0665

Minnesota State University, Mankato HOLD and CLEAR buttons only compatible with Acrobat V. 4 and 5

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 ☐ Undergraduate

Department: Electrical and Computer Engineering and T ☐ Graduate

Program: CIP # _____

Type of Change Proposed: COURSE PROPOSALS — New Course

Title Current:

Title Proposed: Integrated Computer Technology II

24-Char. Abbrev: Integrated Comp Tech II

Proposal # 253

Effective Date of Change:

Academic Year 05-06

(For Office Use Only)

Course Designator and Number	Number of Credits
EET 142	4

(if applicable)

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

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.

Rationale or Justification for change:

The course strengthens the digital content of the EET and CET programs. It focuses on developing skills needed for use of existing hardware and software technology in engineering as compared with development of hardware components and software tools. It integrates digital hardware and software training. The proposed course was strongly endorsed by the ECET Industry Advisory Board at the Fall 2005 meeting.

For General Education or Cultural Diversity Courses Only

General Education Course:

GE Category # **GE Category Name (Maximum of 3 Categories)**

N/A

N/A

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.

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.)

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.

For New Courses

(Check all that apply:)

☐ Course is an elective.

☒ Course is required for program: EET and CET

☒ Pre- or Co-requisites: Pre: EET 141

☒ Other courses are being changed or eliminated. (Explain.) EET 101 and EET 225 outcomes will be covered by this course.

Instructional Type: Lecture/Lab

Grading Format: ☒ Grade ☐ P/N

Course will be offered:

☐ Fall Semester

☒ Spring Semester

☐ Summer Session

☐ 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.

Minnesota State University, Mankato

Curriculum Proposal

Signature Page

Department

X Recommended (Category/ies_____)
__Not Recommended (Category/ies_____)

W. B. Hud — Department Chair — 4-6-06 — Date

Comments:

College Curriculum Committee

X Recommended (Category/ies_____)
__Not Recommended (Category/ies_____)

Committee Chair — 4-6-06 — Date

Comments:

College Dean

✓ Recommended (Category/ies_____)
__Not Recommended (Category/ies_____)

Dean — 4/10/06 — 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_____)

UCAP Faculty Chair — 5/11/06 — 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_____)

Assistant Vice President — 5/17/06 — Date

Comments:

Senior Vice President and Vice President for Academic Affairs

✓ Approved (Category/ies_____)
__Not Approved (Category/ies_____)

Sr. Vice President / Vice Pres. Academic Affairs — 5/17/06 — Date

Comments:

Minnesota State University, Mankato

Curriculum Proposal

*****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/acadaf/pra/forms/

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:
http://www.mnsu.edu/acadaf/Curriculum/currformsprocess.html

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.

EET 142 Integrated Computer Technology II (4 credits)
Course Proposal
Outline

Class Schedule: 3 lectures, 1 2-hour lab

Description: Continues building digital circuit, logic, and C programming skills needed for electronic and computer engineering. 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

Texts:
Digital Electronics: A Practical Approach, 7/E. William Kleitz. ISBN: 0-13-114165. Prentice Hall, Copyright: 2005.
Programming in C, 3/E, Stephen Kochan, ISBN: 0-672-32666-3. Sams, Copyright: 2005

Plan:

- Comparators, decoding, and encoding
- Code-converters, multiplexers and demultiplexers in logic circuits
- C functions and arrays
- C global variables, automatic variables and static variables
- Simulate logic in C
- Interface TTL and CMOS logic
- S-R Flip-Flops, D Flip-Flops, D Latches, and J-K Flip-Flops
- Determine Flip-Flop Time timing
- C recursive functions and structures
- C variable-length character strings, escape characters, constant strings, and character strings
- Returning function results and top-down programming
- Automatic reset logic, Schmitt Trigger, debounce circuits, and pull-up resistors
- Microcontroller – work on in parallel with the above topics
    - Microprocessor logic circuit design using individual TTL gates
    - Microprocessor test plan & documentation requirements
    - Microprocessor ORCAD simulation
    - Microprocessor C simulation

Laboratory:
Weekly labs will support the lecture plan and develop the microprocessor.

