

Hagerstown Community College
OFFICIAL COURSE SYLLABUS DOCUMENT

COURSE: ELE 235 – Advanced Concepts and Applications of Instrumentation and Controls
3 Credits

INSTRUCTOR:

SEMESTER/YEAR:

COURSE DESCRIPTION: Students will learn the concepts and applications behind combining electrical devices, electronic devices, instrumentation devices, and mechanical devices in the ever growing area of automation. Topics include advanced PLC and PC-based SCADA system monitor and control of complex processes. Total of 45 hours of lecture.

TEXTBOOK:

None

STUDENT LEARNING OUTCOMES:

On successful completion of this course, students should be able to:

- Design, select, program, and apply various Digital Instrumentation components in a wide variety of applications.
- Students should be able to collect and evaluate complicated data within the system design.
- Research and organize data to create a presentation that involves demonstration and a written paper on program area.

TOTAL HOURS OF COURSEWORK:

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 within 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 do at least 2 hours of coursework outside of class for each hour of in-class coursework.

COURSE CONTENT OBJECTIVES:

Upon completion of the course, the student should be able to:

- Apply Digital Instrumentation devices in multiple applications.
- Explain advanced uses of Digital Instrumentation in Industry.
- Explain the interaction between Mechanical, Electrical, and Electronic Instruments used in complex systems.
- Define and give examples of advanced SCADA systems.
- Demonstrate skills in research and data collection.
- Demonstrate skills in organization of data.
- Demonstrate presentation skills.
- Demonstrate competency in digital instrumentation and process control.

ASSESSMENT PROCEDURES:

Assignments	25%
Research/Final Project	50%
<u>2 Exams</u>	<u>25%</u>
Total:	100%

Grading scale for final grade:

A = 90% - 100%

B = 80% - 89%

C = 70% - 79%

D = 60% - 69%

F = 0% - 59%

Any violation of the Hagerstown Community College Honor System will result in a failing grade for the entire course.

COURSE POLICIES:

Attendance Policy: Students are expected to attend all classes. In the case of absence due to emergency (illness, death in the family, accident), or participation in official College functions, it is the student's responsibility to confer with the instructor about the absence and missed course work. Further, it is the student's responsibility to withdraw officially from any class, which he/she ceases to attend. Failure to do so may result in the recording of an "F" grade. Students absent from an announced (major) test or examination, unless authorized, may be given an equivalent examination later at the discretion of the instructor. Each unexcused absence will result in a deduction of 2% from overall grade (up to a maximum of 10%)

Honor Code: upon admission to HCC, all students sign a pledge to uphold an honor system, which holds the qualities of honesty and integrity in highest regard for the duration of their educational experience. The HCC Honor Code Policy and Procedures is published in the Student Handbook and may be obtained in the Student Activities Office.

Continuing Education Students: A certificate of completion will be presented to CE students who attend at least 75% of scheduled classes.

Academic Dishonesty: Plagiarism and cheating are serious offenses and may be punished by failure on exam, paper, or project; failure in course; and or expulsion from HCC.

Reading and Workbook Assignments are due at the beginning of class on the date indicated in the course schedule. Five points may be subtracted from late assignments. Assignments will not be accepted after one week late.

Cell phone calls, texting or web usage is not permitted in the classroom. Please turn them off or set them onto "Airplane Mode" prior to entering the classroom.

Services for Students with Special Needs: Students who have special needs are encouraged to identify themselves to the Coordinator of Disability Services as early as possible.

Reasonable accommodations based on current documentation are provided to qualified students. Contact:

Jaime L. Bachtell Coordinator, Disabilities Services
Department: Disability Services
Email: bachtellj@hagerstowncc.edu
Phone: 301-790-2800 x 273

Disclaimer: The instructor reserves the right to alter the course content, assignments, examination due dates, and grading as circumstances arise.

CONTACT INFORMATION:

TOPICAL OUTLINE:

- Digital Instrumentation Application Review.
- Complex Mechanical, Electrical, and Electronic Instruments Systems
- Enterprise Architectures: Shop Floor to Enterprise Software
- Research Paper: Digital Instrumentation & Control System Topics
- Project, selected from below:
 - Integrated Factory Implementation (FESTO), implementing instruments, PLCs, SCADA and MES / Data Collection Systems
 - Integrated Intelligent Machine Design: Microcomputer-based intelligent toy, appliance, or clothing with complete integrated design, including SCADA tracking, and Data Collection.
 - Other project demonstrating, skills in research and data collection, skills in organization of data, and competency in digital instrumentation and process control
- Final Presentations to Regional Industry Experts