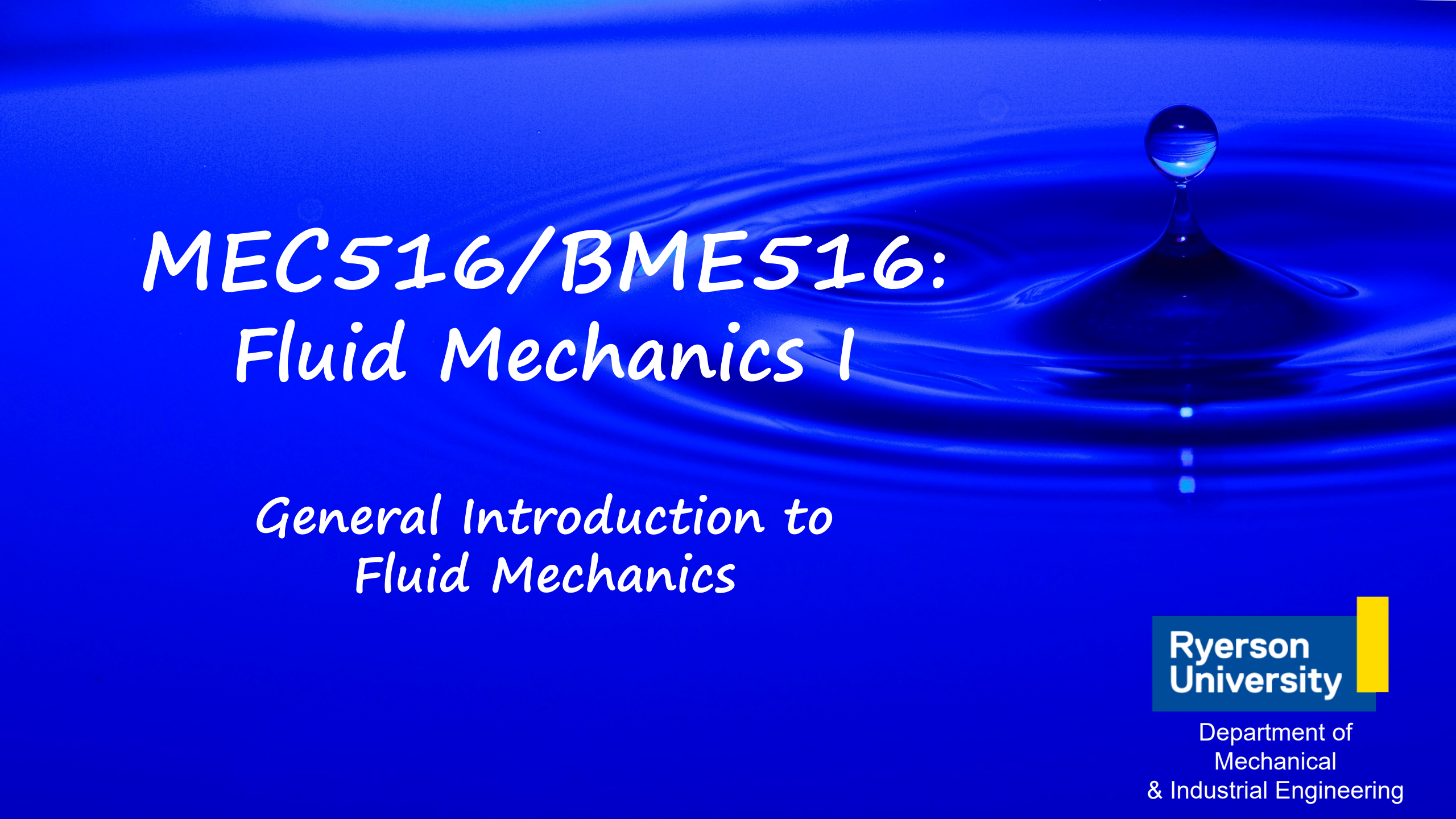


MEC516/BME516: Fluid Mechanics I

General Introduction to Fluid Mechanics

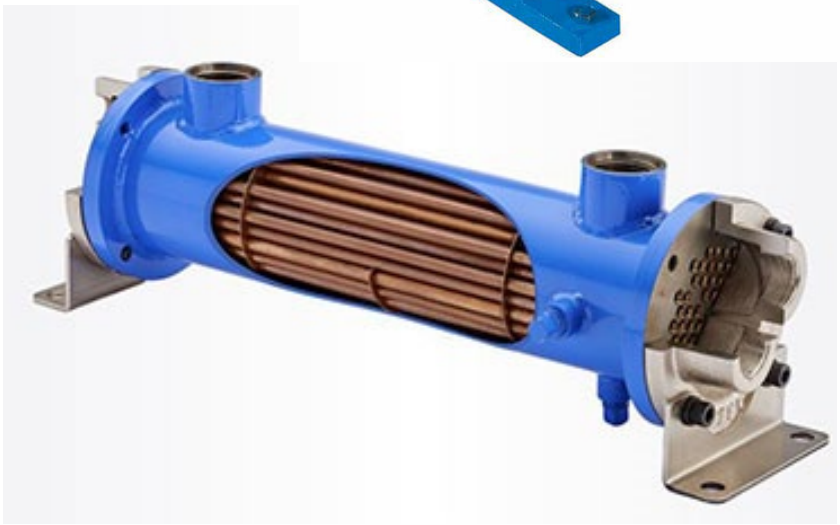
Ryerson University
Department of Mechanical & Industrial Engineering

Engineering Applications of Fluid Mechanics

- Heating, Ventilating, Air-conditioning (HVAC), e.g. furnaces, air conditioners, heat pumps, fans and ducting systems

