Semiconductor Manufacturing Technology (SMT)

Courses

SMT 1101 Clean Room Operations and Lab: 2 semester hours.
This course provides an overview of clean room operations essential for semiconductor manufacturing. Students will learn the principles of contamination control, clean room design, and best practices for maintaining a controlled environment crucial for producing high-quality semiconductor devices. PREREQ: Minimum score of 30 on ALEKS or equivalent. S, F, Su

SMT 1117 Introduction to Industrial Thermal Systems: 2 semester hours.
Overview of common industrial thermal systems which includes: heat exchangers; boilers; chillers; evaporators; and heating, air conditioning and ventilation (HVAC) systems. Exploration of thermal energy sources and introduction to fundamental thermal energy transfer and calculations. PREREQ: Minimum score of 30 on ALEKS or equivalent. COREQ: SMT 1117L. S, F, Su

SMT 1117L Introduction to Industrial Thermal Systems Lab: 1 semester hour.
A laboratory experience that examines the different types and configurations of heat exchangers; boilers; chillers; and heating, air conditioning and ventilation (HVAC) systems. PREREQ: Minimum score of 30 on ALEKS or equivalent. COREQ: SMT 1117. S, F, Su

SMT 1118 Semiconductor Manufacturing Technician I: 1 semester hour.
An introduction to shop safety, craft related mathematics, industry related units of measure, technical drawings, modes of maintenance, simple machines, fasteners, lubrication, seals, and gaskets. PREREQ: Minimum score of 14 on ALEKS or equivalent. COREQ: SMT 1118L. F, S, Su

SMT 1118L Semiconductor Manufacturing Technician I Lab: 1 semester hour.
Application of shop safety; proper usage of tools; test and measurement devices; the ability to follow maintenance procedures; and the inspection, disassembly and assembly of industrial machines. PREREQ: Minimum score of 14 on ALEKS or equivalent. COREQ: SMT 1118. F, S, Su

SMT 1119 Semiconductor Manufacturing Technician II: 2 semester hours.
An introduction to pumps and drives, valves, piping components, millwright fundamentals, and fluid power. COREQ: SMT 1119L S, F, Su

SMT 1119L Semiconductor Manufacturing Technician II Lab: 1 semester hour.
Inspection, disassembly, assembly and installation of various types of pumps and valves. Preparation and joining of various types of piping and piping components. Basic leveling and alignment fundamentals of pumps and drive systems. Operation and testing of fluid power systems. COREQ: SMT 1119. S, F, Su

SMT 1121 Basic Electricity and Electronics: 4 semester hours.
Fundamental principles of electricity, Ohm's law, Kirchhoff's laws, and circuit analysis applied to DC and AC circuits. PREREQ: Minimum score of 30 on ALEKS or equivalent. COREQ: SMT 1121L. S, F, Su

SMT 1121L Basic Electricity Lab: 3 semester hours.
Basic principles of electrical measurement and testing of DC and AC circuits. PREREQ: Minimum score of 30 on ALEKS or equivalent. COREQ: SMT 1121. S, F, Su

SMT 1122 Electrical Systems and Motor Control Theory: 3 semester hours.
Introduction to electrical system distribution and basic motor control including two- and three-wire control using a variety of devices and motor magnetic controllers. Control relays, time relays, solenoid valves, latching relays, and motor control centers. PREREQ: SMT 1121 and SMT 1121L or permission of instructor. COREQ: SMT 1122L. S, F, Su

SMT 1122L Electrical Systems and Motor Control Theory Laboratory: 1 semester hour.
Applications of electrical systems and motor controls. PREREQ: SMT 1121 and SMT 1121L or permission of instructor. COREQ: SMT 1122. S, F, Su

SMT 1123 Mechanical Power Transmission I: 2 semester hours.
This course covers mechanical drives including chain-drives, belts, gears, and coupled shafts. Proper application and use of bearings, statics, hoists and fasteners are discussed. PREREQ: Minimum score of 14 on ALEKS or equivalent. Permission of instructor. COREQ: SMT 1123L. F, S, Su

SMT 1123L Mechanical Power Transmission Laboratory I: 2 semester hours.
This course covers the application of mechanical drives including chain-drives, belts, gears, and coupled shafts. Proper application and use of bearings, statics, hoists and fasteners are discussed. Students will apply safe work practices in an industrial setting. PREREQ: Minimum score of 14 on ALEKS or equivalent. Permission of instructor. COREQ: SMT 1123. F, S, Su

SMT 1127 Mechanical Power Transmission II: 2 semester hours.
Introduction to the following: machine dynamics, torque, kinematics, and vibration; stress, strain, and failures; lubrication and seals; and machine installation. COREQ: SMT 1127L. S, F, Su

SMT 1127L Mechanical Power Transmission Laboratory II: 2 semester hours.
Application and testing of machine dynamics, kinematics and lubrication. Project design, management and teamwork is covered. COREQ: SMT 1127. S, F, Su

SMT 1162 Industrial Safety and Regulations: 2 semester hours.
An orientation to industrial safety, hazard recognition, safety planning, regulatory standards, and best practices. S, F, Su

SMT 1184 Pneumatic and Vacuum Systems: 2 semester hours.
This course introduces students to the principles and applications of pneumatic and vacuum systems used in semiconductor manufacturing. Focusing on the design, operation, and maintenance of these critical systems, students will explore how pneumatic and vacuum technologies contribute to efficient fabrication processes. COREQ: SMT 1184L. S, F, Su

SMT 1184L Pneumatic and Vacuum Systems Lab: 1 semester hour.
Through guided projects, students will develop the skills necessary to operate, maintain, and troubleshoot fluid power systems, preparing them for careers in the semiconductor industry. COREQ: SMT 1184. S, F, Su

SMT 2201 Automated Control Systems: 2 semester hours.
This course provides a comprehensive introduction to the automated systems used in semiconductor manufacturing. Key topics include process automation, sensor technology, and the role of automation in improving efficiency and precision in semiconductor manufacturing. COREQ: SMT 2201L F, S, Su

SMT 2201L Automated Control Systems Lab: 1 semester hour.
This course emphasizes experiential learning, where students will work with simulation software and actual automation equipment to reinforce theoretical knowledge and enhance hands-on expertise, gaining practical skills in programming, system integration, and troubleshooting within a semiconductor environment. COREQ: SMT 2201 F, S, Su

SMT 2202 Radio Frequency Plasma: 3 semester hours.
This course covers the principles and applications of radio frequency (RF) plasma technology within semiconductor manufacturing. Students will explore the fundamental concepts of plasma physics, RF generation, and plasma processing techniques critical to the fabrication of semiconductor devices. F, S, Su

SMT 2203 Nanofabrication: 3 semester hours.
This course explores nanofabrication techniques essential for semiconductor manufacturing. Students will study the principles and methodologies involved in creating nanoscale structures and devices, focusing on both top-down and bottom-up approaches. F, S, Su

SMT 2242 Practical Process Measurements and Control: 2 semester hours.
This course explores the principles of temperature, pressure, level, and flow measurement. It covers techniques for computerized data acquisition, data analysis, and statistical precision and tolerance. Students will also examine industrial communication systems and process control operations. The course includes both lecture and hands-on laboratory work in selected topics, providing practical experience in the field. PREREQ: SMT 1122 or permission of instructor. S, F, Su