EET 142 Integrated Computer Technology II
Course Proposal
Outcomes

After completing Integrated Computer Technology II (EET 142) the student will be able to:

1. Use Comparators, Decoding, and Encoding in logic circuits.
2. Use Code-Converters, Multiplexers and Demultiplexers in logic circuits.
3. Interface TTL and CMOS logic.
4. Use S-R Flip-Flops, D Flip-Flops, D Latches, and J-K Flip-Flops.
5. Determine Flip-Flop Time timing.
6. Use Automatic Reset logic.
7. Use Schmitt Trigger ICs.
8. Use Debounce circuits.
9. Size Pull-Up Resistors.
10. Returning Function Results.
11. Perform Top-Down Programming.
12. Write C code using Functions and Arrays, Global Variables, Automatic Variables and Static Variables.
13. Write C code using Recursive Functions and Structures.
14. Write C code using Variable-Length Character Strings, Escape Characters, Constant Strings, and Character Strings.
15. Design and build a microprocessor using individual TTL gates.
16. Simulate the microprocessor at the gate-level using a tool such as ORCAD.
17. Simulate the microprocessor in C.
18. Test the microprocessor with an oscilloscope.
19. Test the microprocessor with a logic analyzer.

EET 142 Integrated Computer Technology II
Course Proposal
Staff Impact and Resource Needs

Staff Impact – a new ECET faculty is starting in Fall 06 and will teach the course.

Resource Needs – no additional resources are needed. Equipment exists in current labs.

Minutes
ECET Faculty Staff Meeting
March 20, 2006

Attending: G. Allen, R. Bates, J.Caven, M. Dvorak, T. Hendrickson, H. Huang, B. Hudson, R. Kapadia, M. Khaliq, P. Lindfors and M. Syed.

Good News – Gale Allen discussed the paper that he will be presenting, Bill Hudson provided brief overview of ECEDHA Department Heads Meeting

Center of Excellence Proposals – Faculty were thanked for their involvement in proposal preparation for the Center of Excellence. The department received multiple awards including new instrumentation for the electronics lab and funds to support equipping a automation laboratory.

Professor Hudson provided a brief update on Vince Winstead – it appears that he will be joining us but it is not yet confirmed.

Professor Hudson brought forth the issue regarding the Minnesota State Boards decision to not allow our Computer Engineering students to sit for the FE exam. Brief discussion about possible options. Professor Hudson will gather additional information and this will be discussed at a future meeting. Much of this is complicated by issues in the CIS department

Professor Hudson informed faculty that he would be in Texas Monday and Tuesday of next week assisting with ABET issues – as such no ECET faculty meeting next week

Professor Allen presented a proposal to move forward with the changes for the EET and CET program shown in the attached materials. After brief discussion Tom Hendrickson moved and Paul Lindfors seconded that we move forward with the proposed changes. Motion passed.

Respectfully submitted: Bill Hudson

ECET Course Advising
COMPUTER ENGINEERING TECHNOLOGY
Program revisions
shown contrasted with 2005-2006 program

Freshman (FALL)	Credits
~~COMS 110 Intro to Comp Sci~~	4
EET 113 DC Circuits	
ENG 101 English Comp	
MATH 115 Pre-Calculus	
General Education _____	
EET 101 Intro to EET/CET (Not Required)	
EET 141 Integ Comp Tech I	***4***

Freshman (SPRING)	Credits
~~COMS 211 Fund of Comp Science I~~	4
EET 114 AC Circuits	
MATH 121 Calculus I	
SPEE 102 Public Speaking	
General Education _____	
EET 142 Integ Comp Tech II	***4***

Sophomore(FALL)	Credits
~~COMS 212 Fun of Comp SciII~~	4
EET 221 Electronic CAD	
EET 222 Electronics I	
PHYS 211 Prin of Physics I	
MATH 127 Calc II for ET	
EET 143 Integ Comp Tech III	***4***

Sophomore(SPRING)	Credits
EET 223 Electronics II	
~~EET 225 Digital Principles~~	3
EET 241 Elec. Shop Practice	
PHYS 212 Principles of Physics II	
General Education _____	

Junior(FALL)	Credits
~~COMS 380 Sys Ana & Des~~	4
ENG 271 Tech Comm	
MATH 180 Math Comp Sci	
General Education _____	

Junior(SPRING)	Credits
EET 400 Network Analysis	
EET 454 Microprocessors I	
EET 456 Communications I	
General Education _____	

