MAT-AUTOMATION & MANUFACTURING

MAT 101. General Industry Safety
1 Credit (1)
Overview of general industry safety for entry-level individuals. Students will have the opportunity to earn a 10-hour general industry OSHA card. Restricted to Community Colleges campuses only.
Learning Outcomes
1. Discuss the general history of OSHA.
2. Discuss the general history of the U.S. safety movement.
3. Utilize the OSHA web site as a basic safety resource.
4. Recognize industry-related hazards.
5. Identify industry-related hazards.
6. Avoid industry-related hazards.
7. Follow proper basic first aid procedures in an emergency.
8. Avoid exposure to blood-borne pathogens in an emergency situation.
9. Interpret hazard communication. 1
10. Recognize proper lifting techniques. 1
11. Recognize personal protective equipment.

MAT 102. Print Reading for Industry
3 Credits (2+2P)
Reading, interpretation, and revisions of industrial technical drawings common to manufacturing, Aerospace, machine parts, electrical, hydraulic, and pneumatic drawings. Interpretation of engineering drawings and related shop calculations.
Learning Outcomes
1. Recognize fundamentals of shape descriptions.
2. Recognize fundamentals of size description and annotations.
3. Recognize industrial drawing types.
4. Recognize Industrial drawing types.
5. Understand basic geometric dimensioning and tolerances practices that applied to working drawings.
6. Identify standard threads and fasteners callouts and specifications.

MAT 105. Introduction to Manufacturing
3 Credits (2+2P)
Introduction to manufacturing evolution from basic assembly process to modern automated processes. Covers history, employability, soft skills, quality measurements, teamwork concept, production requirements, and considerations in plan layout and design. Minimum math proficiency of CCDM 114 required or math placement into MATH 1215 or higher. Restricted to: Community Colleges only.
Learning Outcomes
1. Classify Hazardous Materials.
2. Perform an Electrical Lockout/Tagout.
3. Locate and Interpret a Safety Data Sheet.
4. Interpret a Hazardous Material Identification Label.

MAT 106. Applied 3D Manufacturing Practices
3 Credits (2+2P)
Introduction to part production and manufacturing utilizing 3D printing processes. Introduction to creating 3D solid models utilizing CAD software and the creation of 3d printed parts utilizing filament or resin style 3D printers. Students will learn how to make selected parts starting from drawings/prints to completed projects. Basic elements of quality control will be introduced.
Learning Outcomes
1. Produce 3D solid models in CAD Software.
2. Read 2D and 3D technical drawings.
3. Manage Electronic files.
4. Utilize slicing software to prepare 3D solid models for 3d printing.
5. Apply industry standard design practices to produce desired 3D printed parts.
6. Produce 3D printed parts.
7. Apply elements of quality control in the 3D printing process.

MAT 110. Machine Operation and Safety
3 Credits (2+2P)
Introduction to the operation and safety aspects of various types of machinery and equipment, including both mechanical and electrical machines, Rigid Tubing, and Flexible Lines. Maintenance and safety operation of industrial equipment will also be covered. Restricted to: Community Colleges only. Crosslisted with: AERT 115
Learning Outcomes
1. Identify and analyze potential hazards associated with the operation of machinery and equipment, and apply appropriate safety measures to mitigate risks.
2. Demonstrate proficiency in implementing safety protocols and procedures when operating machinery and equipment, adhering to industry standards and regulations.
3. Apply critical thinking and problem-solving skills to troubleshoot issues related to the operation and safety of machinery and equipment, fostering a proactive approach to maintenance and risk management.
4. Gain practical skills in the maintenance and upkeep of industrial equipment, ensuring optimal performance, reliability, and safety.
5. Foster a safety-oriented mindset by recognizing the importance of personal protective equipment (PPE), safe work practices, and the responsibility to create a secure working environment for oneself and others.
6. Gain a deep understanding of file management principles, including folder structures, naming conventions, and version control, to ensure easy accessibility and retrieval of files.

MAT 130. Applied Industrial Electricity I
4 Credits (3+2P)
Electrical safety, AC and DC circuits, use and care of common measuring instrumentation, schematic and wiring diagrams, electromagnetism, National Electric Code branch circuits. Restricted to: Community Colleges only.
Prerequisite(s): MATH 1215 or ELT 120 or OETS 118.

MAT 135. Applied Industrial Electricity II
4 Credits (3+2P)
Relationship between motor power, speed, and torque, basic application of relay circuits, motor control circuits, inductance and capacitance factors, transformers, solid state devices circuits and applications. Restricted to: Community Colleges only.
Prerequisite(s): MAT 130.

MAT 221. Cooperative Experience I
1-6 Credits
Supervised cooperative work program. Student is employed in an approved occupation and rated by employer and instructor. Student meets in a weekly class. Graded S/U.

Prerequisite: consent of instructor.

MAT 234. Industrial Electricity Maintenance
3 Credits (2+2P)
Introduction into electrical systems, theory and uses for the different types of motors used in the industry and related industrial safety practices. DC, AC stepper and servo motors, motor speed and torque, motor performance, and efficiency, motor control fundamentals using variable frequency drives, vector controls, servo and stepper drives. Restricted to: Community Colleges only.

MAT 265. Special Topics
1-6 Credits
Course subtitled in the Schedule of Classes. May be repeated up to 12 credits.

Learning Outcomes

1. Learning goals will vary with the special topic selected for the course.