Engineering Applications of Fluid Mechanics

- Industrial Pump and Piping Systems

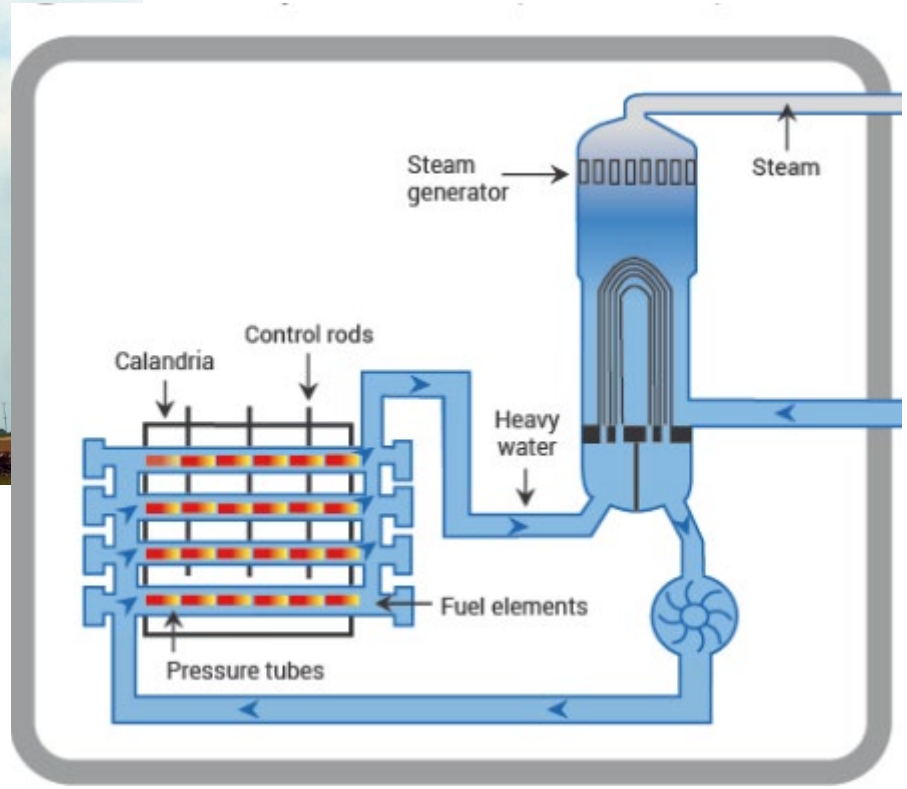


Engineering Applications of Fluid Mechanics

- Transportation, e.g. aircraft, automobiles, ships

Engineering Applications of Fluid Mechanics

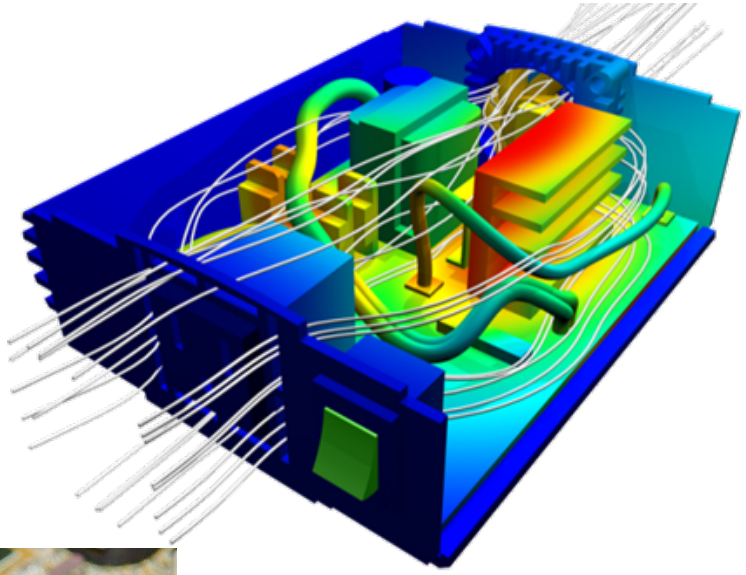
- Electric Power Generation, e.g. boilers, nuclear reactors, turbines, condensers

