

# Hagerstown Community College Master Syllabus

## ELE 105: Microprocessors & Microcontrollers

### Course Information

Course #: ELE 105 Microprocessors & Microcontrollers

3 Credits

Spring 2019

### Instructor Information

### Course Description

In this course, students will study the basics of microprocessors/microcontrollers and their applications in industry. A number of topics are covered, including: introduction to programming in C, assembly language, hardware configurations, pin functions, modes of operation, and basic input/output timing, control and memories. The goal is for students to be able to design, analyze, and program microprocessors - microcontrollers.

Total of 45 hours of lecture.

### Textbook and Course Materials

*Embedded Computing and Mechatronics with the PIC32 Microcontroller. 1st Edition.*

Kevin Lynch, Nicholas Marchuk, Matthew Elwin. Newnes-Elsevier. ISBN: 9780124201651

*Electronic Resources:*

*Practical programming in C -Course Notes MITOPENCourseWare. MIT Course Number 6.087*

*HCC Library-Ebook Central: Beginning Arduino [electronic resource] / by Michael McRoberts.*

*ISBN:9781430250173*

*HCC Library-Ebook Central: Raspberry Pi User Guide [electronic resource] / by Brendan Horan. ISBN:*

*9781118795460*

### Student Learning Outcomes

- Have a sound introduction to microcontroller hardware.
- Understand the fundamentals of hardware programming techniques in C and assembly language.
- Read with proficiency reference material and microcontroller code.
- Understand the theory and operation of motor control code and circuitry.
- Be able to interface microcontroller peripherals with external sensors and motors.

### Definition of Credit Hour: Classroom Courses

To earn one academic credit at HCC, students are required to complete a minimum of 37.5 clock hours (45 fifty-minute academic hours) of coursework per semester. Those hours of coursework may be completed through a combination of hours in the classroom and hours outside the classroom. Certain courses may require more than the 37.5 minimum hours of coursework per credit. For most classes, students should expect to complete at least 2 hours of coursework outside of class for each hour of in-class coursework.

Classwork type	Direct Faculty Instruction In-class <b>37.5 hours required</b>	Student Work Out of Classroom <b>75 hours required</b>
In-class lecture and discussion	45 hours	
Reading		48 hours
Quiz/exam studying		12 hours
Reading question completion		8 hours
Paper writing		18 hours
<b>Total</b>	<b>45 hours</b>	<b>86 hours</b>

**Services for students with disabilities:** Students may receive reasonable accommodations if they have a diagnosed disability and present appropriate documentation. Students seeking accommodations are required to contact the Disability Support Services (DSS) office as early as possible. Students may contact a DSS staff member for an appointment at [dss@hagerstowncc.edu](mailto:dss@hagerstowncc.edu) or at 240-500-2530.