

Hagerstown Community College
OFFICIAL COURSE SYLLABUS DOCUMENT

COURSE: ELE 205 – Repair and Maintenance for Instrumentation

2 Credits

INSTRUCTOR:

SEMESTER/YEAR:

COURSE DESCRIPTION: Students will learn how to troubleshoot and repair typical instrumentation components using logical thinking, diagrams, and sequential techniques. Students will learn to recognize typical alarm conditions and take the appropriate corrective action. Students will recognize self-diagnostic errors and resolve the issue which caused the error. Use of measurement and testing equipment will be emphasized along with safe trade practices. Total of 30 hours of lecture.

TEXTBOOK:

Industrial Electrical Troubleshooting, Lynn Lundquist, 2000, Delmar Cengage Learning, ISBN-10: 0-7668-0603-0

Maintenance of Instruments & Systems: Practical Guides For Measurement And Control (Practical Guides for Measurement and Control), Lawrence D. Goettsche, ISA: The Instrumentation, Systems, and Automation Society; 2 edition (November 1, 2004) , ISBN-10: 1556178794, ISBN-13: 978-1556178795

STUDENT LEARNING OUTCOMES:

- Apply correct practice to calibration and maintenance of instruments
- Calibrate electronic transmitters and controllers
- Apply Intrinsic safety techniques to instrumentation installation
- Maintain instruments correctly
- Troubleshoot, isolate and fix electronic instrumentation problems
- Apply ISO 9000 to maintenance practices
- Effectively apply the principles of analog meters, digital meters and oscilloscopes
- Carry out simple repair procedures for the correction of faults on instrument systems

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:

- Instrumentation and control system maintenance personnel: demonstrate the ability to name and describe the roles, and correctly search for job opportunities within this field.

- Maintenance management and maintenance engineering: demonstrate broad understanding of the application and practice to repair, calibration and maintenance of instruments, including hands-on experience with at least 4 varieties of instruments.
- Service / contract maintenance: Understand roles and applications of maintenance contracts and the business opportunities
- Configuration and programming: Understand configuration and programming techniques for standard instrumentation
- Calibration, standards, certification, marking and approval: Calibrate electronic transmitters and controllers, document, and apply ISO 9000 to maintenance practices
- Tuning detail: apply the principles of analog meters, digital meters and oscilloscopes
- Maintenance and troubleshooting: troubleshoot, isolate and fix electronic instrumentation problems, as well as carry out simple repair procedures for the correction of faults on instrument systems
- Safety / Hazardous Areas: Apply Intrinsic safety techniques to instrumentation installation

ASSESSMENT PROCEDURES:

Assignments	25%
Research/Final Project	25%
<u>2 Exams</u>	<u>50%</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.

TOPICAL OUTLINE:

- Introduction.
- Fundamental principles
- Instrumentation and control system maintenance personnel
- Maintenance management
- Maintenance engineering
- Service / contract maintenance
- Configuration and programming
- Calibration, standards, certification, marking and approval
- Tuning details
- Maintenance and troubleshooting
- Safety / Hazardous Areas
- Integration of the system

CONTACT INFORMATION: