This comprehensive coursework is designed for those from corporate and individual engineers who are interested to have complete knowledge related to different aspects of modeling and simulation of automotive cooling system in GT-COOL. This includes areas such as engine cooling system, engine coolant jacket, underhood cooling system (UHCS), HVAC, and few case studies. The participants will get basic & advanced level of exposure of GT-COOL, COOL-3D, GT-POST, and GEM-3D software. Participants will get good amount of time for practice of software.

The participants are expected to have good knowledge of automotive cooling system and basic knowledge of ICE working.

This course would add high end value to the participants and help them to build career in this niche field. We consider your candidature for placement when there are requirements from our customers.

- Duration - 5 days; 1/2 sessions; 8 hrs per day
- Trainer industrial experience - Over 16 years

Fundamentals of GT-COOL:
- Concept of 3D system level simulation
- Modeling pipes in GEM-3D
- Subassemblies - Internal, external, and encryption
- Solver basic of fluid flow and heat transfer model for the pipe, heat exchanger, and mechanical components (pump & fan)
- Implicit and explicit solver
- Model setup - Initialization, parameter sweeps, convergence, etc
- Post-processing using GT-POST
- Optimization techniques - Direct/ design of experiments (DOE)

Engine Cooling System Modeling:
- Modeling full engine cooling system including components coolant flow circuit, heat exchanger (aftercooler, intercooler, radiator, and EGR cooler), pump, thermostat, etc
- Cooling system software
- Sensitivity study of cooling system variables
- Optimization of cooing system variables to meet cooling system heat load requirement

Underhood Cooling System Modeling:
- Modeling complete vehicle underhood cooling (UHC) system in Quasi-3D environment. Major components include grills, radiator, condenser, CAC, fan, shroud, and blockage
- UHC system calibration
- Sensitivity study of UHC system variables
- Optimization of UHC system components (e.g., sizing & positions of radiator, CAC, condenser, fan; number of fans; HEX scaling, etc) for desired heat load requirement

Coolant Jacket Modeling:
- Detailed modeling of coolant jacket
- Integration of coolant jacket, UHC system, engine cooling system and engine system
- Sensitivity study of different cooling system and engine system variables
- Thermal analysis of cylinder components
- Fast engine warm-up study

HVAC:
- Modeling refrigerant flow network and A/C system components compressor, drier/receiver, evaporator, condenser, TXV, pump, etc
- Detailed modeling of vehicle cabin
- Integration of HVAC with other systems
- Sensitivity study of different system variables