ISET-1814: PRODUCTION TECHNICIAN AND MAINTENANCE II

Cuyahoga Community College

Viewing: ISET-1814 : Production Technician and Maintenance II

Board of Trustees:
5/23/2024

Academic Term:
Fall 2025

Subject Code
ISET - Integrated Systems Engineering

Course Number:
1814

Title:
Production Technician and Maintenance II

Catalog Description:
This course provides a comprehensive understanding of the basic principles of manufacturing, covering key areas such as manufacturing automation, maintenance, quality practices, measurement, and maintenance awareness.
Participants will gain a thorough understanding of these concepts through guided instruction and practice, equipping them with the skills and knowledge necessary to excel in any manufacturing or production environment.

Credit Hour(s):
3

Lecture Hour(s):
2

Lab Hour(s):
2

Requisites

Prerequisite and Corequisite
ISET 1813 or instructor approval

Outcomes

Course Outcome(s):
Identify customer needs and production equipment operation, determine resources available for the production process, set up and verify equipment for the production process, and set team production goals.

Objective(s):
- Participate in mock plan/do/check act cycle
- Identify different manufacturing layout options
- Review manufacturing techniques
- Review mock manufacturer charts against product specifications to confirm part selections

---

Course Outcome(s):
Make job assignments, Coordinate workflow with team members and other work groups, communicate production and material requirements and product specifications, Perform, monitor, and document the process to make the product, Document product and process compliance with customer requirements, Prepare final product for shipping or distribution

Objective(s):
- Review production requirements vs staff certifications
- Communicate mock production requirements between departments

- Test mock process parts for compliance against written standard
- Document and test shipping requirements for multiple products

---

Course Outcome(s):

Perform preventive maintenance and routine repair, monitor indicators to ensure correct operations, perform all housekeeping to maintain production schedule

Objective(s):

- Review TPM concepts
- Identify common preventative maintenance needs
- Practice Kanban and 5S organizational systems
- Describe common computer controls (PLC, CNC, Robot)

Course Outcome(s):

Recognize potential maintenance issues with basic production systems, including knowledge of when to inform maintenance personnel about problems

Objective(s):

- Explain simple electrical systems and symbols
- Explain simple pneumatic/hydraulic systems and symbols
- Explain simple lubrication and rotation systems
- Explain simple belt, chain, and gear drive systems
- Review common welding symbols

Methods of Evaluation:

1. Completion of assigned homework
2. Periodic quizzes
3. Exams
4. Simulations and Applied Demonstrations

Course Content Outline:

1. Production
1. Principles of Manufacturing Automation
2. Industry 4.0 Technologies
3. Advanced Manufacturing Materials
4. Advanced Manufacturing Processes
5. Mechanical Power
6. Basic Mechanical Elements
7. Power Efficiency
8. Hand Tools
9. Band Saw Operation
10. Introduction to the Drill Press
11. Machine Operations 1
12. Machine Operations 2
13. Introduction to CNC Machining
14. CNC Workspace
15. CNC Programming and Operation
16. Automated System Operations
17. Machine Adjustments
18. Machine Troubleshooting
19. Manufacturing Metrics
20. Production Planning and Workflow

21. Introduction to Lean Manufacturing
22. Lean Manufacturing Organization
23. Lean Manufacturing Operations
24. Inventory Management
25. Production Control
26. Material Quality Control

2.Maintenance

1. Total Productive Maintenance (TPM)
2. Mechanical Power Transmission
3. Gear Drives
4. Belt Drives
5. Chain Drives
6. Oil Lubrication
7. Grease Lubrication
8. Introduction to Fluid Power
9. Pneumatic Power
10. Basic Cylinder Circuits
11. Hydraulic Power
12. Basic Hydraulic Cylinder Circuits
13. Fluid Power Speed Control
14. Hydraulic Filtration
15. Basic Electrical Circuits
16. Electrical Voltage and Current Concepts
17. Electrical Resistance Measurement
18. Power in Electrical Circuits
19. Control Logic Circuits
20. Electrical Control Diagrams
21. Relay Control Circuits
22. Automation Sequence Circuits
23. Introduction to Electronic Sensors
24. Programmable Controller Operation
25. Basic PLC Programming
26. PLC Motor Control
27. Basic Robot Operation
28. Introduction to Welding
29. Welding Operations
30. Weld Types

