	_____	_____	General Education	_____
_____	EET Advanced Elective*	_____			
_____	EET 497 Internship**	_____			

*11 Credits of EET Advanced Required are required: EET 425, 430, 452, 455, 482, 486, 487 and 492.

**You may substitute one EET advanced elective for internship - Permission required.

Must have 20 or more credits upper division EET at MSU Yes No

Must have a cumulative GPA of 2.0 or better for all upper level EET courses Yes No;

General Education Requirements met Yes No

Upper level EET GPA _____ MSU GPA _____

Electronic Engineering Technology		Proposed Program Changes	
Current Program		Proposed Program	
English Composition (4 Credits)	Credit Hours	English Composition (4 Credits)	Credit Hours
ENG 101 Composition	4	ENG 101 Composition	4
Mathematics (13 Credits)		Mathematics (13 Credits)	
MATH 115 Precalculus Mathematics	4	MATH 115 Precalculus Mathematics	4
MATH 121 Calculus I	4	MATH 121 Calculus I	4
MATH 127 Calculus II for Engineering Technology	2	MATH 127 Calculus II for Engineering Technology	2
STAT 154 Elementary Statistics or	3	STAT 154 Elementary Statistics	3
MATH 354 Concepts of Probability and Statistics	3		
Chemistry (3 Credits)		Chemistry (3 Credits)	
CHEM 104 Introduction to Chemistry	3	CHEM 104 Introduction to Chemistry	3
Physics (8 Credits)		Physics (8 Credits)	
PHYS 211 Principles of Physics I	4	PHYS 211 Principles of Physics I	4
PHYS 212 Principles of Physics II	4	PHYS 212 Principles of Physics II	4
Computer Science (12 Credits)		Computer Science (0 Credits)	
COMS 110 Foundation of Computer Science	4		
COMS 211 Fundamentals of Computer Science	4		
COMS 212 Fundamentals of Computer Science II or	4		
COMS 230 Intelligent Systems or	4		
COMS 271 C++ Programming or	4		
COMS 380 Systems Analysis and Design	4		
Manufacturing Engineering Technology (3 Credits)		Manufacturing Engineering Technology (3 Credits)	
MET 427 Quality Management Systems	3	MET 427 Quality Management Systems	3
General Studies (7 Credits)		General Studies (3 Credits)	
ENG 271 Technical Communication	4		
SPEE 102 Public Speaking	3	SPEE 102 Public Speaking	3
Required Courses (49 Credits)		Required Courses (64 Credits)	
EET 113 DC Circuits	3	EET 113 DC Circuits	3
EET 114 AC Circuits	3	EET 114 AC Circuits	3
EET 221 Electronic CAD	3	EET 221 Electronic CAD	3
EET 222 Electronics I	4	EET 222 Electronics I	4
EET 223 Electronics II	4	EET 223 Electronics II	4
EET 225 Digital Principles	3		
EET 241 Electronics Shop Practices	2	EET 241 Electronics Shop Practices	2
EET 355 Electrical Power Systems	3	EET 355 Electrical Power Systems	3
EET 400 Network Analysis	3		
EET 452 Operational Amplifier Applications	3	EET 452 Operational Amplifier Applications	3
EET 454 Microprocessors I	4		
EET 456 Communications I	4	EET 456 Communications I	4
EET 458 Advanced Instrumentation	1		
EET 480 Automatic Controls	3		
EET 488 Senior Project Design I	1		
EET 489 Senior Project Design II	2		
EET 497 Internship*	3	EET 497 Internship*	3
Elective Courses (6 Credits)			
EET 425 Advanced Digital Design	3		
EET 430 Computer Networking I	4		
EET 455 Advanced Power Electronics	3		
EET 484 Microprocessors II	4	EET 484 Microprocessors II	4
EET 486 Communications II	3		
EET 487 RF Systems Technology	3		
EET 492 Integrated Circuit Technology	4		
Other General Education Courses to meet 128	23	EET 141 Introduction to Computer Technology I**	4
Total Credits	128	EET 142 Introduction to Computer Technology II	4
		EET 143 Introduction to Computer Technology III	4
		EET 254 Microprocessors I	4
		EET 340 Programming Hardware Technology	4
		EET 461 Industrial Automation I	4
		EET 462 Industrial Automation II	4
		Elective Courses (11 Credits)	
		EET 425 Advanced Digital Design	3
		EET 430 Computer Networking I	4
		EET 452 Operational Amplifier Applications	3
		EET 455 Advanced Power Electronics	3
		EET 482 Device Technology W3H	4
		EET 486 Communications II	3
		EET 487 RF Systems Technology	3
		EET 492 Integrated Circuit Technology	4
		Other General Education Courses to meet 128	19
		Total Credits	128