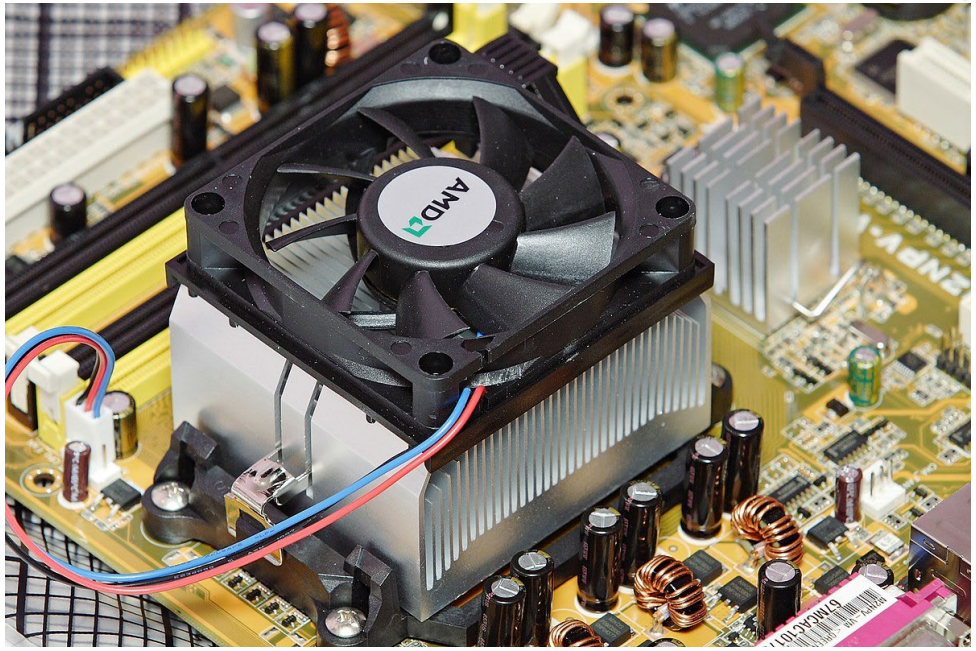


CANDU Nuclear Reactor

Engineering Applications of Fluid Mechanics

- Electronics cooling, e.g. fan cooling of a CPU



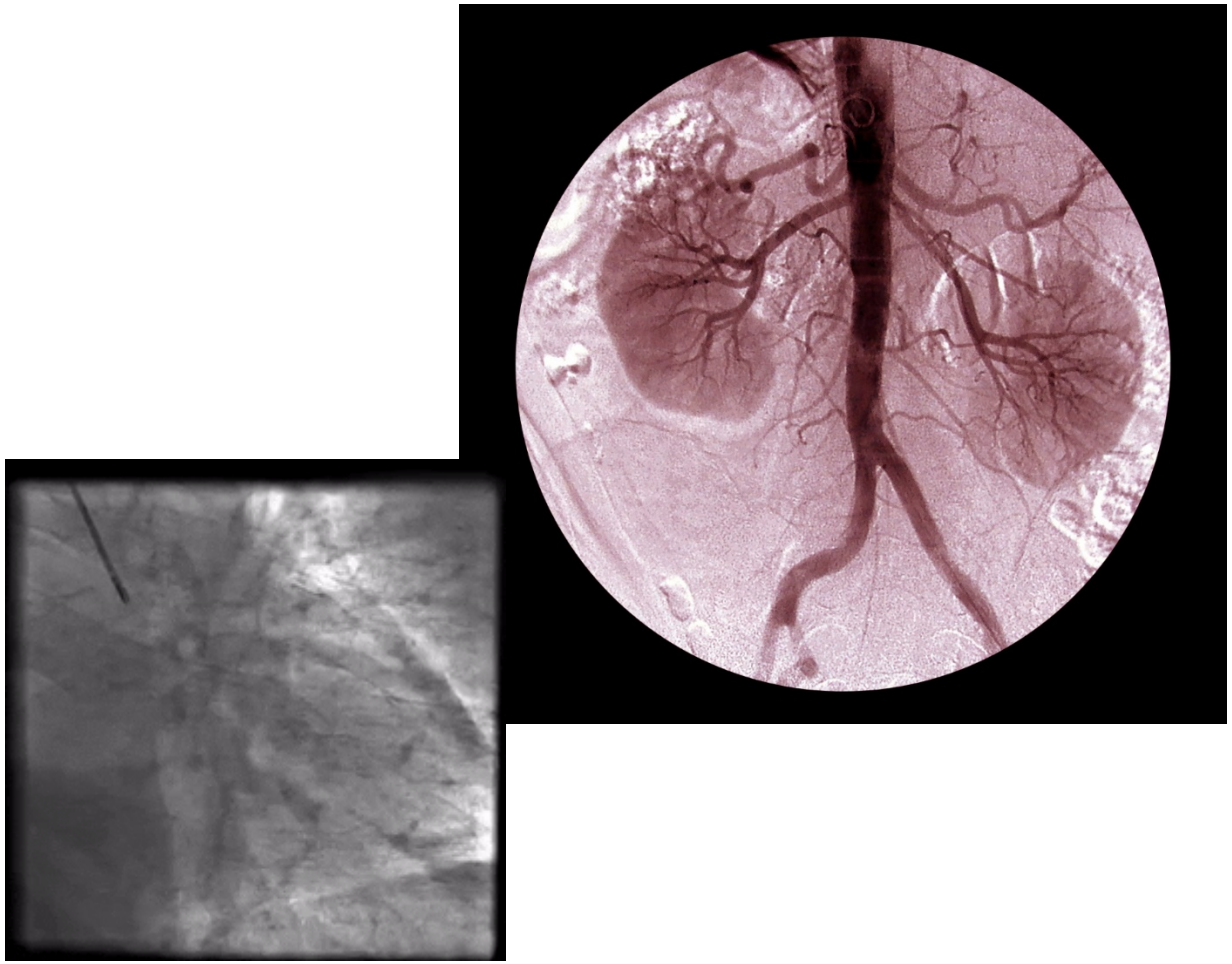


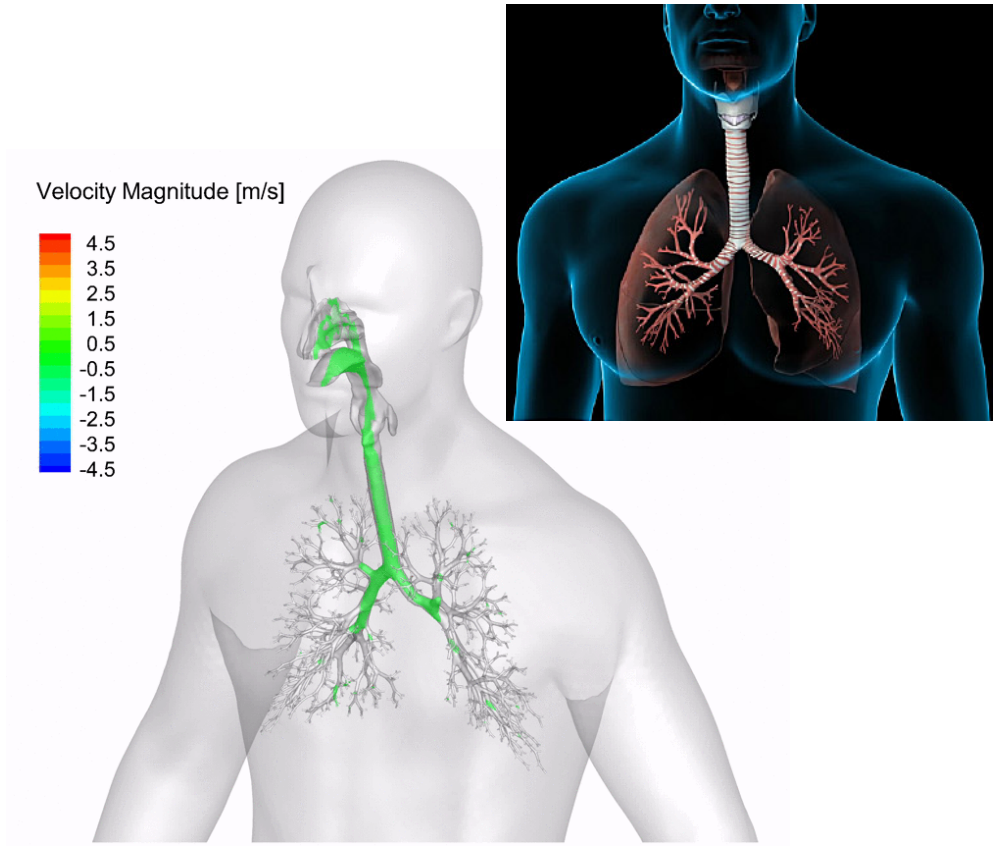
Engineering Applications of Fluid Mechanics

- Renewable Energy, e.g. solar collectors, wind turbines, hydropower, geothermal

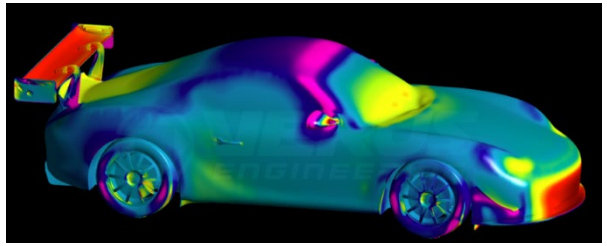
Engineering Applications of Fluid Mechanics

- Biomedical Applications, e.g. cardiovascular system, blood flow
  - Bodily fluids: blood, air, etc.

