



# Learn and Intern

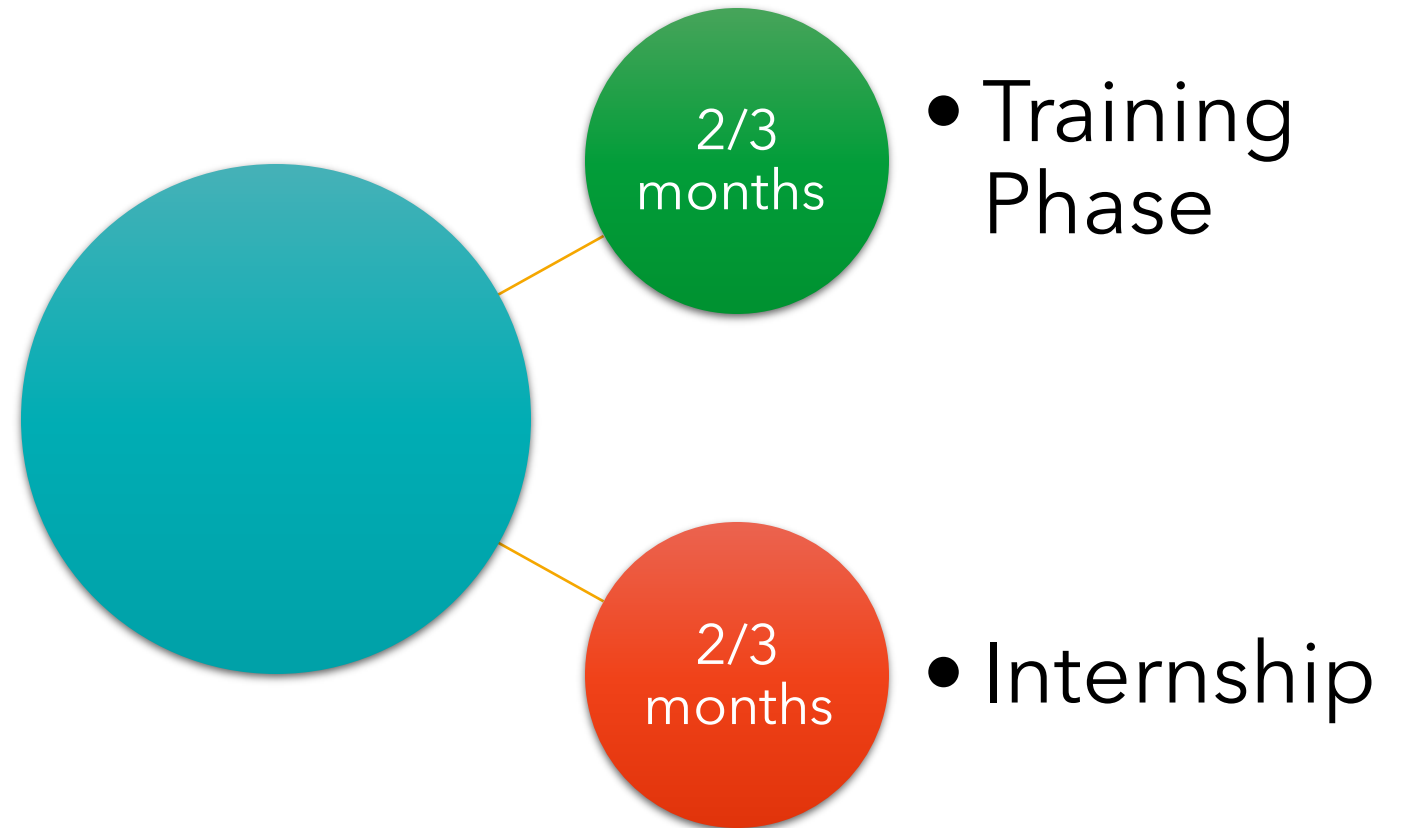
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Training Program for Powertrain Controls

2021

## Program Structure

The Learn and Intern program offers engineers a unique opportunity to train under industry professionals and obtain experience while working on a live project.





# Training Phase

Following topics will be covered in the training phase:

Seminar Topic	Coverage	Duration
Introduction to Control Theory	<ol style="list-style-type: none"><li>1. Transfer functions,</li><li>2. PID</li><li>3. State space representation</li><li>4. Stability concepts</li><li>5. Bode plot and Nyquist criterion</li></ol>	1 week
Introduction to Modeling	<ol style="list-style-type: none"><li>1. Types of drive cycles and their significance</li><li>2. Powertrain sizing</li><li>3. Road load model development</li></ol>	1 week
Motor Modeling and Control	<ol style="list-style-type: none"><li>1. Types of motors</li><li>2. Drive motor modeling</li><li>3. Introduction to control techniques</li><li>4. BLDC motor control</li></ol>	1 week
Introduction to EV Modeling	<ol style="list-style-type: none"><li>1. Introduction to the V model</li><li>2. Significance of system modeling</li><li>3. Subsystem development and testing using Simulink</li><li>4. Vehicle level model integration</li><li>5. Testing and Analysis</li></ol>	1.5 week
Model In Loop, Software In Loop and Processor In Loop Testing Using MATLAB	<ol style="list-style-type: none"><li>1. Significance of MIL/SIL/PIL testing in automotive controls development</li><li>2. Introduction to MATLAB tools for MIL/SIL/HIL testing</li><li>3. Carrying out MIL/SIL/PIL testing of a transmission controller</li></ol>	1.5 week
Industry Webinar (1) Industry Webinar (2)	<ol style="list-style-type: none"><li>1. Candidates attend an industry webinar in the field of automotive software and MBD deployment</li></ol>	2 weeks

# Internship



- After the training, the candidates will intern with us to work on a current project
- The project for the January Program is:

***"Modeling, simulation, control and comparative analysis of the effect of multi speed and fixed gear transmission on a class C electric vehicle performance and energy efficiency."***



# Project Milestones

The candidates will apply the MBD skills gained during the internship phase:

Milestone	Completion Flag	Duration
Literature Review	<ol style="list-style-type: none"><li>1. Previous studies reviewed</li><li>2. Development scope identified</li></ol>	1.5 weeks
Sub- System Modeling and Testing	<ol style="list-style-type: none"><li>1. Subsystems modeled using Simscape</li><li>2. Test Rig created</li><li>3. Individual component tests analyzed</li></ol>	1.5 weeks
System Integration and Testing	<ol style="list-style-type: none"><li>1. Subsystems integrated to develop the vehicle model</li><li>2. Model behavior is tested and verified</li></ol>	2 weeks
Controller Design	<ol style="list-style-type: none"><li>1. Functional requirements determined</li><li>2. Controller architecture developed</li><li>3. Control strategy optimized</li></ol>	2.5 weeks
Controller Integration	Integration of the controller with the plant model	1.5 weeks
MIL/SIL/PIL testing	Control strategy and architecture validated	1.5 weeks
Analysis and Report Development	<ol style="list-style-type: none"><li>1. Results analyzed</li><li>2. Future scope identified</li><li>3. SAE/IEEE style report generated</li></ol>	2 weeks

# Why should you choose Learn and Intern?

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01

Obtain work experience in the domain and build a demonstrable project.

02

Receive access to our learning resources and solve a real life problem

03

It is a paid internship program with a potential opportunity for a full-time role



Thank you!

For enrollment contact:  
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Coming Soon!

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