



MASTER COURSE OUTLINE

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COURSE TITLE

Introduction to Mechanized Irrigation Applications I

GENERAL COURSE INFORMATION

Dept.: IST

Course Num: 141

(Formerly:)

CIP Code: 47.0101

Intent Code: 21

Program Code: 780

Credits: 5

Total Contact Hrs Per Qtr.: 77

Lecture Hrs: 27.5

Lab Hrs: 55

Other Hrs:

Distribution Designation:

COURSE DESCRIPTION (as it will appear in the catalog)

This class will introduce the history and development of mechanized irrigation. It will distinguish the basic irrigation systems: pivot, swing arm corner, and lateral move systems. Course work will examine the various propulsion systems, electrical/electronic/digital logic controls and irrigation hydraulic principles. It will focus on technical service and operation aspects in a "real-life" lab environment under actual conditions.

PREREQUISITES

IST101 and IST 102 or Instructor Permission

TEXTBOOK GUIDELINES

Appropriate textbook as determined by faculty (Example: Reference materials from Valmont, Lindsay and Reinke)

COURSE LEARNING OUTCOMES

Upon successful completion of the course, students should be able to demonstrate the following knowledge or skills.

1. Understand the differences in types of systems (pivot, swing arm corner, and lateral move).
2. Explain the fundamental operation of each of the systems types using proper industry nomenclature.
3. Relate the electrical components utilized on the irrigation systems to those found in other industrial applications.
4. Perform fundamental electrical diagnostic troubleshooting at the system and component level.
5. Demonstrate a practical knowledge of pumping hydraulic principles and use of pumping curves

INSTITUTIONAL OUTCOMES

COURSE CONTENT OUTLINE

- 1) History of mechanized irrigation and its application in modern agriculture and industry.
 - a) Brief history
 - b) Applications
 - i. Irrigation
 - ii. Approved dispersal of processing water from various food processing applications
 - iii. Approved dispersal of treated waste water from municipalities or livestock operations

- 2) Mechanized irrigation system types
 - a) Pivot system
 - b) Swing arm corner system
 - c) Lateral (or linear) move system
- 3) Theory of operation
 - a) Pivot
 - i. Structural components
 - 1. Pivot center
 - 2. Spans
 - 3. Towers
 - 4. End booms
 - 5. End guns
- 4) Water handling Hydraulics
 - a) Pumping curves
 - b) Pumping efficiency
 - c) Liquid pressure & flow dynamics
- 5) Technician safety
 - a) Environmental considerations
 - b) System grounding

DEPARTMENTAL GUIDELINES *(optional)*

DIVISION CHAIR APPROVAL

DATE