University of Toledo
Electrical Engineering Technology
Master Syllabus

Course Title: C Programming **Course Code & Number:** EET-3150

Credit Hour Total: 4 **Weekly Contact Hours Lecture:** 2 **Lab Hours:** 2

Pre-requisite: EET- 2210, Digital Logic Fundamentals

Text: The C Programming Language, 2nd Ed. Kernigan, Ritchie, 1988

Course Coordinator: Kamm

A. Course Description This course emphasizes C programming. Design of a microcontroller system including hardware, interface, and programming using C is implemented. Lab exercises cover the areas of interrupts, structures and other programming concepts.

B. Related Program Outcomes (a, b, c, e, f, g):

ABET/Student Outcomes

a. An understanding of the analytical and laboratory skills associated with electrical engineering technology as evidenced by the ability to perform:
   - Analysis of complex Microprocessor circuits using PC Bus-Based Interfacing, memory design, and I/O interface.
   - Building, Testing, and Troubleshooting Circuits.

b. An ability to apply current knowledge and adapt to emerging applications of mathematics, science and technology, as evidenced by the ability:
   - To review, digest, and apply the latest technology in the emerging area of microprocessors.

c. An ability to conduct, analyze, and interpret experiments concerning microprocessor circuits, as evidenced by:
   - The ability to perform various lab exercises using the PC Micro Laboratory Test equipment.
   - Written reports for select experiments.

e. An ability to function as part of a team, as evidenced by:
   - Working with other students in a team of 2 students on a project.

f. An ability to identify, analyze and solve technical problems associated with microcomputer systems, as evidence by:
   - An ability to solve problems on class quizzes, tests, and final examination.
   - An ability to participate in class discussions and solve problems open for discussion during class time.

g. An ability to communicate effectively, as evidenced by:
   - Written reports of projects.

EET Program Outcomes

None

C. Course Objectives:

1. Understand how microcomputers can be programmed. Also, program with Arduino micro-controller.
2. An ability to analyze and control the computer's memory sing pointers, read and write variables.
3. An ability to perform the string manipulations and also create array of strings.
4. An ability to debug the code. Also, optimize the code to make it run fast and effectively.
5. Understand the basic portability problems and ways to overcome those issues.
6. An ability to communicate effectively, as evidenced by laboratory reports.

D. Course Outline – Major Content Areas

- History of C and basics of programming
- Programming process
- Declarations and expressions
- Control statements
- Functions
- Variables, pointers and arrays
- Structures
- Input and Output

E. Major Laboratory Topics

- PC Bus-Based Interfacing.
- Use of the PC Micro Laboratory Test Equipment.
- Experimenting with the On-Board Circuitry of the PC Micro Lab.
- Building, Testing, and Trouble shooting microcomputer systems.
- Observing Microcomputer Bus Activity with a Digital Logic Analyzer.