* May be replaced with advanced elective

** To count toward general education as well

Attachment 2 Electronic Engineering Technology Student Learning Outcomes

Student completing the electronic engineering technology degree program will:

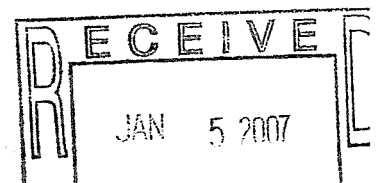
- a. have an appropriate mastery of the knowledge, techniques, skills and modern tools of their disciplines,
- b. have an ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology,
- c. have an ability to conduct, analyze and interpret experiments and apply experimental results to improve processes,
- d. have an ability to apply creativity in the design of systems, components or processes appropriate to program objectives,
- e. be able to function effectively on teams,
- f. be able to identify, analyze and solve technical problems,
- g. be able to communicate effectively,
- h. have a recognition of the need for, and an ability to engage in lifelong learning,
- i. be able to understand professional, ethical and social responsibilities,
- j. respect diversity and have knowledge of contemporary professional, societal and global issues, and
- k. have a commitment to quality, timeliness, and continuous improvement.

Attachment 3

Minutes of the Meeting of part of the faculty of Department of Electrical and Computer Engineering and Technology
31 October 2006

Present: Han-way Huang, William Hudson, Julio Mandojana, Thomas Hendrickson, John Caven, Muhammad Khaliq,
Vincent Winstead, Paul Lindfors

1. The minutes of the meeting of 3 October 2006 were approved.
2. Department Good News
 - 2.1 IEEE speakers
 - 2.2 IEEE tour of Winland Electronics on Monday, 30 October
 - 2.3 Grants?
 - 2.4 Grant applications
3. The personnel committee will be forthcoming in the near future regarding the request by Dr. Kapadia to be promoted to rank of Full Professor.
4. Faculty interested in teaching summer courses need to apply to Dr. Hudson soon. Those who have expressed interest thus far are: Khaliq, Kapadia, Mandojana and Winstead. The courses that will probably be offered are EE-230 and EE-231.
5. Some graduate courses have experienced a problem with insufficient enrollment. The department needs to develop a system of written commitment by graduate students so the department can plan the courses and teaching loads more effectively. Ideas were forwarded, but no action was taken.
6. Thanks to Mandojana and Allen for preparation of course and program materials and Mandojana and Hudson for steering the course and curriculum changes through the Course and Curriculum Committee of the college. The process was tedious but necessary. The faculty had reviewed and approved the Course and Curriculum materials previously but to provide a clear paper trail Hudson and Winstead will circulate a form that will preserve a written record of faculty approval of the course and curriculum changes by way of email.
7. Mandojana will tour Winstead and Zhang through Goodrich so possible courses for Spring Semester 2007 can be identified. Planning for this tour will be done by the 3 participants.
8. Hudson was surprised by the announcement regarding IEEE publications and a complete shift to electronic forms that arrived from the library. Several faculty noted the absence of journals they thought had once were present. The rushed schedule and extent of the changes will be investigated by Hudson.
9. Jeff Pribyl of Chemistry and Geology has been discussing with the engineering program heads the development of a new, 3-credit chemistry course for engineering students. This course would have no laboratory. Such a course would allow electrical, mechanical and computer engineering students greater program flexibility but the laboratory component may be needed by civil engineering students. It was agreed that students could still take Chemistry-201 in place of the new course when it is offered.
10. Other issues were tabled.



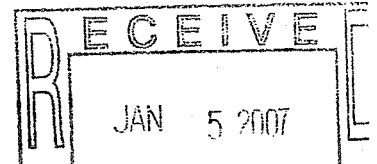
INTEROFFICE MEMORANDUM

TO: COURSE AND CURRICULUM COMMITTEE
FROM: WILLIAM B HUDSON, CHAIR ECET
SUBJECT: DEPARTMENT VOTE ON PROGRAM CHANGES
DATE: 11/7/2006
CC: [CLICK HERE AND TYPE NAME]

The ECET department has invested many meetings during the last two years to the refinement of all of the department programs. The department faculty have had many votes as we have worked to refine the curriculum to best serve our students and our constituent groups. The final affirmation of these changes has been accomplished by an email vote sent to faculty after changes recommended by the College Course and Curriculum were implemented - Email attached as well as program summaries.