Senior(FALL)	Credits
~~EET 480 Auto Controls~~	3
EET 484 Microprocessors II	
~~EET 488 Senior Design I~~	1
General Education _____	
EET 497 Internship**	
EET Technical Elective *	
EET 461 Industrial Automation I	***4***

Senior(SPRING)	Credits
~~COMS 340 Database Mgmt Systems I~~	4
~~EET 489 Senior Design II~~	2
STAT 154 Elementary Statistics	
OR MATH 354 Con. Of Prob&Stat (3)	
OR CHEM 104 Intro to Chemistry (3)	
General Education _____	
EET Technical Elective *	
EET 462 Industrial Automation II	***4***

* 9 hours of technical electives approved by Technology Coordinator

The proposal calls for dropping 20 credits of CIS coursework and 9 credits of EET coursework. 20 credits of new EET coursework has been added and students will be required to complete 9 hours of technical electives. The net credit hour change is zero.

ELECTRONIC ENGINEERING TECHNOLOGY
Program revisions - shown contrasted with 2005-2006 program

Freshman (FALL)	Credits
~~COMS 110 Intro to Comp Sci~~	4
EET 113 DC Circuits	
ENG 101 English Comp	
MATH 115 Pre-Calculus	
General Education	
~~EET 101 Intro to EET/CET (Not Required)~~	
EET 141 Integ Comp Tech I	***4***

Freshman (SPRING)	Credits
~~COMS 211 Fund of Comp Science I~~	4
EET 114 AC Circuits	
MATH 121 Calculus I	
SPEE 102 Public Speaking	
General Education	
EET 142 Integ Comp Tech II	***4***

Sophomore(FALL)	Credits
~~COMS 212 Fun of Comp SciII~~	4
EET 221 Electronic CAD	
EET 222 Electronics I	
PHYS 211 Prin of Physics I	
MATH 127 Calc II for ET	

Sophomore(SPRING)	Credits
EET 223 Electronics II	
~~EET *225* Digital Principles~~	3
EET 241 Elec. Shop Practice	
PHYS 212 Principles of Physics II	
General Education	

Junior(FALL)	Credits
CHEM 104 Intro to Chem	
EET 355 Elecl Power Sys	
EET 452 Op Amp App	
ENG 271 Tech Comm	
General Education	

Junior(SPRING)	Credits
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	

Senior(FALL)	Credits
EET Technical Elective*	
~~EET 480 Automatic Controls~~	3
~~EET 488 Sen Proj Design I~~	1
MET 427 Quality Assurance	
General Education	
EET 497 Internship**	
EET 461 Industrial Automation I	***4***

Senior(SPRING)	Credits
EET Technical Elective*	
~~EET 489 Senior Project Design II~~	2
General Education	
General Education	
EET 462 Industrial Automation II	***4***

* 11 hours of technical electives approved by Technology Coordinator

- Current program has 6 credits of advances electives. Revised program will have 11 credits of technical electives
- A total of 21 credits have been dropped. 16 credits of new courses have been added, and with the increase of 5 credits of technical electives the net change is zero.

MINNESOTA STATE UNIVERSITY
MANKATO

INTEROFFICE MEMORANDUM

TO: CSET COURSE AND CURRICULUM COMMITTEE

FROM: WILLIAM B HUDSON, CHAIR ECET DEPARTMENT

SUBJECT: PROPOSED COURSE CONTENT

DATE: 4/3/2006

CC: [CLICK **HERE** AND TYPE NAME]

The new course proposals list desired student course outcomes. These outcomes or student competencies are skills that a student will have as they successfully complete the course. It is the responsibility of the instructor to establish teaching strategies to accomplish these outcomes. The techniques and time devoted to each concept is thought to be an issue of academic freedom by the department and as such the department is reluctant to assign percentages of lecture time to each topic.

The courses proposed follow the guidance of the department's Industrial Advisory Board as to content. Our Industrial Advisory Board feels strongly that department courses need to emphasize hardware and applications of hardware. As such all of the courses being proposed will have very brief amounts of time devoted to programming – these proposals are in no way an effort to create programming focused courses.

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING AND TECHNOLOGY
137 TRAFTON SCIENCE CENTER S · MANKATO, MN 56001
PHONE 507-389-5747 (V) · 800-627-3529 OR 711 (MRS/TTY) · FAX 507-389-6280