1. **COURSE TITLE\*: Microcontroller Programming**
2. **CATALOG – PREFIX/COURSE NUMBER/COURSE SECTION\*: EENG 2260**
3. **PREREQUISITE(S)\*: None COREQUISITE(S)\*: None**
4. **COURSE TIME/LOCATION: (*Course Syllabus – Individual Instructor Specific*)**
5. **CREDIT HOURS\*: 3 LECTURE HOURS\*: 3**

 **LABORATORY HOURS\*: (contact hours) OBSERVATION HOURS\*:**

1. **FACULTY CONTACT INFORMATION: *(Course Syllabus – Individual Instructor Specific)***
2. **COURSE DESCRIPTION\*:**

This course is intended for students who want to learn about C Programming and how it can be interfaced with a microcontroller. It does not assume any prior knowledge of C Programming and is geared toward those interested in coding and having that code effect hardware in the real world. The course provides comprehensive coverage of topics related to C Programming, including data types, program loops, functions, storage classes and libraries.

1. **LEARNING OBJECTIVES\*:**
2. Introduce critical thinking and logical problem-solving skills
3. Develop structured problem-solving techniques
4. Develop the skills necessary to problem solve in logical steps and be able to communicate those steps.
5. Introduction to programming language concepts using Arduino C
6. Explain data types, operators, functions, structures and libraries
7. Determine input/output controls using methods
8. Program for looping and conditional branching
9. Examine debugging techniques
10. Conduct array processing and structuring data using classes
11. **ADOPTED TEXT(S)\*:**

*Beginning C for Arduino: Learn C Programming for the Arduino*

Authors: Jack Purdum

ISBN-13: 978-1430247760

ISBN-10: 1430247762

**9a: SUPPLEMENTAL TEXTS APPROVED BY FULL TIME DEPARTMENTAL FACULTY (INSTRUCTOR MUST NOTIFY THE BOOKSTORE BEFORE THE TEXTBOOK ORDERING DEADLINE DATE PRIOR TO ADOPTION) \*\*\*.**

1. **OTHER REQUIRED MATERIALS: (SEE APPENDIX C FOR TECHNOLOGY REQUEST FORM.) \*\***

Arduino Uno R3 Microcontroller Card & USB Cable

1. **GRADING SCALE\*\*\*:**

Grading will follow the policy in the catalog. The scale is as follows:

A: 90 – 100

 B: 80 – 89

 C: 70 – 79

 D: 60 – 69

 F: 0 – 59

1. **GRADING PROCEDURES OR ASSESSMENTS:**

|  |  |  |
| --- | --- | --- |
| *Category* | ***EXAMPLE ONLY****Total Points* | *% of Grade* |
| Chapter Assignments (10x30) | 300 | 30% |
| Quizzes (10x20) | 200 | 20% |
| Unit Exams (3x100) | 300 | 30% |
| Assignments (5x10) | 50 | 5% |
| Annual Report Project (100) | 100 | 10% |
| Attendance | 50 | 5% |
| Total | 1000 | 100% |

1. **COURSE METHODOLOGY OR COURSE FORMAT:**

May include but not limited to: Lectures, independent and group projects, in-class and home assignments, tests, quizzes and lab exercises. This course must be offered on campus. Attendance is required.

1. **COURSE OUTLINE:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Week** | **Topics** | **Chapters** | **Learning Objectives** |
| **1** | Introduction  | Chapter 1 | 1 |
| **2** | Arduino C | Chapter 2 | 1 2 4 |
| **3** | Arduino C Data Types | Chapter 3 | 1 2 3 4 |
| **4** | Decision Making in C | Chapter 4 | 1 2 3 |
| **5** | Program Loops in C | Chapter 5 | 1 2 3 7 |
| **6** | Functions in C | Chapter 6 | 1 2 3 5 |
| **7** | Mid-Term Project Preparation |  | 1 2 3  |
| **8** | Mid-Term Exam / Project |  | 1 2 3 5 7 |
| **9** | Storage Classes and Scope | Chapter 7 | 1 2 3 6 |
| **10** | Introduction to Pointers | Chapter 8 | 1 2 |
| **11** | Using Pointer Effectively | Chapter 9 | 1 2 6 |
| **12** | Structures, Unions, and Data Storage | Chapter 10 | 1 2 8 |
| **13** | The C Preprocessor and Bitwise Operations | Chapter 11 | 1 2 9 |
| **14** | Arduino Libraries | Chapter 12 | 1 2 5 8 |
| **15** | Final Exam Project Preparation |  | 1 2 3 |
| **16** | Final Exam / Project |  |  |

**15. SPECIFIC MANAGEMENT REQUIREMENTS\*\*\*: None**

**16. OTHER INFORMATION\*\*\*:**

**FERPA:** Students need to understand that your work may be seen by others. Others may see your work when being distributed, during group project work, or if it is chosen for demonstration purposes. Students also need to know that there is a strong possibility that your work may be submitted to other entities for the purpose of plagiarism checks.

**DISABILITIES:** Students with disabilities may contact the Disabilities Service Office, Central Campus, at 800-628-7722 or 937-393-3431.