Religious Accommodation

Before reviewing the course schedule, students should carefully review the following religious accommodation policy and other required instructional policies:

Religious Accommodation:

Students seeking an accommodation for absences permitted under Ohio's Testing Your Faith Act must provide the instructor with written notice of the specific dates for which the student requires an accommodation and must do so not later than fourteen (14) days after the first day of instruction. Please submit requests for accommodations at this link: https://portal2.tri-c.edu/ReligiousAccommodation/ Religious Accommodation Form. Students with questions about their religious accommodations under Ohio's Testing Your Faith Act may contact the College's Office of General Counsel and Legal Services by phone at 216.987.4856 or via email at legal@tri-c.edu.

Other Required Instructional Policies:

https://www.tri-c.edu/student-resources/curriculum/documents/syllabus-part-b.pdf

Weekly Schedule

	Topics
Week 1	Identify customer needs and production equipment operation, determine resources available for the production process, set up and verify equipment for the production process, and set team production goals.

Week 2	Identify customer needs and production equipment operation, determine resources available for the production process, set up and verify equipment for the production process, and set team production goals.
Week 3	Identify customer needs and production equipment operation, determine resources available for the production process, set up and verify equipment for the production process, and set team production goals.
Week 4	Identify customer needs and production equipment operation, determine resources available for the production process, set up and verify equipment for the production process, and set team production goals.
Week 5	Make job assignments, Coordinate workflow with team members and other work groups, communicate production and material requirements and product specifications, Perform, monitor, and document the process to make the product, Document product and process compliance with customer requirements, Prepare final product for shipping or distribution
Week 6	Make job assignments, Coordinate workflow with team members and other work groups, communicate production and material requirements and product specifications, Perform, monitor, and document the process to make the product, Document product and process compliance with customer requirements, Prepare final product for shipping or distribution
Week 7	Make job assignments, Coordinate workflow with team members and other work groups, communicate production and material requirements and product specifications, Perform, monitor, and document the process to make the product, Document product and process compliance with customer requirements, Prepare final product for shipping or distribution
Week 8	Make job assignments, Coordinate workflow with team members and other work groups, communicate production and material requirements and product specifications, Perform, monitor, and document the process to make the product, Document product and process compliance with customer requirements, Prepare final product for shipping or distribution
Week 9	Perform preventive maintenance and routine repair, monitor indicators to ensure correct operations, perform all housekeeping to maintain production schedule
Week 10	Perform preventive maintenance and routine repair, monitor indicators to ensure correct operations, perform all housekeeping to maintain production schedule
Week 11	Perform preventive maintenance and routine repair, monitor indicators to ensure correct operations, perform all housekeeping to maintain production schedule
Week 12	Perform preventive maintenance and routine repair, monitor indicators to ensure correct operations, perform all housekeeping to maintain production schedule
Week 13	Recognize potential maintenance issues with basic production systems, including knowledge of when to inform maintenance personnel about problems
Week 14	Recognize potential maintenance issues with basic production systems, including knowledge of when to inform maintenance personnel about problems
Week 15	Recognize potential maintenance issues with basic production systems, including knowledge of when to inform maintenance personnel about problems
Week 16	Recognize potential maintenance issues with basic production systems, including knowledge of when to inform maintenance personnel about problems

The Course Schedule is subject to change due to pedagogical needs, instructor discretion, parts of term, and unexpected events.

Required/Recommended Readings

Readings may be selected from the following supplemental materials:

Mikell P. Groover. *Fundamentals of Modern Manufacturing: Materials, Process and Systems*.

JJ Keller. *OSHA Safety Training Handbook*.

The Council for Six Sigma Certification. *Six Sigma White Belt Certification: Training Manual*.

Resources for the Instructor

Mikell P. Groover. *Fundamentals of Modern Manufacturing: Materials, Process and Systems*. 7th. New York: Wiley, 2023.

JJ Keller. *OSHA Safety Training Handbook*. 8th. Neenah WI: JJ Keller & Associates Inc., 2024.

The Council for Six Sigma Certification. *Six Sigma White Belt Certification: Training Manual*. Buffalo WY: Harmon Living LLC, 2024.

Top of page
Key: 5235