The results of email vote are as follows:

Electronic Engineering Technology	Approve 8	Disapprove 1
Computer Engineering Technology	Approve 9	Disapprove 0
Electrical Engineering	Approve 9	Disapprove 0
Computer Engineering	Approve 9	Disapprove 0



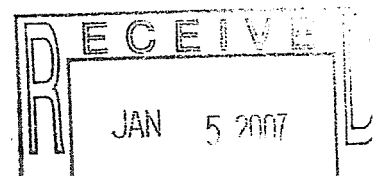
Minutes of the Meeting of part of the faculty of Department of Electrical and Computer Engineering and Technology
07 November 2006

Present: Gale Allen, Han-way Huang, William Hudson, Paul Lindfors, Julio Mandojana , R. A. Nair, Mahbubur Syed, Vincent Winstead, Vincent Zhang

1. Presentation by Diane Richards, Collection Development Librarian: Questions regarding change to electronic form of journals and possibility of "missing" journals were answered. Receiving the journals in electronic form will duplicate the printed journals now received plus add others. The apparently "missing" journals are still present in printed form.
2. The minutes of the meeting of 31 October 2006 were approved.
3. Curriculum issues dominated the meeting. Hudson reported that all program changes that were approved previously were not going to be approved by the Dean because of staffing issues. Working with David Haglin of CIS many changes were preserved while some changes were not included or a compromise with CIS was worked out. A list of the present and revised programs that are expected to be approved for EE, CompE, EET, and CompET are attached. No easy summary of the situation can be made. Motion made and seconded all present voted to move forward with the programs as defined in the attached forms.
4. Summer teaching remained as reported previously: 1) courses that would be offered would be EE-230 and 231 and 2) interested faculty are Kapadia, Khaliq, Mandojana, and Winstead.
5. Khaliq went home sick this afternoon so the procedure and timetable for review of materials and decision regarding the submission for promotion from Kapadia will be announced later.
6. Allen distributed a list of general education courses for engineering technology majors that cover multiple categories. This list should aid students to complete their degree programs in the minimum 128 credits and the list should be used during pre-registration reviews on Thursday and Friday. A copy is attached.
7. Upon suggestion by the Dean the department agreed to drop the courses listed below because they will not be included in the revised programs:

EE-101, 380, 462

EET_101, 225, 230, 400, 480, 488, 489



Electrical and Computer Engineering and Technology Department
Program and Course Assessment

Educational Objective Assessment (1-5 years after graduation)

Efforts are made to contact graduates of all department programs for at least five years following graduation. Surveys are used based on the major that ask graduates for their impressions on how their program of study prepared them for their career. Information from these surveys is fed back into the program to make improvements. Both students and faculty are involved in this effort.

Constituent Input

Input from Internship employers is gathered through internship reports to assist in program assessment and improvement. Further input is obtained by faculty through the use of company survey forms to determine specific company skill set needs. Information from these surveys and reports is used to refine curriculum to better meet the needs of employers as they use ever evolving technologies.

Course Assessment

Outcomes are established for each course that map to the required ABET a-k outcomes for each of the degree offerings. Each instructor in the ECET department is responsible for assessing student competency in each course outcome area. This information is gathered each semester and is reviewed by the department assessment committee which then makes recommendations to the ECET faculty regarding possible improvement areas. All department faculty scan examples of student work to create assessment portfolios to support our accreditation and assessment efforts.

Student Input for Assessment

Input from students in all department programs is solicited by a student advisory board meeting and through the use of online surveys supported through MSU assessment office. The surveys are offered students each semester and solicit and analyze responses by program of study and by year in the program. As with all of the other assessment tools this information is fed back into the assessment loop to support program improvement efforts.

ATTACHMENT #5

Hudson, William B

From: Haglin, David
Sent: Tuesday, November 07, 2006 11:45 AM
To: Hudson, William B
Subject: Dropping COMS courses

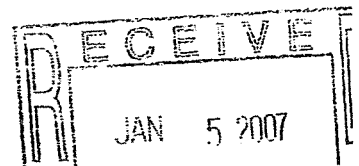
Bill Hudson,

I am writing to acknowledge that your department has been keeping the CIS department informed of your intended curricular changes that include dropping several COMS courses from your CE and CET majors. I understand that these changes reflect the feedback you have received from your advisory board, and I have been happy to work with you on providing some replacement courses that make sense (CS 320 and CS 360) for your majors.

Sincerely,

David Haglin

Dr. David J. Haglin, Chair
Computer and Information Sciences Department
Minnesota State University, Mankato, MN 56001
<http://theory.cs.mnsu.edu/haglin>



Minnesota State Colleges and Universities PROGRAM REDESIGN APPLICATION

RELATED POLICY or STATUTE: MS 1996, Ch. 368, Sec. 33; MS 1995, Ch. 248, Article 11, Sec. 10; and MS 1996, Ch. 398, Sec. 38; Board Policy 3.14, 3.17, 3.19

[This form is designed for electronic use. You should have some familiarity with the Word table-making function. Enter your information in the correct box on the Tables below.] Please submit an individual form for each program you are redesigning. Multiple changes to the same program may be made on the same form. You may delete all the tables that do not apply to your redesign request.]

