

How to use the Gen3 lite curriculum?

This curriculum includes five lab assignments which can cover a total of up to 10 hands-on sessions. The subjects treated cover many of the typical topics taught in undergraduate-level introductory robotics classes, all applied to Kinova's Gen3 Lite robot, our professional-grade, cost-effective, robotic arm. The experience acquired during these sessions will be meaningful to your students not only because they put in practice theoretical notions applicable to any robot, but also because the Kortex™ API used as an interface with Gen3 lite is also shared with Kinova's research-grade and industrial-grade robots. Our MATLAB interface will enable your students to be slowly introduced to robot programming using a language and programming environment that they are already familiar with.

Content of this curriculum

This curriculum contains five lab assignments, two of which are separated in multiple parts to enable you and your students to be able to accomplish all the manipulations during a two to three hour session. The subjects covered are:

- Introduction to Gen3 lite
- Forward kinematics
 - Using Denavit-Hartenberg parameters
 - Using rigid transformation formalism
- Inverse kinematics
 - With spherical wrist
 - Using an iterative algorithm
 - Using Newton's algorithm
- Trajectory planning
- Modeling

Each assignment covers the theory necessary to complete it, a preparation section - which can be done outside of class, a hands-on section using the robot as well as questions testing the comprehension of the students. Each is also provided with a Solution document, as well as MATLAB code associated with the implementation part of each assignment.

Getting started

Should you or your students have never used a Kinova® robot before, we advise you to begin with the Introduction to Gen3 lite assignment, which requires no preparation and introduces both the Kinova Kortex Web App, our teach-pendant-like GUI, and our MATLAB API.

Adapting the content to your class

We know that you are the person best suited to understand the teaching style that is most effective with your students, so do not hesitate to adapt our content to your preferences. You may choose to reorder the assignments or to share with your student some or all of the MATLAB code to gain time in class.