

Ambo University, Woliso Campus
School of Business and Economics
Department of Agricultural Economics

Semester:II Course number:AgEc2082 Course title: Operations Research in Agricultural Economics

Credits: 3 **Instructor:** Jima D.

Contents

Chapter 1: Introduction

- Development of operation research
- Definitions and scope of operations research
- Overview of the operations research modeling approach

Chapter 2: Linear Programming

- Basic Concepts in Linear Programming
- Formulations of LPP
- Assumptions of linear programming
- Methods of Solving LP
 - ✓ The Graphic Method
 - ✓ The Simplex Method
 - ✓ Tie Breaking in simplex method
 - ✓ The artificial variable (The Big M) technique
 - ✓ Minimization

Chapter 3: Duality theory and sensitivity analysis in linear programming

- ✓ The essence of Duality theory
- ✓ Economic interpretation of Duality
- ✓ Primal-Dual relationship
- ✓ The role of duality theory in sensitivity analysis
- ✓ Sensitivity analysis

Chapter 4: Integer Programming

- Need For Integer Programming
- Gomory's Fractional Method
- Branch- and- Bound Method

Chapter 5: Special types of linear programming

- ❖ Transportation problem
 - ✓ Formulation/construction of the model
 - ✓ Methods of solving Transportation problems
 - ✓ Special Cases in Transportation problem
- ❖ Assignment problem
 - ✓ Formulation/construction of the model
 - ✓ Methods of solving assignment problems
 - ✓ Special cases in assignment problems

Chapter 6: Network Analysis with CPM and PERT

- Basic concepts on net work
- The critical path method (CPM)
- Program evaluation and review technique (PERT)

Evaluation

Test one	15%
Quiz-1	5%
Test two	15%
Quiz-2	5%
Assignment	20%
Final exam	40%

References

J.K. Sharma, 1977. Operation Research, Theory and Application. Macmillan, New Delhi.

Hiller and Lieberman, 1986. Introduction to Operations Research, 4th ed.

Hamdy. A. Taha, 2007. Operation Research-An introduction, 8th ed. Prentice Hall, New Jersey

P.K Gupta and D.S Hira, 2007. Operations Research. Revised and enlarged edition 2007

F.S. Hiller and G.J. Lieberman: Introduction to Operations Research-Concepts and Cases, 9th Edition, Tata McGraw, 2010.

R.K. Ahuja, T.L.Magnati, B. Orlin: Network Flows-Theory, Algorithm and Applications, Prentice Hall, NJ, 1993.

J.D. Weist and F.K. Levy: A management guide to PERT/CPM, 2nd Edition, PHI,1967 (Reprint 2007).