MARION TECHNICAL COLLEGE
COURSE SYLLABUS STANDARD TEMPLATE

COURSE NUMBER & NAME: SMT 1200 Instrumentation and Control

TERM/YEAR: Spring 2023

DAY/TIME: M/W 12:00-1:50 PM

DEPARTMENT NAME: Engineering Technologies

TAG/OTM/CTAG[1] COURSE #:
 (if applicable)

DELIVERY METHOD: [X] Traditional   [ ] Blended   [ ] Online

CREDIT HOURS: 2

COURSE REQUIREMENT(s):   EET 2010

INSTRUCTOR(s):

TELEPHONE: **EMAIL/OTHER CONTACT INFO:**

BLDG/OFFICE NO: **OFFICE HOURS:** *(for student support)*

IN CASE OF EMERGENCY: Dial 9-911 from any office or courtesy phone on-campus.

COURSE DESCRIPTION:
This course is to provide a comprehensive review of equipment which is used to monitor and control automation systems. Various instruments such as the sensors, transmitters and PID controllers will be covered. Their installation, calibration and data transfer will be explained. Industrial standards and communication protocols of the systems will be introduced. Field tools such as the handheld Hart communicator will be demonstrated. The communication between the instruments and PLCs including the hardware and software will be taught. The PID algorithm will also be a topic in this course. These concepts will be applied using various equipment, including a fluid flow process control trainer.

TEXTBOOK:

AUTHOR(s):

PUBLISHER:

YEAR/EDITION:

OTHER RESOURCES/ TEXTBOOK:

MAJOR COURSE LEARNING OBJECTIVES

A student completing this course will be able to:

1.   Explain the block diagram of control scheme.
2.   Install sensors.
3.   Install transmitters.
4.   Install PI valve.
5.   Calibrate sensors.
6.   Calibrate transmitters.
7.   Connect input devices to PLCs.
8.   Connect output devices to PLCs.
9.   Tune PID

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[1] Approved TAG and OTM courses carry the guarantee that the courses and their credits will transfer and apply toward the major at any of Ohio's public institutions of higher education, provided they were taken when the courses were equivalent. Additional Ohio transfer information may be obtained at https://www.ohiohighered.org/

COURSE OUTLINE

INSTRUCTIONAL WEEKS	CHAPTER	TOPIC/ASSIGNMENT	
Week 1		Introduction: Basics of automation: components, layout and applications.	
Week 2		Background to automation control: Smart Instruments; Typical automation control installations;	
Week 3		Automation hardware; Communication architectures. Sensor calibration	
Week 4		Transmitter calibration	
Week 5		PID controller	
Week 6		Controller calibration	
Week 7		Sequential control and batch processing; PID Control: when it should or should not be used;	
EXAM WEEK*	**DAY**	**TIME**	**LOCATION/ROOM**
Week 8		Exam	
	*Exams <u>must</u> be held during exam week (the 16th week of the term), except for 8-week half session courses or the summer terms where exams are held on the last day the class meets for that term.		

> **NOTE:**   *This is a tentative schedule and subject to change at the discretion of the instructor.*
>
> *If there is a need for reasonable accommodation or assistance because of mental, physical or learning disability, the student is requested to contact the instructor or the Director of the Disability Services within the first two weeks of class.*

ADDITIONAL INFORMATION:

Eating and drinking are not permitted in any computer classroom or lab. All copyright laws will be observed. It is illegal to copy software.

EVALUATION & GRADING PROCEDURES

ATTENDANCE AND PARTICIPATION:

Consistent with College Policy #520 – Class Attendance and as stated on Page 8 of the **Student Handbook** http://www.mtc.edu/wp-content/uploads/MyMTCDocs/StudentHandbook.pdf, the student is responsible for attending every class and for the material presented. If a student will not be attending a class, he or she is responsible to contact the instructor and to make sure all assignments are completed, <u>prior to the scheduled class</u>. Some departments have special provisions regarding missed work and absences. Please contact your instructor for additional information.

ONLINE CLASS ATTENDANCE:

GRADING PROCEDURES:

> **EXAMPLE:** *Three exams will be given. Each exam will consist of an objective section and a practical section. Each exam will be graded on the basis of 100 points and a total of 30 points for homework.*

<u>**GRADING SCALE:**</u>

90 -100 = A
80 - 89 = B
70 - 79 = C
60 - 69 = D
0 - 59 = F

FINAL GRADE CRITERIA:

Labs---------- 35%
Final----------65%

MAKE-UP AND LATE POLICY:

Make-up exams will be given only for excused absences as determined by the instructor. The instructor must be notified of the prospective absence <u>prior to the time scheduled for the examination</u>. The make-up exam may be a different exam than the exam given during the scheduled exam time.

CREDIT HOUR DEFINITION

Credit Hour: Marion Technical College subscribes to the federal definition of the "credit hour" endorsed by the Higher Learning Commission that typically requires students to work on out-of-class assignments a *minimum of twice the amount of time* as the amount of formalized instruction.

Examples:

Minimum Homework Hours Per Week for 3 Credit Course (16-Week Term)	
Delivery Format	Homework Per Week
Traditional	6 hours
Blended	6.75 – 8.25 hours
Online	9 hours

Minimum Homework Hours Per Week for 3 Credit Course (8-Week Term)	
Delivery Format	Homework Per Week
Traditional	12 hours
Blended	13.5 – 16.5 hours
Online	18 hours

COLLEGE GRADUATE COMPETENCIES

Assessment begins with a clear understanding of what students are expected to learn. College Graduate Competencies (CGC's) are common to all areas of study and apply to all students. The individual sub-skills defined in each CGC are taught, reinforced, and/or periodically measured in various courses throughout the curriculum. The six CGC areas and statements are:

1. **Communications:** Communicate effectively both written and orally.
2. **Mathematics:** Solve problems using mathematics.
3. **Problem-Solving:** Solve problems through analysis, creativity, and synthesis to make informed decisions.
4. **Professionalism:** Demonstrate good work habits, effective interpersonal and teamwork skills, and a high level of professionalism.
5. **Technology:** Use technology tools efficiently and effectively to perform personal and professional tasks.
6. **Diversity:** Exhibit respect and sensitivity for individual and institutional differences.

