

**Operations Research**  
**COURSE NUMBER: 26:711:561**  
**COURSE TITLE: Mathematical Methods for Economics**

**COURSE DESCRIPTION**

This course begins with a review of basic calculus with applications to economics. We then study solutions of linear equation using matrices. We graduate to calculus of several variables. And finally analyze methods of optimization to problems having constrained or non-constrained conditions.

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**COURSE MATERIALS**

Text: Mathematics for Economists by Simon and Blume, W .W. Norton & Company, ISBN 0 393 95733 0

Reference: Fundamental Methods of Mathematical Economics by Chiang and Wainwright, McGraw-Hill Irwin, ISBN 0 07 010910 9

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**FINAL GRADE ASSIGMENT**

Assignments	33 1/3%
Quizzes	33 1/3%
Final	33 1/3%

Operations Research (26:711:561)

**COURSE SCHEDULE**

1. Functions of one variable, limits, continuity, differentiability, rules for differentiation
2. Critical points, local and global relative maximum and minimum, graphing
3. Applications, linear systems, matrix operations, Gauss and Gauss-Seidel reduction
4. Solutions to linear equations by reduction or using determinants, Cramer's rule
5. Rules for integration, integration by parts, definite and indefinite integration
6. Numerical methods of integration, Euler and Simpson's rule
7. Properties of  $\mathbb{R}$  and  $\mathbb{R}^n$ , functions of several variables, continuity, differentiability
8. Partial differentiation, gradients, directional derivative, level curves.
9. Local approximation, Taylor formula with remainder, critical points, local condition for max or min
10. Unconstrained optimization, application to economics
11. Constrained optimization, boundary conditions, equality constraints, Lagrange method
12. Inequality constraints, Kuhn-Tucker conditions, applications
13. Variational Inequalities
14. Examples, utility maximization, cost minimization
15. Final Exam

**Honor Pledge**

Rutgers University, in conjunction with the RBS Committee comprised of faculty, students and staff, has established an Honor Code that states:

"I pledge on my honor, that I have neither received nor given any unauthorized assistance on this examination."