AGTC 220: IRRIGATION PUMPS

Proposer:

Name:	Email:
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Effective Term:
Fall 2024

Credit Status:
Credit - Degree Applicable

Subject:
AGTC - Agricultural Technology

Course Number:
220

Catalog Title
Irrigation Pumps

Catalog Description
This course focuses on irrigation pumps. Students will learn about the different types of irrigation pumps used in the agriculture industry. Pump curves and pump selection will be covered utilizing crop water requirements and irrigation design specifications. Students will learn about pump efficiency by conduction efficiency tests both in a lab setting and out in the field. Electrical energy efficiency as it relates to pumping will be discussed.

Method of Instruction:
Distance Education
Laboratory
Lecture and/or Discussion

Course Units/Hours:

Course Units Minimum:
3

Lecture Hours Minimum (week)
3

Lab Hours Minimum (week)
1

Total Contact Hours Minimum (semester)
70

Total Outside Hours Minimum (semester)
105

Total Student Learning Minimum Hours (semester)
175

Repeatability:
No

Open Entry/Exit:
No

Field Trips:
Not Required

Grade Mode:
Standard Letter

TOP Code:
011600 - * Agricultural Power Equipment Technology

SAM Code:
C - Clearly Occupational

Course Content

Methods of Assessment:
Oral presentations
Problem solving assignments or activities
Problem solving quizzes or exams
Project
Short answer quizzes or exams
Skill demonstrations

Course Topics:

	Course Topics
1	Pump system types and components
2	Sump design
3	Variable speed operation
4	Pump Evaluation and Data Collection
5	Pump curves and pump selection
6	Drive units and measurement
7	Pumping hydraulics and measurement
8	Net Positive Suction Head
9	Pumping Plant Maintenance

Course Objectives:

	Course Objectives
1	Compare and contrast different pumping systems and discuss the advantage and disadvantage of each.
2	Use crop water requirement, pump efficiency and energy cost data, to calculate yearly pumping costs for both electric motor and engine driven units.
3	Use a manufacturer's pump curve to identify specific pump parameters and explain how each of the parameters affect overall pumping efficiency.
4	Complete the documents required to obtain a government permit for the installation of a new well.
5	Identify different pump components and discuss their functions.
6	Discuss the advantages and disadvantages of electrical frequency drives and specify an appropriate unit for a given scenario.
7	Analyze a specific pumping situation and specify an appropriate pump to meet crop needs.
8	Identify various impeller styles and materials and discuss the advantage and disadvantages of each; select the best impeller for a given situation.

Course Outcomes:

	Course Outcomes
1	Students will be able to interpret information from a pump curve.
2	Students will be given a physical scenario and be able to select a pump that best fits that situation.
3	Students will be given a physical situation and create an irrigation budget from the situation.

Assignments:

Assignment Type:	Details
Reading	Students may have to read manufacturers literature on pump design and installation parameters.
Writing	Students may have to write a recommendation on a pump application based on capacity, total dynamic head and net positive suction head.
Homework	Students may need to answer questions from a video or reading assignment.
Lab	Students may have to collect necessary data to create a pump evaluation.

Textbooks or other support materials

Resource Type:	Details
Books	Pumps and Pumping Systems Robert D. von Bernuth, Irrigation Association October 2015

Equity Review:

Yes

Other Degree Attributes

Degree Applicable
Not Transferable
Not a Basic Skills Course

Distance Learning Addendum

DLA-Approved-May-13-2020-fillable-form.pdf

Banner Title:

Irrigation Pumps

Curriculum Committee Approval Date:

09/06/2023

Academic Senate Approval Date:

09/13/2023

District Governing Board Approval Date:

10/09/2023

Course Control Number:

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