

# Process Control Manufacturing (PMFG)

## **PMFG 110 Industrial & Predictive Maintenance Fundamentals**

**5 credits | REEL**

**Quarter(s): W**

Introduces essential elements of industrial maintenance. Provides an overview of the jobs and tasks generally performed in manufacturing operations. Covers an overview of general types of industrial equipment, the proper use of a variety of hand tools and measuring instruments, and an exploration of fasteners, bearings, bushings, seals, and lubrication systems. Presents safety procedures including lockout/tag out of electrical/mechanical energy systems, sketching using ANSI standards, layout and machinery installation, and basic troubleshooting techniques.

Prerequisites: None

## **PMFG 150 Electrical and Electronic Fundamentals**

**6 credits | REEL**

**Quarter(s): F**

Introduces the nature and principles of electricity and electrical/electronic devices. Focuses on general principles, safety, industrial applications, and includes topics related to both DC and AC circuits. Topics explored include basic theory and direct current circuits, measuring instruments, interpretation of electrical and schematic diagrams, ohms law, basic electrical circuit analysis, applied mathematical concepts used in solving for values in series and parallel circuits, electrical safety and basic magnetic concepts. Additional topics are alternating current circuits, the use of AC measuring instruments, single phase and three phase AC distribution systems, transformers, and an overview of basic electronic devices, their function, and common applications. The course is designed for individuals entering the electrical trades, maintenance personnel or production/process operators.

Prerequisites: MATH 78/79 or higher or CCP 79 or concurrent enrollment, or instructor permission

## **PMFG 151 Process Control Equipment**

**5 credits | REEL**

**Quarter(s): F**

Provides an overview of process control equipment for operating personnel in industries utilizing process manufacturing techniques. Introduces the fundamentals of process control, control equipment and equipment fault identification and troubleshooting.

Prerequisites: None

**PMFG 154 Fundamentals of Instrumentation and PLCs****5 credits | REEL**

Introduces principles of instrumentation controls and devices. Discusses the process of converting information into electrical or pneumatic signals for measurement and control, and its industrial applications. Introduces compressed air systems, programmable logic control, current-to-pressure, and piping instrument diagrams. Builds on knowledge of electrical fundamentals. Prerequisites: PMFG 150 and PMFG 151 or instructor permission.

**PMFG 201 Electrical Control Equipment****3 credits | REEL****Quarter(s): W**

Introduces the operation, troubleshooting, and adjustment of various types of electrical control equipment. Fuses, molded case circuit breakers, and control switches are covered. Includes basic principles of motor starters and troubleshooting of control circuits.

Prerequisite: PMFG 150 or instructor permission.

**PMFG 202 Electric Motors****2 credits | REEL****Quarter(s): Sp**

Covers the concepts, maintenance, and testing of AC and DC motors. Includes a study of components and operation of a variety of AC motors and DC motors. Single-phase and three-phase motors are covered.

Prerequisite: PMFG 201 or instructor permission.

**PMFG 210 Advanced Industrial Maintenance****5 credits | REEL****Quarter(s): Sp**

Explores more advanced industrial maintenance topics, including preventative maintenance, centrifugal pump repair, valve repair, rigging and lifting, vibration analysis, and shaft alignment. Safe work practices are stressed, and relevant safety topics are covered during the course.

Prerequisite: PMFG 110 or instructor permission.

**PMFG 220 Introduction to Renewable Energy****5 credits | REEL****Quarter(s): Sp**

This course provides an introduction to renewable energy sources. Topics will include biomass for fuels and electricity generation, solar, wind, geothermal and hydroelectric energy. Students will compare technology, social, environmental and economic impacts of renewable energy. Upon completion, students will be able to demonstrate an understanding of renewable energy and its impact on humans and the environment.

Prerequisites: MATH 97 or CCP 97 and ENGL 99 or higher or instructor permission

**PMFG 288 Cooperative Work  
Experience****1-15 credits**

Provides work-based learning experience in a specific program of study. Individualized student outcomes are developed, focusing on behaviors that contribute to workplace success.

Prerequisites: Instructor or Cooperative Education Coordinator permission

Concurrent requirements: COLL 289 or BUS 294 must be taken prior to or concurrent with this course.

**PMFG 299 Independent Study****1-10 credits**

Offers individualized learning opportunities for knowledge or skill development. Content and expectations are established between the student and instructor, and documented in an Independent Study contract.

Prerequisites: By instructor permission only.