

IV Year I - Semester

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AG417 Systems Engineering

Course Description & Objectives:

The student will expose different techniques of systems engineering of mathematic which are used in water resources engineering, food engineering and farm machinery.

Course Outcomes:

The course will enable the students to:

1. focus on defining customer needs and required functionality early in the development cycle
2. proceed with design synthesis and system validation while considering the complete problem including operations, performance, test, manufacturing, cost, and schedule.
3. link systems engineering to fundamentals of decision theory, statistics, and optimization.
4. introduce the most current, commercially successful techniques for systems engineering

Unit 1: System concepts:

System concepts. Requirements for a Linear programming problems. Mathematical Formulation of Linear Programming problems and its Graphical solution.

Unit II: Response of Systems:

Response of Systems. Computer as a tool in system analysis. Simplex method. Degeneracy and Duality in Linear programming. Artificial variable techniques, Big M method and two phase methods.

Unit III: Mathematical models:

Mathematical models of physical systems. Modelling of Agricultural Systems and operations. Cost analysis.

Unit IV: Methodologies of management:

Transportation problems. Assignment problems. Waiting line problems;

Unit V: Project Management:

Project management by PERT/CPM. Resource scheduling.

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-Leaarningdownload3_new.aspx?Degree_Id=04
3. <https://www.coursera.org/course/introse>