SECTION I: DESCRIPTION OF CURRENTLY APPROVED PROGRAM

8-Digit CIP #	Program Name Electronic Engineering Technology	Award Bachelor of Science	Cr Length 128	Location/s MSU, Mankato
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Name of affiliated educational institution that offers one or more credits in this program: none

Is this award jointly offered: Yes No - No

SECTION II: PROPOSED CHANGES TO PROGRAM

Effective start date/s: Fall 2007

Rationale for Proposed Change/s: Support needed curricular reforms

Section IIA: NAME CHANGE

Current:

Proposed:

Section IIB: CIP CHANGE*

Current:

Proposed:

Current Program Outcomes:

Proposed Program Outcomes:

*Contact staff to determine whether change is permitted as a redesign, or whether a new program proposal is required.

Section IIC: CHANGE CREDIT LENGTH WITHIN POLICY

Previous:

Proposed:

Section IID: CHANGE CREDIT LENGTH TO EXCEED POLICY

Credit length beyond the policy limits will be approved only if one or more of the following conditions exist: a) the length is required by a state or national licensing body or other regulatory agency, accrediting association, or board; b) the program is employer-sponsored where the employer specifies the required credits as a condition for conferring the award; or c) a formal task analysis has been conducted within the last three years and the results endorsed by an advisory committee. Request for a program length in excess of policy from a professional association or advisory committee is not sufficient for approval.

Previous Length:

Proposed Length:

State Rationale for Exceeding Policy Limits (Attach evidence as appropriate in an appendix):

Section IIE: ADD CURRICULUM ALTERNATIVE/S*

Name: _____ CIP Code: _____ Total Credits: _____

Option or Emphasis or certificate that is a subcredential of existing award (choose one):

Courses unique to this alternative:

COURSE TITLE/NUMBER	Number of Credits	EXISTING COURSE/S	
		Yes	No

*Change in Curriculum Alternative/s: If you are adding multiple alternatives to a single program, please identify each separately and list courses separately by copying and pasting this section as many times as necessary.

Section IIF: DELETE EXISTING CURRICULUM ALTERNATIVE/S*

Name of Alternative: _____ CIP: _____

*Delete Curriculum Alternative/s: If you are deleting multiple alternatives, identify each separately. Add additional lines as necessary.

Section IIG: AWARD CHANGE

Current Award: _____ Proposed Award: _____

List courses for both current award and proposed award

CURRENT AWARD:	COURSE TITLE/NUMBER	Number of Credits	EXISTING COURSE/S	
			Yes	No
PROPOSED AWARD:	COURSE TITLE/NUMBER	Number of Credits	EXISTING COURSE/S	
			Yes	No

Section III: CREATE NEW AWARD IN RELATED ACADEMIC AREA

Name:	6-digit CIP:	Total Credits:		
Please list all courses for the new award below:		Award:		
COURSE TITLE/NUMBER	Number of Credits	EXISTING COURSE/S		
		Yes	No	

*Creating new awards in related academic areas: Before completing this section, contact Academic Program staff to verify that you can make these proposed changes as redesigns. If you are adding awards in multiple related areas, identify each

separately
and list courses separately by replicating this table.

SECTION III: REDESIGNED PROGRAM SUMMARY

Program Requirements:

Complete this section if the number of credits in the award has increased from the previous design, or if it is a new award.

Use the following headings to provide information on **each** of the components in the program. List all credit totals required for the students to graduate, including prerequisites. If this application is for multiple awards (AAS and/or diplomas and/or certificates) duplicate this table and list requirements for each award separately.

Program Name: Electronic Engineering Technology		Award: Bachelor of Science
Program Component	Previous Credits	Proposed Credits
General Education/Liberal Studies Eng, Gen Stud (Note 4 additional Gen Ed credits exist in required EET courses)	34	26
Prerequisites Math, Chem, Phy, Sci	27	27
Major-Core	61	64
Major-Alternative (see above)		
Major-Restricted Electives	6	11
Required Minor (or est. 20 credits)		
Free Electives		
TOTAL PROGRAM CREDITS	128	128

SECTION IV: APPROVAL VERIFICATION

Application Author: William B Hudson

Title: Professor and Chair Electrical and Computer Engineering and Technology Department

Campus: Minnesota State University, Mankato

Phone and E-Mail: 507-389-5639 william.hudson@mnsu.edu

Approval Chief Academic Officer:

Approval of President:

Signature of cooperating institution's president for joint awards:

SECTION V: APPENDICES/SUPPORTING DOCUMENTATION

- A. Institution Curriculum Committee Membership and Minutes showing recommendations (required)
- B. Occupational/Professional Demand Data (required, if adding a certificate or AAS to an AS).
- C. Copies of Agreements with Institutions (Joint and Articulated degrees) (required, if applicable)
- D. Justification for Exceeding Program Credit Lengths set in Policy (required, if applicable)
- E. Evidence of business/industry support (required for occupational programs, optional for others)
- F. Letters of Support (optional)

College of Science, Engineering and Technology
Curriculum Committee Meeting Minutes
TR E210, Thursday, March 8, 2007

Present: Harry Petersen (AMET), Gregg Marg (Biology for Beth Lavoie), Jim Rife (Chemistry/Geology), Gregg Asher (CIS), Julio Mandojana (ECET), Dan Singer (Math/Statistics), Karen Chou (ME/CivE), Youwen Xu (Physics/Astronomy), Mahbubur Syed (UCAP Representative for CSET).