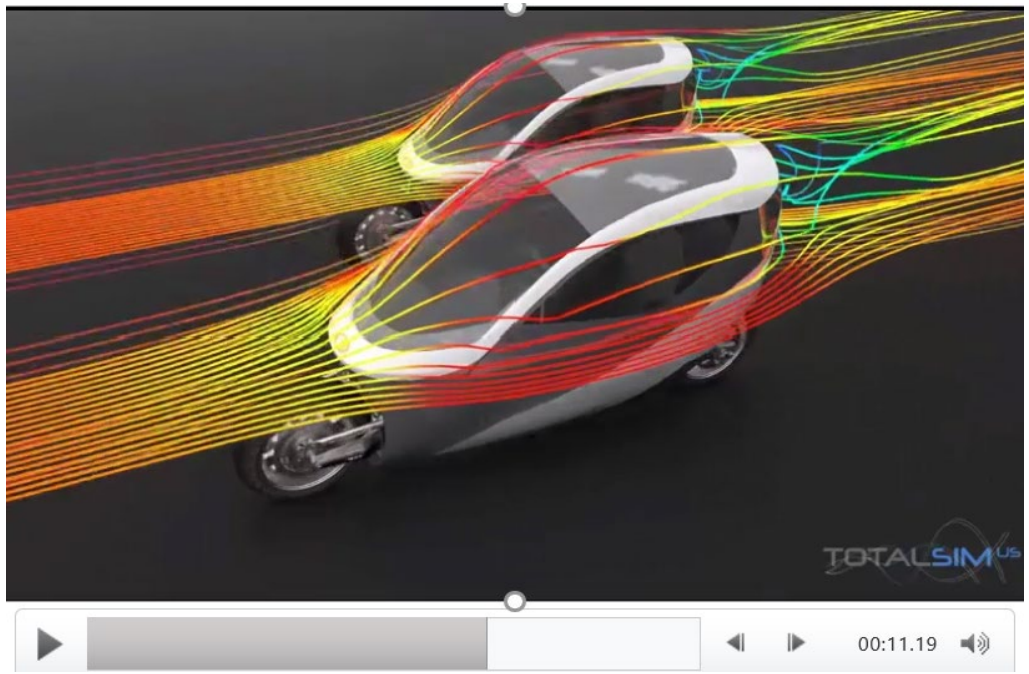




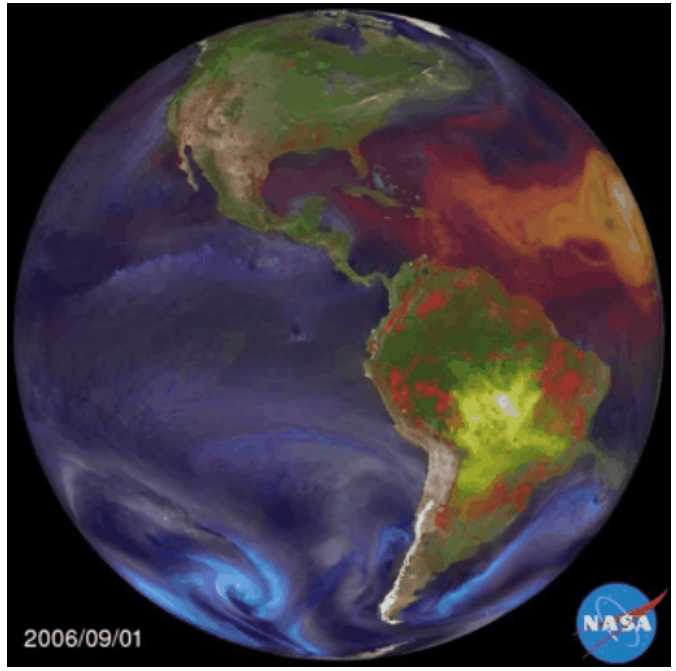
Fluid Mechanics: Gateway to Learning CFD



- Computational Fluid Dynamics (CFD)
  - Numerical solution of the equations for fluid flow (Navier-Stokes Solvers)
  - Commercial software for engineering design (e.g. COMSOL, ANSYS FLUENT)
  - Weather and Climate modelling (NASA)
  - Computer Generated Imagery (CGI) in movies and advertising



Credit: Lit Motors | TotalSim CFD Animation (https://youtu.be/l-PSIc0AX3k)



