Robotic Maintenance .......................... 4 Credit Hours

English/ESL Placement: Placement into ENG 1060 or higher (or placement into ESL 2510 or higher for students taking the ESL sequence of courses).

Prerequisite: ROB 1500

This course is designed to give students a detailed knowledge of robotic mechanical units. The types of gears and gear reduction systems that are used in robots will be studied. Many aspects of robotic mechanical units will be observed, including mechanical adjustments and preventative maintenance. Controller setting and procedures which influence the motion of the robotic manipulator will be investigated. The safety procedures involved in working with robotic mechanical units will be emphasized. BILLABLE CONTACT HOURS: 5

Robotic Communications and Machine Vision .................................................. 4 Credit Hours

English/ESL Placement: Placement into ENG 1060 or higher (or placement into ESL 2510 or higher for students taking the ESL sequence of courses).

Prerequisite: ROB 1620

This course will give the student a working knowledge of the various types of industrial sensors incorporated into a complex work cell. The student will utilize point-to-point wiring interfaces, field device networks, and data networks to investigate how controllers are programmed to interact with the types of signals the sensors will supply to the controller. Concepts of machine vision lighting/lensing and programming will be studied and applied to robotic applications. Students will study the use of simulation in programming signal exchanges in robotics applications. BILLABLE CONTACT HOURS: 5
ROB 2040  Programmable Controller Applications  ......4 Credit Hours

**English/ESL Placement:** Placement into ENG 1060 or higher (or placement into ESL 2510 or higher for students taking the ESL sequence of courses).

This class will introduce the fundamentals of Programmable Logic Controller (PLC) operations, including symbology and programming techniques. PLC hardware and data structures will be presented. Methods of using the programming interface to troubleshoot applications will be emphasized. The student will write, enter, and execute application programs using the programmable controllers and Human Machine Interface (HMI). The use of the Robotics Lab equipment will give the student practical programming and troubleshooting skills used in the maintenance of automated systems. **BILLABLE CONTACT HOURS:** 5

ROB 2140  Advanced Programmable Controllers

**Applications**  ..........................................................4 Credit Hours

**English/ESL Placement:** Placement into ENG 1060 or higher (or placement into ESL 2510 or higher for students taking the ESL sequence of courses).

**Prerequisite:** ROB 2040

The course will be structured to provide the student with an understanding of the relationship between real time control systems and industrial devices and machines. The advanced instruction set of programmable controllers will be studied relevant to concepts and structures of automated control systems. Various applications will be defined in which the student will develop the written programs for each hardware and software specification of the process problems, including field devices, data networks, and Human Machine Interfaces (HMI). The use of the Robotics Lab equipment will give the student practical programming and troubleshooting skills used in the maintenance of automated systems. **BILLABLE CONTACT HOURS:** 4

ROB 2400  Robotic Automated Systems Applications  ......4 Credit Hours

**English/ESL Placement:** Placement into ENG 1060 or higher (or placement into ESL 2510 or higher for students taking the ESL sequence of courses).

**Prerequisite:** ROB 1640 and ROB 1660

This course provides the system aspects for applying robots in automation. Topics include the process requirements, programming, and communication for implementing robotic applications. The student will gain practical information on how these systems are interfaced together mechanically, electrically and software wise. Robotic simulation and machine vision sensors will be utilized by the students in robotic work cell applications. **BILLABLE CONTACT HOURS:** 4

ROB 2500  Robotic Controller Maintenance  ..........4 Credit Hours

**English/ESL Placement:** Placement into ENG 1060 or higher (or placement into ESL 2510 or higher for students taking the ESL sequence of courses).

**Prerequisite:** ROB 1500 or consent of instructor.

This course will cover the maintenance aspect of robot controllers. Students will study the techniques and components involved in maintenance including: controller settings; electrical/electronic architecture; analysis and troubleshooting techniques of robot controllers. Students will utilize observations, documentation, and prints to diagnose and correct problems on the robotic controllers. **BILLABLE CONTACT HOURS:** 5