Capabilities & Research Focus

Department of Mechanical Engineering
2014-2015
**Research Focus**

- Comprehensive, robust and economical Computational Fluid Dynamics (CFD) methods for complex turbulent flow and heat transfer
- Advanced, physics-based turbulence models for steady flow
- Unsteady methods & semi-deterministic stress model (SDSM)
- Conjugate heat/mass transfer methods

**Application Areas**

- Spark and compression ignition type IC engine intake system simulation
- Steady and unsteady aerodynamics of passenger and race cards
- High-fidelity turbulence field for vehicle aerodynamic noise prediction
- Coupled aero & vehicle dynamics
Research Focus

- Near-wall treatment methods for use in conjunction with steady & unsteady turbulence models
- Laminar-to-turbulent boundary layer transition prediction model
- Convex & concave curvature effects, length scale inhomogeneity, mainstream turbulence and rational effects

Application Areas

- Gas turbine heat transfer and aerodynamics
- Steady and unsteady axial flow compressor aerodynamics
- Bio-fluid mechanics
- Enhanced heat and mass transfer devices