

INDA - Industrial Automation Courses

INDA B100 Industrial Design Graphics I

3 units

Prerequisites: Successful completion of INDR B12 with a grade of C or better and admission to Industrial Automation Bachelor's Degree program.

Description: The application of two-dimensional industrial design techniques (sketching, drafting, and Computer Aided Drafting) taught within the context of automation and process design. Students will gain design and management skills while generating process flow diagrams (PFD's), piping & instrumentation diagrams (P&ID's), and control panel layouts.

Hours: 36 lecture, 54 lab

Transferable: Bachelor's Degree Applicable; Career and Technical Education (CTE)

INDA B105 Materials Science for the Technician

3 units

Prerequisites: Successful completion of PHYS B2A or PHYS B4A and MATH B1A OR MATH B2 OR MATH B6A with a grade of C or better and admission to Industrial Automation Bachelor's Degree program.

Description: An introduction to materials science for technicians and technologists. Topics to be presented include atomic structure of materials, electrical and mechanical properties, properties testing, basic metallurgy, corrosion and wear, and materials selection. Materials covered include ceramics, polymers and composites, steels, and nonferrous metal alloys. Students will also be introduced to processes including heat treatment, surface treatments, polymer manufacturing, and composite fabrication.

Hours: 36 lecture, 54 lab

Transferable: Bachelor's Degree Applicable; Career and Technical Education (CTE)

INDA B110 Industrial Automation Networks

3 units

Prerequisites: Successful completion of ELET B58 and ELET B61 with a grade of C or better and admission to Industrial Automation Bachelor's Degree program.

Description: The basic theory and implementation of industrial automation networks, including digital data, industrial control networks, instrumentation and process control bus and network standards, SCADA (Supervisory Control and Data Acquisition) and DCS (Distributed Control Systems), and essentials of human-machine interface (HMI) panels connection, programming, and modification of programs and features.

Hours: 36 lecture, 54 lab

Transferable: Bachelor's Degree Applicable; Career and Technical Education (CTE)

INDA B114 Industrial Safety Principles and Management

3 units

Prerequisites: Admission to Industrial Automation Bachelor's Degree program

Description: An overview of components of successful safety and industry hygiene programs, best practices, OSHA reporting requirements, legal and ethical obligations of both employer and employee, principles of safety management, assessment of hazards associated with various industrial processes and facilities, and protective measures used to minimize hazards such as personal protective equipment, hazard management, education and training options, and incentive programs.

Hours: 54 lecture

Transferable: Bachelor's Degree Applicable; Career and Technical Education (CTE)

INDA B120 Industrial Automation Systems - Robotics

3 units

Prerequisites: Successful completion of ELET B4 with a grade of C or better and admission to Industrial Automation Bachelor's Degree program.

Description: A study of industrial automation systems, including principles of robotics, power supplies and movement systems, sensing and end-of-arm tooling, and control systems and maintenance.

Hours: 36 lecture, 54 lab

Transferable: Bachelor's Degree Applicable; Career and Technical Education (CTE)

INDA B122 Applied Methods of Motion and Process Control

3 units

Prerequisites: Successful completion of ELET B55 or ELET B55a and ELET B56 with a grade of C or better and admission to Industrial Automation Bachelor's Degree program.

Description: Methods of implementing and documenting industrial instrumentation and control for use in process and motion control. Implementation of controller operations using stand-alone PID (proportional integral derivative) controllers and PLC (programmable logic controllers) including topics such as single and dual loop controller tuning, basic process control strategies, and process safety. Applications of instrumentation will focus on selection, connection, and calibration of industrial sensors and signaling methods. Measurement parameters will include, pressure, flow, temperature, level, distance, Ph (potential of hydrogen), RPM (revolution per minute), linear and angular velocity, and position. Applications of control will include Variable Frequency Drives (VFD), electric, pneumatic, and hydrologic actuators, and their application with control valves, motors, and servos for use in process and motion control. Students will research product data sheets and create documentation that cover topics such as process flow diagrams, P&ID's, loop diagrams, operation and troubleshooting procedures. Lab activities will be provided with actual equipment and software used in industry.

