

**TEXT BOOKS:**

1. Dharani. S and Venkata Krishnan. (1990). *Operations Research Principles & Problems*. Keerthi Publishing homes Pvt. Ltd.
2. Gupta, P.K. and Man Mohan. (1994). *Problems in Operations Research*. Sultan chand & sons, New Delhi.

**REFERENCES:**

1. Kapoor, V.K. (1994). *Operations Research*. Sultan chand & sons, New Delhi.
2. [http://ecourses.iasri.res.in/e-Learningdownload3\\_new.aspx?Degree\\_Id=04](http://ecourses.iasri.res.in/e-Learningdownload3_new.aspx?Degree_Id=04)
3. <https://www.coursera.org/course/introse>

IV Year II - Semester

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**AG414 Reservoir and Farm Pond Design****Course Description & Objectives:**

To introduce the students with reservoir and farm pond design systems for agriculture watershed.

**Course Outcomes:**

At the completion of the course the student will:

1. have knowledge and skills on planning, design, operation and management of reservoir system
2. have knowledge on planning, and management of and farm pond systems.
3. be exposed to different techniques to analysis different hydrological and metrology data
4. understand requirements of seepage line, drainage filters and pipings.
5. have knowledge on failure of earthen embankments and its prevention.

**Unit 1: Introduction to Earthen Embankments:**

Earthen embankments functions, advantages and disadvantages, classification – hydraulic fill and rolled fill dams homogeneous, zoned and diaphragm type;

**Unit II: Seepage Estimation:**

Foundation requirements, grouting, seepage through dams estimation of seepage discharge, location of seepage/phreatic line by graphical and analytical methods, flow net and its properties

**Unit III: Seepage Characteristics:**

Seepage pressure, seepage line in composite earth embankments, drainage filters, piping and its causes

**Unit IV: Design and Construction of Earthen Embankments:**

Design and construction of earthen dam, stability of earthen embankments against failure by tension, overturning, sliding etc; stability of slopes analysis of failure by slice method

**Unit V: Reservoirs and Farm Ponds:**

Types of reservoirs and farm ponds, design and estimation of earth work; cost analysis.

**TEXT BOOKS:**

1. Suresh, R. (1997). *Soil and water Conservation Engineering*. Standard Publishers and Distributors. Ludhiana.
2. Murty, V. V. N. (1998). *Land and Water management Engineering* (2 ed.). Kalyani Publishers.

**REFERENCES:**

1. ICAR. (1971). *Soil and Water Conservation Research in India*.
2. Punmia, B.C. (1981). *Soil Mechanics and Foundations*. Standard Book House, Delhi.
3. Schwab, G.O, Frevert, R.K., Edminister T.W., and Barnes, K.K. (1993). *Soil and water conservation engineering*. John Wiley and sons.
4. Alam Singh and Chowdhary, G. R. (1997). *Soil Engineering – in Theory and Practice. Part 3*. CBS Publishers and Distributors. New Delhi.
5. Bowles, Joseph. E. (1984). *Soil Mechanics and Foundation Engineering*. Mc Graw – Hill International Book Company.
6. Singh, G., Venkataraman, C., Sastri, C., Joshi, B.P. (1985). *Manual of Soil Water conservation practices*. Oxford IBM Publishing Co Pvt.Ltd. New Delhi.