

**HUMANITIES****HUMA-238 Leadership & Group Dynamics 3 cr.**

Designed to provide a basic understanding of leadership and group dynamics to help the student develop a personal philosophy of leadership and an awareness of the moral and ethical responsibilities of leadership. Students will engage in a variety of experiential learning exercises in order to develop leadership skills. Also listed as BADM 238. Offered: On Demand.

**INSTRUMENTATION AND CONTROLS TECHNOLOGY****INST-140 Applied Basic DC Circuits 3 cr.**

Introduction to electrical fundamentals, energy sources, Ohm's law, series, parallel, and series-parallel circuit analysis, Kirchoff's law. Use of digital multimeters and other electronics instruments will be examined. Prerequisites: Completion of MATH-096 or appropriate Math Accuplacer score. Offered: All. Faculty Permission Required.

**INST-144 National Electric Code 3 cr.**

This course offers an introduction to the National Electrical Code with a focus on the general portion of the code up to sections 100-400, plus 900. Corequisites: INST-145 or Instructor Permission. Offered: Fall and Spring.

**INST-145 Applied Basic AC Circuits 3 cr.**

Alternating current theory to include impedance, capacitive reactance, and inductive reactance in series, parallel, and series-parallel combination, resonance and impedance in RLC circuits. Prerequisites: INST-140. Corequisites: MATH-113 or MATH-115 or MATH-185. Offered: All.

**INST-160 Digital Electronics 5 cr.**

An introduction to combinational and sequential logic circuits, logic gates, Data Bus Control, binary codes, analog to digital and digital to analog conversions. Theory is tested using Field Programmable Gate Arrays (FPGA). Prerequisites: INST-140. Offered: Spring.

**INST-171 Motors and Controls 5 cr.**

This course offers an introduction to motors and motor controls. Various kinds of AC/DC machines will be investigated including AC motors and alternator, as well as DC motors and generators. Prerequisites: INST-145. Offered: Fall & Spring.

**INST-175 Renewable Energy Instrumentation 3 cr.**

An introduction to the basic principles of instrumentation and control for renewable energy applications. Includes techniques for measuring mechanical, thermal and electrical quantities. Corequisites: INST-145. Offered: Fall.

**INST-180 Semiconductor Circuits 5 cr.**

An introduction to semiconductor devices, semiconductor theory, characteristic curves, diodes, zener diodes, bipolar transistors, thyristors and op-amps. Prerequisites: INST-145. Offered: Fall.

**INST-190 Principles of Industrial Measurement 5 cr.**

An introduction to the basic principles of process measurement, including techniques for the measurement of flow, level,

temperature, pressure, and analytical process variables.

Prerequisites: INST-140. Offered: Fall & Spring.

**INST-215 Renewable Energy AC and DC Machines 3 cr.**

This course offers an introduction to DC motors and generators, and AC motors and alternators. Also covered in the program; principles of operation, motor controls, wiring, and testing. Prerequisites: INST-145. Offered: Spring.

**INST-220 Process Control 5 cr.**

Introduction to automatic process control systems that includes tuning: Feed forward, Feedback and Cascade loops. Also covers calibration of valves, positioners and actuators. Prerequisites: INST-190. Offered: Spring & Summer.

**INST-235 ElectroMechanical Devices 5 cr.**

Covers theory and applications of electro-mechanical devices and their associated control circuits. Topics include transducers, pneumatics, and AC motor and controls. Prerequisites: INST-145. Offered: All.

**INST-265 Industrial Wiring 4 cr.**

This course is designed to develop a student's understanding and skills in the installation and wiring of industrial electrical equipment, in compliance with the National Electric Code. Prerequisites: INST-144, INST-235. Offered: Fall & Spring.

**INST-271 PLC Applications 5 cr.**

Introduction to Programmable Logic Controller (PLC) functions including digital and analog applications. Prerequisites: INST-160. Offered: Fall.

**INST-284 Print Interpretation 3 cr.**

This course covers industrial prints and schematics as used in the industry. Also covered are the basic fundamentals of pumps and compressors. Prerequisites: INST-190, INST-235. Offered: Spring.

**INDUSTRIAL PROCESS OPERATOR****IPOP-110 Intro to Process Technology 4 cr.**

Introduces students to energy plant operations. Topics include: Process technician duties, responsibilities and expectations, plant organizations, industrial economics, plant process and utility systems, and the physical and mental requirements of the process technician. Corequisites: IPOP-130, IPOP-133. Offered: Fall. Faculty Permission Required.

**IPOP-130 Safety, Health & Environment 4 cr.**

Develop knowledge and skills to reinforce the attitudes and behaviors required for safe and environmentally sound work habits. There will be an emphasis on safety, health and environmental issues in the performance of all job tasks and regulatory compliance issues. Corequisites: IPOP-110, IPOP-133. Offered: Fall. Faculty Permission Required.

**IPOP-133 Process Technology I-Equipment 4 cr.**

Instructs students on the usage of common process equipment. The student will use appropriate terminology and identify process equipment components such as piping and tubing, valves, pumps, compressors, turbines, motors and engines, heat exchangers, cooling towers, heaters and furnaces, boilers, filters and dryers,

and vessels. Included are the basic functions, scientific principles and symbols. Students will identify components on typical Process Flow Diagrams and Piping and Instrument Diagrams. Corequisites: IPOP-110, IPOP-130. Offered: Fall. Faculty Permission Required.