Hours: 36 lecture, 54 lab

Transferable: Bachelor's Degree Applicable; Career and Technical Education (CTE)

INDA B125 Operations Management in the Automation Field

3 units

Prerequisite: Admission to Industrial Automation Bachelor's Degree program

Description: An Introduction to Operations Management and study of automation processes. Students will analyze and improve business processes in services and manufacturing, learning how to increase productivity and deliver high quality standards. Key concepts include process analysis, bottlenecks, flows rates, and inventory levels.

Hours: 54 lecture

Transferable: Bachelor's Degree Applicable; Career and Technical Education (CTE)

INDA B132 Project Management*3 units***Prerequisites:** Admission to Industrial Automation Bachelor's Degree program**Description:** This course provides hard information and skills to work successfully in a project environment and to accomplish project objectives. It will equip students by explaining concepts and techniques and by using numerous examples to show how they can be skillfully applied. Topics covered in this course include project management life cycle and process; identifying and selecting projects; developing a project proposal; techniques for planning, scheduling, resource assignment, budgeting, and controlling project performance; project risks; project manager responsibilities and skills; project team development and effectiveness; project communication and documentation; and project management organizational structures. The concepts in the course support the project management knowledge areas of the Project Management Institute's A Guide to the Project Management Body of Knowledge (PMBOK® Guide).**Hours:** 54 lecture**Transferable:** Bachelor's Degree Applicable; Career and Technical Education (CTE)**INDA B135 Economic Decision Making***3 units***Prerequisite:** Admission to Industrial Automation Bachelor's Degree program**Description:** A study of the methodologies for estimating and forecasting product and service costs. Topics include labor and material cost analysis; accounting analysis including financial statements, depreciation, budgeting, and overhead allocation; forecasting techniques; general cost estimating methods; operations estimating and analysis; product cost estimating, and breakeven models**Hours:** 54 lecture**Transferable:** Bachelor's Degree Applicable; Career and Technical Education (CTE)**INDA B140 Quality Management***3 units***Prerequisites:** Admission to Industrial Automation Bachelor's Degree program**Description:** An overview of the various methods of quality assurance (the systematic process of determining whether products meet customers' expectations), quality control (the systematic process of determining the quality and consistency of products), and efficient manufacturing processes (using techniques that determine the most efficient method of manufacturing and logistics). Strategies such as Six-Sigma, Lean Manufacturing, Failure Mode Analysis, ISO 9001, and various continuous improvement programs will be examined.**Hours:** 54 lecture**Transferable:** Bachelor's Degree Applicable; Career and Technical Education (CTE)**INDA B143 Materials and Maintenance Management***3 units***Prerequisite:** Admission to Industrial Automation Bachelor's Degree program**Description:** Principles and practices of maintenance department organization, prevention procedures, and typical equipment problems. Includes related topics such as plant protection, preventative and plant maintenance. Analytical methods used to

support inventory replenishment for the production of goods and services.

Hours: 54 lecture**Transferable:** Bachelor's Degree Applicable; Career and Technical Education (CTE)**INDA B144 Leadership***3 units***Prerequisites:** Admission to Industrial Automation Bachelor's Degree program**Description:** Fundamental historical basis of ethics and character are studied with emphasis on the origin of the factors that many cultures derive their ethical standards. Relationship of how these standards relate to operations management and business. The characteristics of leadership and the ethical qualities that make a person an effective leader in today's business and industrial environment are analyzed. The laws of leadership and examples that specific leaders exhibit these laws are discussed with emphasis on individual growth as a leader in today's market.**Hours:** 54 lecture**Transferable:** Bachelor's Degree Applicable; Career and Technical Education (CTE)**INDA B150 Systems Design and Integration (Senior Project)***3 units***Prerequisites:** Admission to Industrial Automation Bachelor's Degree program and successful completion of INDA B132 with a grade of C or better.**Description:** Students will work in teams to design, plan for production, and integrate various automation technologies into the production of a simple product; or partner with industry members to analyze and provide recommendations for actual problems.**Hours:** 9 lecture, 135 lab**Transferable:** Bachelor's Degree Applicable; Career and Technical Education (CTE)