COMMON COURSE OUTLINE:  Course discipline/number/title:  ENGR 1152: Logic Design

A.  CATALOG DESCRIPTION
1.  Credits: 4
2.  Hours/Week: 3 hours lecture/discussion and 2 hours lab per week
3.  Prerequisites (Course discipline/number):  MATH 1115 (may be taken concurrently)
4.  Co-requisites (Course discipline/number):  MATH 1115
5.  MnTC Goals (if any):  NA

This course covers fundamental digital circuit design.  Topics include truth tables, Boolean algebra, Karnaugh maps, logic gates, digital devices, sequential systems, flip-flops, counters, and design involving these elements.  The accompanying laboratory provides hands-on experience designing, building, and testing digital circuits.  Recommended Entry Skills/Knowledge: College level reading and writing skills are required.

B.  DATE LAST REVISED (Month, year):  April, 2008

C.  OUTLINE OF MAJOR CONTENT AREAS:
Lecture:
1.  Number systems
2.  Truth tables
3.  Boolean algebra
4.  Logic gates
5.  Karnaugh maps
6.  Encoders and decoders
7.  Multiplexers and demultiplexers
8.  Analysis of sequential systems
9.  State tables and state diagrams
10.  Flip flops
11.  Design of sequential systems
12.  Counters
13.  Shift registers
14.  Programmable logic devices
15.  Simplification of sequential systems

Lab:
1.  Measurement
2.  Electronic equipment familiarity
3.  Breadboards
4.  Creation of circuits from a design
5.  Trouble-shooting
6.  Testing
7.  Technical writing

D.  LEARNING OUTCOMES (GENERAL):  The student will be able to:
Develop familiarity with basic logic operations by using Boolean principles and truth tables, setting up and checking logic operations using electronic gate circuits, developing skill in logic design of combination circuits, developing a familiarity with the application of flip-flops, counters and registers, microcomputers and their logic.

E.  LEARNING OUTCOMES (MNTC):  NA

F.  METHODS FOR EVALUATION OF STUDENT LEARNING:
Evaluation methods may include any or all of the following:
1.  Objective exams
2.  Essay exams
3.  Research papers
4.  Quizzes
F. METHODS FOR EVALUATION OF STUDENT LEARNING: Continued...
5. Written homework
6. Small group projects
7. Oral presentations
8. Laboratory reports
9. Or any other as deemed appropriate by the instructor and so indicated by his/her syllabus (original or revised)

G. SPECIAL INFORMATION (if any):
The student is required to have a scientific calculator.