



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

0750

Sent to Gen Ed
NOT Recommended
 By Gen Ed.

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: EET and CET Programs CIP # _____
 Type of Change: GEN. ED./CULTURAL DIVERSITY PROPOSALS
 Proposed: New General Education Course

Title Current: Integrated Computer Technology I
 Title Proposed: Integrated Computer Technology I
 24-Char. Abbrev: Integrated Comp Tech I

Proposal #: 150
 Effective Date of Change: _____
 Academic Year: 06-07
 (For Office Use Only)

Course Designator and Number	Number of Credits
EET 141	4
EET 141	4

(if applicable)

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

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.
 Pre: Math 112

Rationale or Justification for change:

This course which was approved in Spring 2006 provides extensive training in Information Technology and therefore is submitted to be considered for inclusion in that General Education category.

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.)
13	Information Technology	<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 checked="" 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/Lab
 Course is an elective.
 Course is required for program
 Pre- or Co-requisites:
 Other courses are being changed or eliminated. (Explain.) _____

Grading Format: Grade P/N
EET and CET
Pre: Math 112

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:

- 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 _____)

Will B. Hudson
 Department Chair

10-30-06
 Date

Comments:

College Curriculum Committee

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

Karen C. Chou
 Committee Chair

11/6/06
 Date

Comments:

College Dean

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

John D. [Signature]
 Dean

11/6/06
 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 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 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 Date

Comments:

Syllabus for EET 298 (141) – Fall (2006-2007)

Course Title: Integrated Computer Technology I

Course Description: This course provides an introduction to digital circuit components, digital logic and C language programming sufficient to enable integration of digital devices and simulation of digital logic. The course covers binary arithmetic, logic timing, TTL and CMOS logic gates, Boolean algebra, adders and C language programming sufficient to simulate digital logic.

Prerequisite: Math 112

Recommended Texts:

Kleitz, W (2005), *Digital Electronics: A Practical Approach*, 7/E, Prentice Hall
Kochan, S. (2005), *Programming in C*, 3/E, Sams Publishing

Class Lecture Time: MWF 1400-1450

Class Lecture Location: WH 0286 (Wissink Hall)

Class Laboratory Time: T 1300-1450

Class Laboratory Location: TR C100 (Trafton), move to another lab TBD

Instructor: Dr. Vincent Winstead

Office: Trafton South C112

Phone: (507) 389-5456

Email: vincent.winstead@mnsu.edu

Office Hours: MTF 0800-1000, MT 1500-1600, Other times by appointment only!

Course Resources: Instructor Webpage (<https://mavdisk.mnsu.edu/winstv/>)

- Homework Assignments
- Homework Solutions
- Lecture and Lab scheduling and other information updates
- Links to related information and additional background material

Grading: Midterm 1 – 25%
Midterm 2 – 25%
Final – 25%
Homework – 10%
Lab Reports – 15%

It is expected that the traditional 90, 80, 70 grading curve will be used for this class with one notable exception. Attendance at all lectures and laboratories is Mandatory – Not Attending this class will result in a failing grade – YOU ARE REQUIRED TO BE IN

ATTENDANCE! Late assignments and reports will not be accepted and will result in a zero score. Lowest score from all homework assignments will be dropped for final grade.

You must be registered for the course to receive credit.

Please note: Assignments in this class will be both group and individual. In all cases when a group assignment is submitted each individual's effort on the assignment must be shown. Techniques for doing this will be discussed in class – if you are unsure ask!!

Laboratory Report Format will include (at a minimum):

1. Title Page containing experiment number, experiment title, date of lab, due date of report and printed names of the group members
2. Summarized description of experiment described in complete sentences. Use paragraphs and not bullets.
3. Description of at least two components or test equipment items used during the experiment and how they were used.
4. Completed pages from the lab manual for the experiment including the questions at the end. *The instructor or teaching assistant may hand out additional experiment questions to be completed and included in the report.*

Cheating: Cheating will be dealt with in a manner that is consistent with the action. The severity of the penalty may be a simple reprimand or may result in failure of the course. The goal is for you to learn the material. If you are experiencing trouble in the course discuss it with the instructor – learning the material is easier and far more satisfying than cheating.

Documentation: It is expected that assignments and reports for this course will be prepared in a manner that would be acceptable in the work environment.

ADA: It is the intent of the instructor of this course to provide a learning environment that is as conducive to learning and the expression of abilities as is possible. If any student in this course has any condition that requires special accommodation to allow them to master or demonstrate mastery of concepts they are asked to contact the instructor as soon as possible.

Participation: Conduct consistent with ethical and supportive business practices will be expected. In paraphrasing the Sprint Code of Conduct – be on time for meetings – be prepared for meetings – do not interrupt – criticize ideas not people – respect each other – provide solutions not just problems. Please do not use computers or other electronics during class when they are not required – it is rude and inappropriate.

Incompletes: Incompletes are given for circumstances beyond a student's control. I don't interpret this to cover poor planning.