**IPOP-135 Maintenance Overview for Operators 4 cr.** Introduces the maintenance of equipment that utilizes mechanical, electrical and instrumentation concepts. Topics include: hand tools, bearing fundamentals, equipment lubrication, material handling, electrical safety, battery systems, diagrams, electrical production and distribution, transformers, breakers, switches, AC and DC motors, motor controllers and operations, and introduction to automation and instrumentation. Prerequisites: IPOP-110, IPOP-130, and IPOP-133. Corequisites: IPOP-160, IPOP-165. Offered: Spring. Faculty Permission Required.

**IPOP-160 Intro to Instrumentation 4 cr.** Covers the varied instruments and instrument systems used in the process industry. This includes process variables, elements and instruments of pressure, level, flow, temperature and analytical devices, control loops, controllers, final control elements, Process Flow Diagrams, Piping and Instrumentation Diagrams and instrumentation troubleshooting. Prerequisites: IPOP-110, IPOP-130, and IPOP-133. Corequisites: IPOP-135, IPOP-165. Offered: Spring. Faculty Permission Required.

**IPOP-165 Process Technology II-Systems 4 cr.** Study the interrelation of process equipment and process systems. This includes related scientific principles as applied to power generation, refinery operations and gas processing with a focus on manual operation. The student will arrange process equipment into basic systems; describe the purpose and function of specific process systems; explain how factors affecting process systems are controlled under normal conditions, and recognize abnormal process conditions. Prerequisites: IPOP-110, IPOP-130, and IPOP-133. Corequisites: IPOP-135, IPOP-160. Offered: Spring. Faculty Permission Required.

**IPOP-235 Process Technology III-Ops 4 cr.** Continuing from IPOP 165 Process Systems I, this second semester course will deal in more complex process systems and their interdependency with a focus on automatic control. Students will be introduced to the use of Programmable Logic Controllers and Distributed Control Systems as they apply to refinery, gas plant and power plant operations. Prerequisites: IPOP-135, IPOP-160, and IPOP-165. Corequisites: IPOP-261, IPOP-262. Offered: Fall. Faculty Permission Required.

**IPOP-261 Distributed Control Systems 4 cr.** Teaches students to perform typical control room operational procedures. Students will learn to operate the Distributed Control System through the use of graphical displays that reflect process conditions. The student will recognize, acknowledge and respond to process alarms. The student will use trends displays to observe variations in process conditions and review historical data. Prerequisites: IPOP-135, IPOP-160, and IPOP-165. Corequisites: IPOP-235, IPOP-262. Offered: Fall. Faculty Permission Required.

**IPOP-262 Process Troubleshooting Systems 4 cr.** Instructs the student in the different types of troubleshooting techniques, procedures, and methods that are used to solve process problems. Topics include application of data collection and analysis, cause-effect relationships, and reasoning. The student will explain steps in troubleshooting models; demonstrate the use of troubleshooting tools; and apply troubleshooting techniques to process problems. Prerequisites: IPOP-135, IPOP-160, and IPOP-165. Corequisites: IPOP-235, IPOP-261. Offered: Fall. Faculty Permission Required.

**IPOP-263 Gas Processing & Refining 4 cr.** Study of the major processes used in the gas processing industry. Included are amine sweetening, cryogenic liquids extraction, refrigeration, absorption, dehydration, sulfur recovery, compression, liquids handling, storage and transportation and the major regulatory programs that impact the gas processing industry. Petroleum Refining topics include physical and chemical properties of petroleum products, introduction to major modern refining processes, and operational technology for refining processes. Prerequisites: IPOP-235, IPOP-261, and IPOP-262. Corequisites: IPOP-264, IPOP-265. Offered: Spring. Faculty Permission Required.

**IPOP-264 Environmental Processes 4 cr.** Prepares the student for the various environmental process systems. These include but are not limited to the environment, water pollution and air pollution control equipment and treatment. Introduction to boiler water treatment, raw water treatment cooling water treatment, and ion exchange will be covered. The student will also learn about fuel and combustion characteristics, coal, oil and gas handling and flame characteristics and as handling. Prerequisites: IPOP-235, IPOP-261, and IPOP-262. Corequisites: IPOP-263, IPOP-265. Offered: Spring. Faculty Permission Required.

**IPOP-265 Electrical Power Generation 4 cr.** Introduces the student to the process of generating electricity. Students will summarize electrical distribution systems, power generation, boiler operation and combustion control. They will also be familiarized with fuel systems and fuel preparation equipment as well as the process and support flows related to large industrial turbines, generators, exciters, boilers, water and steam, fuel gases and environmental control equipment. The student will also measure process and component efficiencies and heat rate. Prerequisites: IPOP-235, IPOP-261, and IPOP-262. Corequisites: IPOP-263, IPOP-264. Offered: Spring. Faculty Permission Required.

## JOURNALISM

**JOUR-220 Writing for Mass Media 3 cr.** Emphasizes writing techniques for print and electronic media. Forms, style, and brevity are stressed. Offered: Fall.

## LEGAL ASSISTANT

**LEAS-120 Introduction for Paralegals 3 cr.** An introduction to the role of the paralegal including such topics as regulation of the legal profession, legal ethics, law office management, human relations skills, legal terminology, techniques