1. The meeting was called to order at 5:05 PM.
2. The minutes of 10-31-2006 meeting were approved as written.
3. Karen Chou reported that the proposals which were approved by the Committee and have all required documents have been moved forward to UCAP. However, although proposals 734 and 717 were approved by the Committee, when they reached UCAP the signature pages were missing. Karen will sign the proposals and return them back to UCAP.
4. Karen Chou summarized the proposals that will be reviewed in this meeting.
5. The Committee reviewed and approved 28 proposals.
6. Proposals 711, 712, 748, 749 have been resubmitted and renumbered to 7269, 7270, 7271 and 7272, and the Committee approved the later ones.

Meeting adjourned at 5:55 PM.

Respectfully submitted,

Youwen Xu, Secretary

Electronic Engineering Technology

College of Science, Engineering & Technology

Department of Electrical & Computer Engineering and Technology

137 Trafton Science Center S • 507-389-5747

Web site: www.cset.mnsu.edu/ecst

Chair: Bill Hudson, Ph.D.

Program Coordinator: Gale Allen, Ph.D.

Mark Dvorak, Ph.D.; Tom Hendrickson, Ph.D.; Han-Way Huang, Ph.D.; Bill Hudson, Ph.D.; Rajiv Kapadia, Ph.D.; Muhammad Khaliq, Ph.D.; Paul Lindfors, Ph.D.; Julio Mandojana, Ph.D.; Ramakrishna Nair, Ph.D.; Vincent Winstead, P.E., Ph.D.; Qun Zhang, Ph.D.

Electronic Engineering Technology is a technological field requiring the application of scientific and engineering knowledge and methods, combined with technical skills, in support of engineering activities. An electronic engineering technologist is a person who is knowledgeable in electronics theory and design and who understands state-of-the-art practices in digital and analog circuits and systems. Computers, controls/ automation, robotics, instrumentation, and communications are just a few fields open to engineering technologists.

Overall the program strives to prepare students for entry into the technical workforce with well-developed skills. In particular, the department strives to ensure that its graduates have an ability to:

1. Apply knowledge of science, mathematics, and engineering
2. Design, and conduct experiments as well as analyze and interpret data
3. Design a system, component, or process to meet specified needs
4. Function effectively in teams
5. Identify, formulate, and solve engineering problems
6. Have an understanding of professional and ethical responsibilities
7. Communicate effectively

The Educational Objectives for our Bachelors Degree in Electronic Engineering Technology program area:

1. Function as responsible members of society with an awareness of the social, ethical, and economic ramifications of their work.
2. Become successful practitioners in electronic engineering technology and other diverse careers.
- ~~3. Succeed in full-time graduate and professional studies.~~
3. Pursue continuing and life-long learning opportunities.
4. Provide necessary skills to advance technically and/or managerially
5. Provide foundational education that allows for personal growth and flexibility through their career.

Our metrics for determining success in meeting these objectives will include:

1. Assessment of societal, economic awareness, and ethical performance of our graduates by the graduate and employer.
2. Monitoring of the success of our graduates in the work force.
3. Assessment of continuing and life-long learning by the graduate (and their employer as applicable).
4. Ongoing contact with graduates to determine career paths and challenges confronted.

This program is accredited by the Technology Accreditation Commission (TAC) of the Accreditation Board for Engineering and Technology (ABET).

Accreditation. The Electronic Engineering Technology program is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET), 111 Market Place, Suite 1050, Baltimore, MD 21202-4012, Telephone: 410-347-7700.

Admission to Major is granted by the department. Minimum program admission requirements are:

- a minimum of 32 earned semester credit hours.
- a minimum cumulative GPA of 2.00 ("C").

Contact the department for application procedures.

ELECTRONIC ENGINEERING TECHNOLOGY BS

Students who do not have the required background for MATH 115 may have to take additional preparatory coursework as well. Consult with your major advisor to plan your general education and major requirements.

All students must complete a minimum of 12 semester credits of mathematics starting with Precalculus math and a minimum of 24 semester credits of combined mathematics and science courses.