Course Outline

<u>Topics</u>	<u>Lectures</u>
Binary and Hexadecimal Arithmetic	3
Switch-Level Transistor Model	3
Logic Gates	5
C Variables, Data and Constants	3
C Arithmetic Expressions and Assignment Operators	4
C Simulation of Logic Gates	4
TTL and CMOS Logic Circuits, Clocking and Timing	2
Boolean Algebra and Reduction Techniques	10
Exclusive Logic Gates	3
Two's-Complement and Arithmetic Circuits	3
Introduction to ORCAD	2

Course Laboratory Outline

<u>Topics</u>	<u>Lab Number</u>
Laboratory Equipment Familiarization and Safety	1
Introduction to Logic Test Equipment	2
Equipment and Components	3
AND/OR Gates	4
Enable/Disable Circuits	5
Inverting Logic	6
C-Programming using Cygwin	7
Boolean Reduction	8
DeMorgan's Theorem	9
Karnaugh Mapping	10
X-OR, X-NOR Gates	11
Arithmetic Circuits	12
Adder-Subtractor Circuits	13
ORCAD Familiarization	14

EET 141 (4 credits) Outcomes – Proposed Fall 2006-2007

Upon completion of this course the student will be able to:

1. Convert signed and unsigned integer numbers between any of the following representations; Binary, Decimal, Hexadecimal and explain their usage in computer technology.
2. Be able to model a system with output resembling a digital logic pulse using basic computer components such as transistors and relays.
3. Recognize, draw and communicate diagrams and logic tables for general digital logic gates using electronic media such as word processor or database software files.
4. Write ANSI C programs to perform simple arithmetic (add, subtract, multiply, divide) and binary bit manipulation (bit shifting, bit compare, bit complement) similar to the functionality of a computer.
5. Write ANSI C programs to simulate digital combinatorial logic and understand the design considerations in the construction of hardware digital circuits.
6. Understand the differences between TTL and CMOS based logic and understand the design considerations necessary to hardware interface CMOS and TTL circuit components.
7. Develop a working knowledge of computer technology terms and concepts associated with computer logic components.
8. Understand and use Boolean algebra to retrieve serial logic information from an electronic communication channel.
9. Understand and solve problems involving Two's-complement arithmetic and recognize the limitations of the computer's computational capability.
10. Understand, diagram and build adder circuits using logic gates.
11. Understand, diagram, simulate (using C programming) and build ALU circuits using logic gates.
12. Effectively prepare written reports on laboratory experiments which discuss ethical ramifications of using computer components in different applications and develop presentations on the results of experiments and projects for distribution through electronic media.

13. Demonstrated competency in the use of the protoboard and multimeter equipment and an understanding of the responsibilities associated with working in an electronics laboratory.

EET 141 Integrated Computer Technology I

Review of Course Outcomes vs. match to the Information Technology Category.

Category requirements:

FYEX 100

Category 13: Information Technology

(requires 0-2 credits)

Goals: To familiarize students with the tools, concepts and societal impact of information technology and to develop the skills necessary to use this technology critically and effectively.

Students will be able to:

- (a) use electronic information technology ethically and responsibly;
- (b) access and retrieve information through electronic media, evaluating the accuracy and authenticity of that information;
- (c) create, manage, organize and communicate information through electronic media;
- (d) demonstrate a working knowledge of information technology terms and concepts;
- (e) understand how computers function and the limits of computation and information technology;
- (f) recognize changing technologies and make informed choices in their use.

EET 141 Integrated Computer Technology I
Course Proposal
Resource Needs

Resources to support this course will result from allocation of existing department resources and with the assistance of the College of Science Engineering and Technology to support and growth and advancement of ECET programs.”

EET 141 Integrated Computer Technology I
Course Proposal
Staff Impact & Needs

Staff Impact – Staffing resources to support this course will result from allocation of existing department resources and with the assistance of the College of Science Engineering and Technology to support and growth and advancement of ECET programs.

EET 141 (4 credits) Outcomes – Proposed Fall 2006-2007 with mappings to Information Technology Category Objectives

Upon completion of this course the student will be able to:

1. Convert signed and unsigned integer numbers between any of the following representations; Binary, Decimal, Hexadecimal and explain their usage in computer technology. *Objective e*
2. Be able to model a system with output resembling a digital logic pulse using basic computer components such as transistors and relays. *Objective d*
3. Recognize, draw and communicate diagrams and logic tables for general digital logic gates using electronic media such as word processor or database software files. *Objective c, Objective d*
4. Write ANSI C programs to perform simple arithmetic (add, subtract, multiply, divide) and binary bit manipulation (bit shifting, bit compare, bit complement) similar to the functionality of a computer. *Objective e*
5. Write ANSI C programs to simulate digital combinatorial logic and understand the design considerations in the construction of hardware digital circuits. *Objective d*
6. Understand the differences between TTL and CMOS based logic and understand the design considerations necessary to hardware interface CMOS and TTL circuit components. *Objective f*

7. Develop a working knowledge of computer technology terms and concepts associated with computer logic components.
Objective b, Objective d
8. Understand and use Boolean algebra to retrieve serial logic information from an electronic communication channel.
Objective b, Objective d
9. Understand and solve problems involving Two's-complement arithmetic and recognize the limitations of the computer's computational capability. *Objective e*
10. Understand, diagram and build adder circuits using logic gates. *Objective e*
11. Understand, diagram, simulate (using C programming) and build ALU circuits using logic gates. *Objective d*
12. Effectively prepare written reports on laboratory experiments which discuss ethical ramifications of using computer components in different applications and develop presentations on the results of experiments and projects for distribution through electronic media. *Objective a, Objective d*
13. Demonstrated competency in the use of the protoboard and multimeter equipment and an understanding of the responsibilities associated with working in an electronics laboratory. *Objective d*

EET 141 Integrated Computer Technology I

Review of Course Outcomes vs. match to the Information Technology Category.

Category requirements:

FYEX 100

Category 13: Information Technology
(requires 0-2 credits)

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Objectives:

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