

## Topics

The course is designed for analysts, researchers and software engineers interested in solving optimization models using mathematical programming techniques. In addition to extensive discussion of the language syntax, key concepts underlying linear, integer and nonlinear optimization are covered. Hands-on exercises ensure that attendees gain extensive practical experience in using AMPL.

### *Overview*

Problems of interest  
AMPL background

### *Basic syntax*

Model objects  
Data specification  
Functions

### *Linear and integer models*

Syntax  
Controlling CPLEX

### *Others model types*

Piecewise-linear constructs  
Networks  
Nonlinear programs  
Quadratic programs

### *CPLEX*

Algorithmic basis  
Performance tuning

### *AMPL command language*

Specifying directives  
Input / output  
Simple model changes

### *Procedural syntax*

Flow control  
Debugging scripts  
Model modification  
Messages and logs

## Objectives

Learn to use AMPL to solve optimization problems:

- Gain familiarity with the user interface
- Build complete and correct problem formulations
- Understand solver behavior, limitations and control
- Get exposure to writing scripts using AMPL's procedural syntax

## Prerequisites

- No formal prerequisites, though previous exposure to programming and optimization is helpful

## Length

- 3 days
  - 9am – 5pm
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### *Miscellaneous topics*

Sensitivity  
Database connectivity  
Application development

### *Conclusion and Open Forum*

Discussion of participants' questions