COMMUNICATIONS DEVICE USAGE

All personal communication devices, including cell phones, must be set to vibrate or off while in classrooms, labs and participating in other class-related activities, unless the use of such a device is specified in the official course syllabus. Infractions will result in warnings and, eventually, grade-related penalties. Exceptions must be approved in writing by the instructor.

Additionally, all personal communication devices, including cell phones, <u>must be deactivated (turned completely off) during exams, quizzes or other evaluations</u>. Any student found to be using a communication device during an exam will be given a grade of zero for the exam.

EQUIPMENT REQUIREMENTS

Marion Technical College requires all students to obtain a computer with the following minimum specifications per program of study. Laptops are used in the classroom, outside of class using our learning management system, and Microsoft Office 365. Marion Technical College does not provide support of student-owned laptops.

Engineering Programs
Processor: i7 or better (note: Intel processor required)
RAM: 16 GB
SSD: 256 GB
Minimum Screen Size: 15.6"
Video Card for SolidWorks
Windows Operating System
Internet Connection
Webcam

Information Technology Programs
Processor: i7 or better (note: Intel processor required)
RAM: 16 GB
SSD: 256 GB
Minimum Screen Size: 15.6"
Windows Operating System
Internet Connection
Webcam

All Other Programs
Processor: i5/Ryzen 5
RAM: 8 GB (4 GB would also work – 8 GB gives flexibility if requirements change)
SSD: 256 GB
Minimum Screen Size: 15.6"
Windows Operating System
Internet Connection
Webcam

Frequently Used Software
Marion Technical College utilizes Microsoft Office 365. As such students get free access to Microsoft Office 365.

Note: Tablets, iPads, MacBooks, and Chromebooks will not meet the laptop requirements as they are unable to run Microsoft 365 ProPlus.

ACADEMIC MISCONDUCT

Examples of dishonest or unacceptable scholarly practice at Marion Technical College include but are not limited to:

A. Work copied verbatim from an original author; work copied practically verbatim with some words altered from the original without proper credit, i.e., reference citations, being given; a copyright explanation and more information is available at www.copyright.com.

B. Copying answers [and/or electronic data] from another's test paper, quizzes, notes, book, etc.

C. Evidence of a deliberate and calculated plan to engage in a dishonest academic practice, such as gaining access to examinations prior to the time the exam was to be given or the extraction of information regarding an examination from other students.

D. Falsification of clinical, practicum, or laboratory records.

E. Plagiarism – using someone else's ideas or words as your own. In an educational setting you can avoid plagiarism by providing appropriate source documentation. For more information on plagiarism, visit www.plagiarism.org.

F. Unauthorized collaboration with others or use of prior work (e.g., submitted for another assignment in a different course) without permission or citation (if previously published).

Note: Please also see the Academic Misconduct section in the ***Student Handbook*** on the college website at http://www.mtc.edu/

FINANCIAL AID ATTENDANCE REPORTING

Marion Technical College is required by federal law to verify the enrollment of students who participate in Federal Title IV student aid programs (Federal grants and student loans) and/or who receive educational benefits through the Department of Veterans Affairs. It is the responsibility of the College to identify students who do not commence attendance or who stop attendance in any course for which they are registered and paid. Non-attendance is reported by each instructor, and can result in a student being administratively withdrawn from the class section. Please contact the Financial Aid Office for information regarding the impact of course withdrawals on financial aid eligibility.

ACCOMMODATIONS FOR DISABILITIES

If a student has any kind of visible or non-visible disability -- learning, emotional, physical, health, or cognitive - - and needs possible accommodations for lectures, assignments, or exams, they should contact the Office of Student Disability Services as early as possible to discuss reasonable accommodations for their access needs. The Office of Student Disability Services is located in the Student Resource Center (SRC), BR Room183F; the phone number for the Office of Student Disability Services is 740.386.4222, or email Jenifer Montag, Director of the Office of Disability Services, at montagj@mtc.edu. If students already have a diagnosis, Disability Services can help them document their needs and create an accommodation plan. By making a plan through Disability Services, students can facilitate appropriate accommodations without disclosing their condition or diagnosis to their course instructor(s).

TITLE IX NON-DISCRIMINATION FOR STUDENTS

No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subject to discrimination under any educational program or activity receiving Federal financial assistance.

- Sexual harassment and acts of sexual violence such as rape, sexual assault, sexual exploitation, dating violence, domestic violence, are forms of sex discrimination prohibited.
- Also non-discrimination for students experiencing pregnancy/childbirth/parenting impacts on their education

Report any discrimination, or ask questions of the Title IX Coordinator.

- Title IX Coordinator: Cretia Johnson (johnsonc@mtc.edu; (740) 386-4195)
- Pregnancy/Childbirth/Parenting adjustments or concerns – contact Jenifer Montag, Director MTC Disability Services (montagj@mtc.edu; (740) 386-4222)

MTC SYLLABUS ADDENDUM

The syllabus addendum information is provided to help make students more aware of resources which may aid in their academic success such as tutoring, disability services, academic advising, financial aid, emergency procedures, etc. For additional information on these topics, please refer to:
https://www.mtc.edu/wp-content/uploads/MyMTCDocs/Syllabus_New-Addendum.pdf