J.S. University, Shikohabad

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VALUE ADDED COURSE

Efficient Water Management for Crop Production with Irrigation and Drainage Engineering

Faculty of Agricultural Sciences

	J.S. University, Shikohabad Faculty of Agricultural Sciences	Value Added Course
		AGVAC-05

Efficient Water Management for Crop Production with Irrigation and Drainage Engineering

Course Overview: This course aims to provide learners with an understanding of irrigation and drainage engineering principles and practices for efficient water management in crop production. Through lectures, case studies, and hands-on activities, learners will develop skills in designing and implementing irrigation and drainage systems that optimize water use and crop productivity while minimizing environmental impacts.

Course Outcomes: Upon completion of this course, learners will be able to:

1. Understand the principles and concepts of irrigation and drainage engineering, including water movement in soils and crop water requirements.
2. Design and evaluate irrigation and drainage systems for crop production, including sprinkler, drip, and flood systems.
3. Apply knowledge of water management technologies and practices, including soil moisture sensors and evapotranspiration modeling, to improve water use efficiency.
4. Identify and assess the environmental impacts of irrigation and drainage systems, and design strategies to mitigate them.
5. Understand the social, economic, and policy factors that influence irrigation and drainage management, and apply this knowledge to develop sustainable water management plans.

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Course Outline:

Module 1: Introduction to Irrigation and Drainage Engineering

- Importance of efficient water management in crop production
- Basic concepts of soil-water-plant relationships
- Types of irrigation and drainage systems

Module 2: Irrigation and Drainage System Design and Evaluation

- Design principles and criteria for irrigation and drainage systems
- Performance evaluation and optimization of irrigation and drainage systems
- Case studies of successful irrigation and drainage systems

Module 3: Water Management Technologies and Practices

- Soil moisture sensing and control technologies
- Evapotranspiration modeling and water balance analysis
- Water use efficiency improvement strategies

Module 4: Environmental Impacts of Irrigation and Drainage Systems

- Environmental impacts of irrigation and drainage systems, including waterlogging, salinization, and pollution
- Strategies to mitigate the environmental impacts of irrigation and drainage systems
- Case studies of successful environmental management of irrigation and drainage systems

Module 5: Social, Economic, and Policy Aspects of Irrigation and Drainage Management

- Social and economic impacts of irrigation and drainage systems on rural communities
- Policy and institutional frameworks for sustainable water management
- Sustainable water management planning and implementation

Assessment:

- Quizzes and assignments will be given at the end of each module to test learners' understanding of the concepts covered.
- A final project will require learners to design an irrigation or drainage system for a specific crop or ecosystem.

Course Duration: This course is designed to be completed in 8 weeks, with approximately 4 hours of study per week.

Book References:

1. Irrigation Engineering by P.N. Modi and S.M. Seth
2. Irrigation and Water Resources Engineering by G.L. Asawa
3. Drainage Engineering by L. M. Krezel
4. Irrigation Water Management: Principles and Practice by Amarjit Singh and Megh R. Goyal

1. Sustainable Irrigation Management, Technologies and Policies II by M. Ramón Llamas and Enric Vázquez-Suñé

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