

AG415 Micro Irrigation System Design

Course Description & Objectives:

To expose the student to the fundamental knowledge in micro irrigation systems used in irrigation of crops with the design concepts of micro-irrigation systems like drip irrigation, Sprinkler irrigation with fertilization application.

Course Outcomes:

On completion of course the student will:

1. get the knowledge on micro irrigation concepts.
2. be able to understand the design concepts related to sprinkler irrigation and drip irrigation.
3. be able to suitably select and adopt different irrigation systems according to water requirement.

Unit 1: Introduction to Micro Irrigation:

Past, present and future need of micro irrigation systems, Role of Govt. for the promotion of micro irrigation in India, Merits and demerits of micro irrigation system,

Unit II: Types and Design of Micro Irrigation:

Types and components of micro irrigation system, Micro irrigation system design, installation, and maintenance. Sprinkler irrigation types, planning factors, uniformity and efficiency, laying pipeline, hydraulic lateral, sub mains and main line design, pump and power unit selection.

Unit III: Drip Irrigation:

Drip irrigation – potential, automation, crops suitability. Fertigation – Fertilizer application criteria, suitability of fertilizer compounds, fertilizer mixing, injection duration, rate and frequency, capacity of fertilizer tank.

Unit IV: Micro Irrigation and Poly House:

Quality control in micro irrigation components, design and maintenance of polyhouse, importance and application of polyhouse

Unit V: Development of Waste Land:

Prospects of waste land development –hills, semi arid, coastal areas, water scarce areas, Benefit and Cost analysis.

TEXT BOOKS:

1. Israelson and Hassan. (1981). *Irrigation Principles and Practices*. John Wiley and sons, New York.
2. Lal, R. (1983). *Irrigation Hydraulics*. Saroj Prakashan Publishers, Allahabad.

REFERENCES:

1. Larry, G.J. (1982). *Principles of Farm Irrigation System Design*. John Wiley Sons, New York.
2. Michael, A.M. (1986). *Irrigation Theory and Practice*. Vikas Publishing House, New Delhi.
3. Sivanappan, R.K. (1987). *Sprinkler irrigation*. Oxford & IBH Publishing Company, New Delhi.
4. Jack, K. and Rend, B. (2007). *Sprinkler and Trickle Irrigation*. Van Nostra Reinhold, New York.
5. Cuenca, H.R. (1989). *Irrigation System Design An Engineering Approach*. Prentice Hall, Engle wood, Cliffs, New Jersey.