

# QLABS VIRTUAL BALL AND BEAM

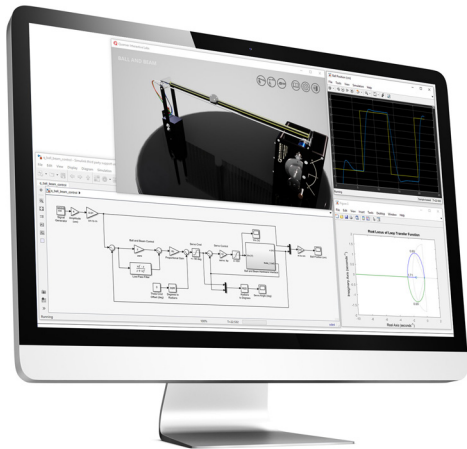
## Virtual platform for distance and blended undergraduate control systems courses

QLabs Virtual Ball and Beam is a fully instrumented, dynamically accurate digital twin of the Quanser Ball and Beam system. It behaves in the same way as the physical hardware and can be measured and controlled using MATLAB®/Simulink® and other development environments. With QLABs Virtual Ball and Beam, you can enrich your lectures and activities in traditional labs, or bring credible, authentic model-based lab experiences into your distance and online control systems course.

Same as the physical Ball and Beam, the virtual system features a track on which a ball is free to roll. The track is effectively a potentiometer, outputting a voltage proportional to the position of the ball. The tilt angle of the track is controlled by the Rotary Servo's DC motor.

QLabs Virtual Ball and Beam is available as a 12-month, multi-seat subscription. The platform is compatible with the physical Ball and Beam curriculum, which covers various modelling and control topics.

### Features



#### Academically appropriate

High-fidelity, credible lab experiences equivalent to use of physical lab equipment



#### Comprehensive Resources

ABET-aligned curriculum



#### Open access

Full access to system parameters through MATLAB®/Simulink®



#### Scalable

12-month, multi-seat subscription

### Courseware

#### Modelling Topics

- First-principles derivation
- Transfer function representation
- Linearization
- Model validation

#### Control Topics

- PID control
- Multiple loops
- Root locus

QLabs Virtual Ball and Beam runs on Windows 10 (64-bit) and requires MATLAB 2019a or later (not included).

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