

## MATH 5845 - Operations Research

Fall 2026 Syllabus, Section 03, CRN 41553,

Credit hours: 3

### Instructor

Seok Gi Lee

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### Public Instructor Information

Instructor Title: Assistant Professor

Instructor Professional Qualifications: PhD, Industrial and Manufacturing Engineering, Pennsylvania State University

Instructor Office Location: Moser 2465

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### Course Description

5845. Operations Research. An introduction to operations research with emphasis on mathematical methods. Topics may include: linear programming, sensitivity analysis, duality theory, transportation problems, assignment problems, transshipment problems, and network problems. Prereq.: MATH 3715 and MATH 3720. 3 s.h.

### Course Readings

| Group    | Title                               | Author                | ISBN           |
|----------|-------------------------------------|-----------------------|----------------|
| Optional | Introduction to Operations Research | Hillier and Lieberman | 978-1259162985 |

All course content will be summarized in PowerPoint slides and uploaded to Blackboard.

The course readings are subject to change in the event of extenuating circumstances, research developments, current events, and/or to ensure better learning.

### Course schedule (subject to change depending on the progress of the lecture)

| Week of | Proposed Topic                                                                  | Due/To Prepare for Class |
|---------|---------------------------------------------------------------------------------|--------------------------|
| 8/24    | Linear programming formulation - 1                                              |                          |
| 8/31    | Linear programming formulation - 2                                              |                          |
| 9/7     | Graphical solution of two-dimensional linear programs                           |                          |
| 9/14    | Overview of simplex method<br>Simplex algorithm                                 |                          |
| 9/21    | Simplex algorithm                                                               |                          |
| 9/28    | Integer programming formulation                                                 |                          |
| 10/5    | Branch-and-bound algorithm - 1                                                  |                          |
| 10/12   | Branch-and-bound algorithm - 2                                                  |                          |
| 10/19   | Optimization solver – Gurobi & Excel solvers<br>Dynamic programming formulation |                          |
| 10/26   | Dynamic programming applications                                                |                          |
| 11/2    | Network and algorithms – Graph concepts                                         |                          |
| 11/9    | Network approach applications - 1                                               |                          |
| 11/16   | Network approach applications - 2                                               |                          |
| 11/23   | Course project instruction<br>Thanksgiving holiday                              |                          |



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|-------|----------------------------|
| 11/30 | Course project instruction |
| 12/7  | Review materials           |

The course schedule, policies, procedures, and assignments in this course are subject to change in the event of extenuating circumstances, by mutual agreement, and/or to ensure better learning.