

# Introduction to Optimisation Course

This course will provide an introduction to concepts in problem formulation and solution methods for linear, nonlinear and mixed-integer problems. The course will be primarily focused on local optimisation methods, with a brief introduction to global optimisation. It is designed for industry practitioners and will provide an overview of the types of problems that can be solved with today's tools and some hands-on experience. No prior knowledge of optimisation is assumed. By the end of the course, users will have an understanding of how to approach the formulation and solution of optimisation problems. They will be ready to attend the Advanced Optimisation Course.

## Instructions

The course will take place online. You will be given course materials and videos of each module, two weeks in advance. Please read the course materials and familiarise yourself with the content and watch the videos as much as you need. On the day of the course you will be able to attend live sessions with the tutors. The live sessions will take place in the morning and afternoon. You would have been asked to choose a morning or afternoon live session when registering for the course. Please make a note of your live sessions. You can only attend one live session per module so please ensure you are on time.

Imperial College  
London



## The Sargent Centre for Process Systems Engineering

### Introduction to Optimisation Course 21-22 September 2021

#### Enrolments

Course enrolments are open until 10<sup>th</sup> September 2021. Please note, the course will be held in the afternoon, unless, there is demand for morning sessions.

#### Cancellations

Cancellations must be received in writing before or on 15 September 2021 and will be subject to an administration charge of £50.00. It is regretted that cancellations received after 15 September 2021 cannot be accepted and the attendee will be liable for the full course fee. Substitutions may be made at any time, whilst a valid place is held. The organiser cannot accept liability for costs incurred in the event of a course having to be cancelled as a result of circumstances beyond its reasonable control.

If you would like to discuss the course, please email us on:  
[cpse@imperial.ac.uk](mailto:cpse@imperial.ac.uk)





## Introduction to Optimisation Course

21 September 2021 – Morning Session

### **Nonlinear Programming (NLP)**

#### **NLP Live Session (Dr Panos Petsagkourakis)**

- 09.00 - 09.05 Introduction and Welcome
- 09.05 - 09.15 Summary
- 09.15 - 09.25 Q&A (NLP)
- 09.25 - 09.45 Exercises
- 09.45 - 10.00 Break
- 10.00 - 10.45 Hands-on exercise
- 10.45 - 11.00 Break

### **Linear Programming (LP)**

#### **LP Live Session (Dr Antonio Del Rio Chanona)**

- 11.00 - 11.10 Summary
- 11.10 - 11.20 Q&A (LP)
- 11.20 - 12.05 Hands-on exercise

21 September 2021 – Afternoon Session

### **Nonlinear Programming (NLP)**

#### **NLP Live Session (Panos Petsagkourakis)**

- 14.00 - 14.05 Introduction and Welcome
- 14.05 - 14.15 Summary
- 14.15 - 14.25 Q&A (NLP)
- 14.25 - 14.45 Exercises
- 14.45 - 15.00 Break
- 15.00 - 15.45 Hands-on exercise
- 15.45 - 16.00 Break

### **Linear Programming (LP)**

#### **LP Live Session (Dr Antonio Del Rio Chanona)**

- 16.00 - 16.10 Summary
- 16.10 - 16.20 Q&A (LP)
- 16.20 - 17.05 Hands-on exercise



## Introduction to Optimisation Course

22 September 2021 – Morning Session

### **Mixed-Integer Programming (MIP)**

#### **MIP Live Session (Dr Mahdi Sharifzadeh)**

09.00 - 09.10 Summary  
09.10 - 09.20 Q&A (MIP)  
09.20 - 10.05 Hands-on exercise  
10.05 - 10.20 Break

### **Introduction to Global Optimisation (GO)**

#### **GO Live Session (Dr Chryssa Kappatou)**

10.20 - 10.30 Summary  
10.30 - 10.40 Q&A (GO)  
10.40 - 11.25 Hands-on exercise  
11.25 - 11.40 Break

### **Optimisation Surgery**

#### **Bring your own optimisation problem Live Session with Tutors**

11.40 - 12.40 Bring your own optimisation problem

22 September 2021 – Afternoon Session

### **Mixed-Integer Programming (MIP)**

#### **MIP Live Session (Dr Mahdi Sharifzadeh)**

14.00 - 14.10 Summary  
14.10 - 14.20 Q&A (MIP)  
14.20 - 15.05 Hands-on exercise  
15.05 - 15.20 Break

### **Introduction to Global Optimisation (GO)**

#### **GO Live Session (Dr Chryssa Kappatou)**

15.20 - 15.30 Summary  
15.30 - 15.40 Q&A (GO)  
15.40 - 16.25 Hands-on exercise  
16.25 - 16.40 Break

### **Optimisation Surgery**

#### **Bring your own optimisation problem Live Session with Tutors**

16.40 - 17.40 Bring your own optimisation problem