

Modelbased Development for XEV Applications

Course details:

- Course code: CON03
- Location: Online delivery
- Duration: 25 hours
- Tools used: Matlab/Simulink, Autocoding, Raptor, Modelon/Other plant modeling, Silver

Check [ONLINE Courses](#) on Gannet Academy for the current schedule and registration information.

Outcomes

After successfully completing this course the student should be able to:

- Build mathematical models for components in a system. System chosen is a Hybrid-Electric Vehicle.
- Follow a process of improvement to generate Simulink models.
- Connect component models together to model a larger more complex system.
- Setup and run Model-in-the-Loop Simulations (MIL).
- Setup and run real-time simulations Software-In-Loop (SIL) system.
- CAN communication capability.
- Create Control models for Raptor ECUs
- Deploy a control algorithm on a real ECU.
- Apply verification and validation methods to a model of a physical systems.

Topical Outline:

S.No	Lesson	Topic	
1	Intoduction	System Architecture and Tools	
		V&V Overview	
2	Plant Model creation	Motor model Driver model Battery model Diesel Engine model	

		Brake model	
3	Controller Development	Create a Genset and build a formal controller Multiloop Control and post processing Working of Brake model and controller Control of Regen Braking and SOC Partitioning of System Debugging System Initialization and Shifting Stateflow development	
4	Introduction to the SIL platform	Silver Basics tutorial	
5	Raptor Basics	Introduction to Raptor components Creating Simple Raptor Projects Foreground processes PWM Examples Wiring diagrams and connections PWM Project creation	
6	Electronic Throttle Control	Creating ETC Controls in Simulink Build and Flash ECU with ETC Control	
7	CAN Basics	CAN Basics Course (offline) CAN Blocks in Raptor Connecting 2 ECUs and 1 PC via CAN	
8	Putting it all together	Closeloop testing in Silver Plant and Controller import to Silver Tuning Controller via RaptorCAL Demonstration of working model Summary	

Who Should Attend:

- Candidates who would like to learn & apply Modelbased Development for any Automotive application
- Managers and engineers interested in a basic overview of EV/HEV Controls development
- Candidates interested in Verification & Validation, Simulation and ECU Controls

Pre-requisites:

None