

# ILOG CP - Scheduler

## Topics

This course introduces Scheduler, the ILOG CP library with enhancements for solving scheduling problems. The course is structured around a set of scheduling and resource allocation problems. Each part comprises a lecture and a lab.

### *Schedule, activities and temporal constraints*

The class `IloSchedulerEnv`  
 Activities  
 Time-bound constraints  
 Precedence constraints

### *Scheduler model object parameters*

Scheduler parameters classes  
 Local parameters  
 Using parameters

### *Resources*

Resources (the class `IloResource`)  
 Capacity resources  
 Discrete resources  
 Unary resources

### *Step functions*

Rationale  
 The class `IloNumToNumStepFunction`  
 The class `IloNumToAnySetStepFunction`  
 Use of step functions in resources

### *Resource constraints*

The class `IloResourceConstraint`  
 Time extents  
 Declaring and using resource constraints

### *Breakable activities*

Breaks on resources  
 Behavior of activities

### *Transition times*

Defining transition times between typed activities  
 Defining transition times between two resource constraints

### *The goal `IloRankForward`*

Introduction to search goals  
 Ranking resource constraints

### *Setting times*

Scheduling in chronological order (`IloSetTimesForward`)  
 Scheduling in anti-chronological order (`IloSetTimesBackward`)

## Objectives

- Understand the important Scheduler base classes and how to use them.
- Understand how to access ILOG CP – Solver facilities from Scheduler.
- Be ready to construct your own scheduling application.

## Prerequisites

A working knowledge of:

- C++ language
- ILOG CP – Solver

## Length

- 3 days
- 9:00 am – 6:00 pm

### *Consumable and replenishable resources*

Modeling consumable resources  
 Replenishable resources: `IloReservoir`

### *Enforcement levels and resources relaxation*

Enforcement levels  
 Open and closed resources  
 Resource relaxation

### *Scheduler engine*

Rationale  
 Corresponding classes with modeling  
 Additional topics  
 Global resource constraints

### *Defining new goals*

Rationale  
 Selectors  
 Choice points

### *Conclusion and open forum*

Discussion of participants' questions

### *Optional course units*

Managing solutions  
 Transitions in Scheduler engine  
 Alternative resources  
 State resources  
 More about solution search  
 More about breaks