Installing MATLAB and Simulink for Arduino Code Generation

Pre-Session Setup

Before attempting an ACE-Lab practical session, ensure that MATLAB and Simulink are installed and configured on your laptop. The exercises use MATLAB and Simulink for control system design, simulation, experimental analysis and, where applicable, automatic deployment of control algorithms to Arduino hardware.

Install the MATLAB products and toolboxes in Section 2 during the main installation. The Arduino hardware support package is then installed separately from within MATLAB, as described in Section 3.

1. Downloading MATLAB and Simulink

Where possible, install MATLAB R2026a or later. The supplied practical models were developed using R2026a; compatibility with older releases cannot be guaranteed. You will need a MathWorks account and an appropriate licence, which may be available through your university.

Download: https://www.mathworks.com/downloads

2. Selecting Products During MATLAB Installation

When prompted to select products during the MATLAB installer, select the following products given in Table 1, where permitted by your licence. The additional control-design toolboxes support more advanced activities but are not all necessary for every exercise.

Table 1: *Product, Purpose of the Product and Priority for Installation*

Product	Purpose	Priority
MATLAB	Numerical analysis, plotting and processing experimental data.	Required
Simulink	Graphical modelling, simulation and implementation of control algorithms.	Required
Control System Toolbox	Transfer functions, stability analysis, step responses and controller design.	Required
Simulink Control Design	Linearisation and analysis/tuning of Simulink control models.	Required
System Identification Toolbox	Developing dynamic models from experimental measurements.	Required
Simulink Coder	Additional C/C++ code generation and generated-code inspection workflows.	Required
Embedded Coder	Advanced embedded-code generation, configuration and optimisation.	Optional
Signal Processing Toolbox	Additional filtering, spectral analysis and signal-processing functions.	Optional

3. Installing Arduino Hardware Support

The practical hardware uses an Arduino Uno based on the ATmega328P microcontroller. After completing the main MATLAB installation, install the following add-on separately:

Simulink Support Package for Arduino Hardware

1. Open MATLAB.
2. Go to Home → Add-Ons → Get Hardware Support Packages (menu labels may vary by release).
3. Search for "Simulink Support Package for Arduino Hardware".
4. Select the MathWorks package and click Install.
5. Follow the installation wizard, including any driver and board-configuration steps.

Important: Choose the Simulink Support Package, not the similarly named MATLAB Support Package for Arduino Hardware. The Simulink package enables model-based deployment from Simulink to Arduino.

For basic Arduino model deployment through this support package, Simulink Coder and Embedded Coder are not mandatory. They are included in the installation table for participants undertaking more advanced code-generation activities.

4. Verify Your Installation

1. Open MATLAB and enter ver in the Command Window to inspect installed products.
2. Enter Simulink and check that the Simulink Start Page opens.
3. Use MATLAB Add-Ons to confirm that Simulink Support Package for Arduino Hardware is installed.
4. If you have an Arduino Uno, connect it via USB and run the hardware setup or a simple LED blink model to verify deployment.

5. Pre-Session Checklist

☐ MATLAB R2026a or later installed, where possible

☐ Simulink installed and opens successfully

☐ Recommended control-design toolboxes selected where available

☐ Simulink Coder selected if advanced code-generation activities are planned

☐ Simulink Support Package for Arduino Hardware installed

☐ Hardware drivers and connection verified where an Arduino is available

MathWorks reference: https://www.mathworks.com/help/simulink/supportpkg/arduino_ug/install-support-for-arduino-hardware.html