Required General Education (15 credits):

ENG 101 Composition (4)

SPEE 102 Public Speaking (3)
MATH 115 Precalculus Mathematics (4)
PHYS 211 Principles of Physics I (4)

Required Support Courses (7 credits):

MATH 121 Calculus I (4)
MET 427 Quality Management Systems (3)

Choose one of the following:

~~COMS 230 Intelligent Systems (4)~~
~~COMS 271 C++ Programming (4)~~
~~COMS 380 Systems Analysis and Design (4)~~

Required for Major (Communication, Mathematics and Science, 12 credits):

~~ENG 271 Technical Communication (4)~~
MATH 127 Calculus II for Engineering Technology: Integration (2)
PHYS 212 Principles of Physics II (4)
CHEM 104 Introduction to Chemistry (3)

Choose one of the following:

STAT 154 Elementary Statistics (3)
MATH 354 Concepts of Probability and Statistics (3)

Required Core for Major (EET, 75 credits):

EET 113 DC Circuits (3)
EET 114 AC Circuits (3)
EET 141 Integrated Computer Technology I (4)
EET 142 Integrated Computer Technology II (4)
EET 143 Integrated Computer Technology III (4)
EET 221 Electronic CAD (3)
EET 222 Electronics I (4)
EET 223 Electronics II (4)
EET 241 Electronic Shop Practices (2)
EET 254 Microprocessors I (4)
EET 340 Programmable Hardware Technology (4)
EET 355 Electrical Power Systems (3)
~~EET 400 Network Analysis (3)~~
EET 452 Operational Amplifier Applications (3)
~~EET 454 Microprocessors I (4)~~
EET 456 Communications I (4)
~~EET 458 Advanced Instrumentation (1)~~
EET 461 Industrial Automation I (4)
EET 462 Industrial Automation II (4)
EET 484 Microprocessors II (4)
EET 497* Internship (3)

Choose a minimum of 11 credits from the following courses:

EET 425 EET430 EET 455 ~~EET 484~~ EET 486 EET 487 EET 492

* You may substitute one EET advanced elective for internship.

Required Minor: None.

ELECTRONIC ENGINEERING TECHNOLOGY MINOR

Required for Minor (Core, 13 credits):

EET 112 Elementary Electronics (3)
EET 113 DC Circuits (3)
EET 114 AC Circuits (3)
EET 222 Electronics I (4)

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

DIGITAL OPTION

~~EET 225 Digital Principles (3)~~
EET 141 Integrated Computer Technology I (4)
EET 454 Microprocessors I (4)

ELECTRONICS OPTION

EET 223 Electronics II (4)

Choose one of the following:

EET 452 Operational Amplifier Applications (3)
EET 455 Advanced Power Electronics (3)
EET 492 Integrated Circuit Technology (4)

NETWORKING OPTION

~~EET 230 Microcomputer Technology (4)~~
EET 430 Computer Networking I (4)
EET 454 Microprocessors I (4)

COMMUNICATIONS OPTION

EET 223 Electronics II (4)
EET 456 Communications I (4)

POWER OPTION

EET 223 Electronics II (4)
EET 355 Electrical Power Systems (3)

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 Minnesota State Mankato EET coursework; and 3) have completed their senior design sequence at Minnesota State Mankato.

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 Minnesota State Mankato 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, EET 113 and EET 114. The student may also attempt to test out of EET 114, EET 222, ~~EET 225~~ and EET 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.

Petition to evaluate transfer credits must occur no later than the first semester the student is enrolled in or declared a major housed in the Department of Electrical and Computer Engineering Technology.

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 Minnesota State Mankato or for any EET course above EET 223.

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.~~

~~Fall~~

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.

Fall, Spring

GE-3

EET 113 (3) 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

Fall, Spring

EET 114 (3) AC Circuits

A study of AC circuits, power, phasors, series and parallel AC networks, and network analysis theorems. Ohm's Laws and Kirchhoff's Laws for AC circuits. Use of dependent sources in AC circuits.

Pre: EET 113 and MATH 115

Fall, Spring

EET 115 (3) Understanding Computers

A self-paced, interactive, multi-media course, for nonengineering students, exploring the basics of computer hardware. The course will cover concepts behind computer design and operation, including issues such as the need for RAM, hard drive, memory, ROM, etc.

Fall, Spring

GE-13

EET 116 (3) Communications-Past, Present & Future

This is an introductory course in the use of technology for communication. During the semester students will study the evolution of communications technology from early days to the present. This course will cover wireless, analog, and digital techniques including telephony, the internet, and mobile formats. The student will study theory and principles involved in the different types of communications. Modern techniques in digital communications will be discussed and demonstrated through simulation. A consumer example of digital communication will be given.

Variable

GE-13

EET 117 (3) Introduction to Digital Electronics

Hands-on experiences in the use of digital integrated circuits and logic families. Students will study logic gates, number systems, flip flops, latches, registers, computer arithmetic and memory. A self paced format with an open laboratory format.

