

Form (H)
Short course description

Course title: Computational Methods in Operations Research	Course number and code: OPER 435
Previous course requirement: OR 331	Language of the course: English
Course level: year 4/level 8	Effective hours: 3 (2+0+2)

Course description

The course uses the optimization toolbox defined under Matlab to handle some topics in Operation research.

Course Description: The following gives a brief the course during one semester.

- Manipulating with optimization application in Matlab
- Solving unconstrained optimization problems
- Solving constrained optimization problems
- Minimization with gradient and Hessian
- Solving nonlinear constraints with gradients
- Solving optimization problems using fmincon interior-point algorithm with analytic Hessian

Using symbolic mathematics with optimization toolbox solvers

Course objectives

Understand the basic concepts and terminology of matlab
Be able to formalize an operation research problem under matlab
Understand the processes involved in built-in algorithms of optimization under matlab
Appreciate the advantages and disadvantages of using built0in algorithm of optimization in matlab

Learning outcomes (understanding, knowledge, and intellectual and scientific skills)

After studying this course, the student is expected to be able to:

Ability to formulate optimization problems in Matlab
Ability to use computational techniques under Matlab to solve nonlinear optimization problems
Understating the pseudo of the optimization algorithms in the optimization Matlab toolbox
Differentiating among optimization algorithms
Ability to model of real life problems related to optimization
Ability to use computational techniques to solve optimization problems
Acquire additional mathematical models of real life systems

Textbook adopted and supporting references

Title of the book	Author's name	Publisher's name	Date of publication
Introduction to Linear Programming with MATLAB	Shashi Kant Mishra, Bhagwat Ram	Taylor & Francis	2018
Numerical and Analytical Methods with MATLAB for Electrical Engineers	William Bober & Andrew Stevens	Taylor & Francis Group, LLC	2013