Variable

EET 125 (3) Perspective on Technology

Historical, cultural, ethical, philosophical, developmental, and creative aspects of engineering and technology as a discipline are explored. The course also examines concepts and events leading to important innovations of recent times; microwave ovens, FAX machines, personal computers, traffic signals, and video games. Available for general education and cultural diversity offered as self-paced on line format.

Fall

GE-6, 8 CD-Related

EET 141 (4) Integrated Computer Technology I

Digital circuit, logic, and C programming skills needed for electronic and computer engineering technology. Covers binary arithmetic, clock distribution, timing, TTL, CMOS, logic gates, Boolean algebra, multiplexer, counter, adder, logic simulation, C language elements, C programming techniques and use of digital test equipment. Students design and build an Arithmetic Logic Unit (ALU) from small-scale logic components and simulate each block in C.

Co: EET 113

Fall

EET 142 (4) Integrated Computer Technology II

Continues building digital circuit, logic, and C programming skills needed for electronic and computer engineering technology. Covers comparators, decoding, encoding, multiplexers, flip-flops, Schmitt Trigger, C functions, arrays, variables, recursive functions, structures, and strings. Students design, build and test a microprocessor using TTL gates and simulate each block in C.

Pre: EET 141

Spring

EET 143 (4) Integrated Computer Technology III

Sequential circuits, logic timing, clock distribution, counter, LED display, shift register, transceiver, 555 timer, 555 oscillator, D/A converter, RAM, ROM, mass memory, synchronous logic, asynchronous logic, microprocessor-interfacing, testability, and simulation.

Pre: EET 142

Fall

EET 221 (3) Electronic CAD

Drafting principles involving use of computer electronic CAD software in laying out block diagrams, schematic diagrams, production drawings, graphical presentation of data, and printed circuit board layout and construction.

Fall

EET 222 (4) Electronics I

An introduction to semiconductor theory and circuits: includes characteristics curves, biasing techniques and small signal analysis of FETs and MOSFETs, feedback concept, BJT and FETs frequency response.

Pre: EET 114 or concurrent

Fall

EET 223 (4) Electronics II

An introduction to differential amplifier, linear and nonlinear operational amplifiers, power amplifiers, linear digital ICs, oscillators, power supplies, D/A, A/D conversion, four layered devices and their applications.

Pre: EET 222

Spring

EET 225 (3) Digital Principles

A study of number systems, Boolean algebra, switching function minimization techniques, binary arithmetic, small scale and medium scale logic chips, programmable logic devices, latches, flip-flops, registers and counters, and sequential circuit design.

Spring

EET 230 (4) Microcomputer Technology

An introduction to the installation, configuration, upgrading, troubleshooting and repair of microcomputers. Basic knowledge of desktop systems, basic networking concepts and printers will be introduced. Safety and common preventive maintenance procedures will be covered.

Pre: EET 113 or permission of instructor

Spring

EET 241 (2) Electronic Shop Practices

An introduction to tools, equipment, materials, and techniques used in fabrication of electronic projects and printed circuit boards.

Pre: EET 222 and EET 221

Spring

EET 254 (4) Microprocessors I

(Add course description.)

EET 298 (1-4) Topics

Varied topics in Electronic and Computer Engineering Technology. May be repeated as topics change.

Prerequisite: to be determined by course topic

EET 340 (4) Programmable Hardware Technology

(Add course description.)

EET 355 (3) Electrical Power Systems

Electrical power and magnetic circuit concepts, transformers, generators and motors (DC, synchronous, induction), special purpose motors, power-electronic motor drivers, prime movers/alternatives, generation, transmission/distribution, system stability/protection.

Pre: EET 114

Fall

EET 393 (1-4) Practicum

Elective credit for approved experience in off-campus work related to EET major.

Permission required.

Fall, Spring

EET 400 (3) Network Analysis

A course in network analysis that stresses time, frequency and Laplace transform domain techniques.

Pre: EET 114 and MATH 127

Spring

EET 425 (3) Advanced Digital Design

A study of multiple-output switching functions optimization, flip-flops, registers and counters, programmable logic devices, synchronous sequential circuit design and synthesis, pulse mode and fundamental model sequential circuit design, test methods, and test vector generation.

Pre: EET 225

Variable

EET 430 (4) Computer Networking I

An introduction to the basic foundations of computer networking. The course will encompass telecommunications, local area networks, wide area networks and wireless communication. Topics covered include OSI model, the TCP/IP MODEL, different network topologies and associated hardware, error detection and correction, protocols, and security.

Pre: EET 230 and COMS 112 or consent of instructor.

Fall

EET 431 (4) Computer Networking II

A continuation of EET 430. Router configurations, advanced LAN topologies, network configurations, protocols, and switching designs. Network troubleshooting and threaded case studies.

Pre: EET 430

Spring

EET 441 (4) Embedded Systems - Proposal # 325

EET 452 (3) Operational Amplifier Applications

Operational amplifier circuits utilized in filters, sensors, comparators, voltage regulators, device testing, measurement systems, multipliers, phase-locked loops, and A/D converters. Differential amplifier basics. Linear integrated circuit processing.

Pre: EET 223 and MATH 121

Fall

~~EET 454 (4) Microprocessors I~~

~~A study of microcomputer hardware and software fundamentals, the instruction set and the addressing modes of a microprocessor/microcontroller, assembly programming, basic I/O concepts, parallel I/O methods, asynchronous serial I/O methods, synchronous serial I/O methods, A/D conversion, and timer applications.~~

~~Pre: EET 225~~

~~Spring~~

EET 455 (3) Advanced Power Electronics

The half-wave rectifier with power loads, power semiconductor switches, thyristor states, controlled rectifiers, commutating circuits, AC voltage controllers (poly and single phase), motor controllers, DC-DC converters, and inverters.

Pre: EET 223 and EET355

Variable

EET 456 (4) Communications I

Communications principles and systems. Practical engineering aspects involved in modulation-demodulation, receivers, transmitters and filters. Also included are radiation and antennas, guided waves, microwaves, and microwave systems.

Pre: EET 222 or Consent

Spring

EET 458 (1) Advanced Instrumentation

Experiences with electronic equipment and instrumentation including maintenance, repair, calibration, safety and component identification.

Pre: 25 hours of EET courses, or consent

Spring

EET 461 (4) Industrial Automation I

Automation components and subsystems involving sensors, transistors, logic, amplifiers, software, microprocessors, PLCs, actuators, encoders, stages, motors, controllers, and drives. Students design, simulate, build, test and document automation systems for Capstone projects.

Pre: EET 222 and EET 454

Fall

EET 462 (4) Industrial Automation II

Continues building skills in automation components and subsystems involving sensors, transistors, logic, amplifiers, software, microprocessors, PLCs, actuators, encoders, stages, motors, controllers and drives. Students design, simulate, build, test and document automation systems for Capstone projects.

Pre: EET 461

Spring

~~EET 480 (3) Automatic Controls~~

~~Servomechanism analysis under transient and steady state conditions. Negative and positive feedback. Laplace transform analysis of feedback systems. Frequency response. System stability analysis using Bode plots and Root locus. Lead/lag and velocity compensation. Analog computers. Microprocessor control and the analog/digital interface.~~

~~Pre: EET 400~~

~~Fall~~

EET 484 (4) Microprocessors II

A study of a high performance microprocessor architecture. Applications of a microprocessor for monitoring and controlling systems will be studied. Optimal utilization of a microprocessors resources will be stressed. PC programming in assembly and a high level language.

Pre: EET 454 or consent of instructor

Fall

EET 486 (3) Communications II

An overview of a communication system. Phase Shift Keying, Amplitude Shift Keying and Frequency Shift Keying. Coherent and non-coherent detection. Maximum likelihood receiver and Matched filter. Noise power, Noise figure, and Noise Temperature. Error performance in presence of noise. Linear block codes, cyclic codes and convolution codes. Spread Spectrum Techniques.

Pre: EET 456

Variable

EET 487 (3) RF Systems Technology

Overview of wireless communication and control systems. Characterization and measurement of RF networks. Transmission lines. Antennas. Radio wave propagation. Fading. Smith Chart. RF transistor amplifiers, oscillators and mixer/modulator circuits. Klystrons, magnetrons and TWTs. Spread spectrum techniques. SAW matched filters.

Pre: EET 456

Variable

~~EET 488 (1) Senior Project Design I~~

~~A group design project performed in consultation with the instructor. Phase I includes the acceptance of the proposal, defining, and limiting the project objectives, initial source contacts and procurement of materials.~~

~~Pre: EET 241, four 400-level EET courses or Consent of Instructor~~

~~Fall, Spring~~

~~EET 489 (2) Senior Project Design II~~

~~Phase II includes completion of the project with evidence of extensive laboratory performance. A final oral report to the class and a standard formal written report are required.~~

~~Pre: EET 488~~

~~Fall, Spring~~

EET 491 (1-4) In-Service

EET 492 (4) Integrated Circuit Technology

Semiconductor industry and overview of integrated circuit manufacturing, integrated circuit types, crystal growth and wafer manufacturing, physics of semiconductor materials, detail of major IC fabrication steps, process yield, semiconductor devices and integrated circuit formation, packaging, and semiconductor measurements, introduction to layout tools.

Pre: EET 223

Spring

EET 497 (1-6) Internship

Should be taken at end of junior year.

Permission required. Pre: 40 hrs EET credits or written permission from program coordinator.

Fall, Spring

EET 498 (1-4) Topics

Varied topics in Electronic and Computer Engineering Technology. May be repeated as topics change.

Prerequisite: to be determined by course topic

EET 499 (1-4) Individual Study

Fall, Spring