https://youtu.be/ureGelZPi3o

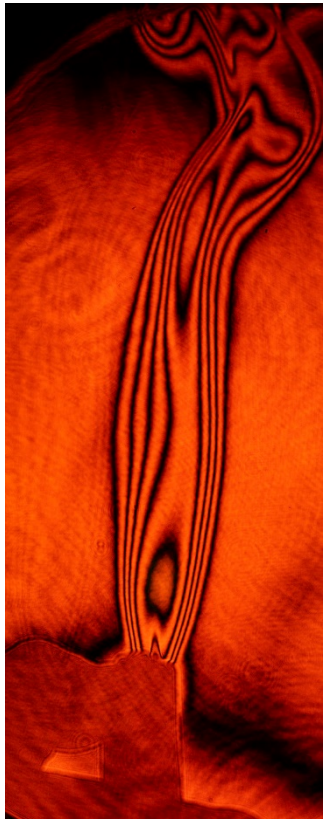
MEC/BME516 Fluid Mechanics I

- This is a first course in fluid mechanics

- Mechanical Eng.
  - MEC616 Fluid Mechanics II, Design Component
  - Prereq. for: MEC701 Heat Transfer
    MEC722 Thermal Systems Design
    MEC740 Env. Control in Buildings (HVAC)
    MEC810 Thermal Power Generation
    MEC817 Combustion Engineering
  - Useful background for MEC825 Capstone Design Project

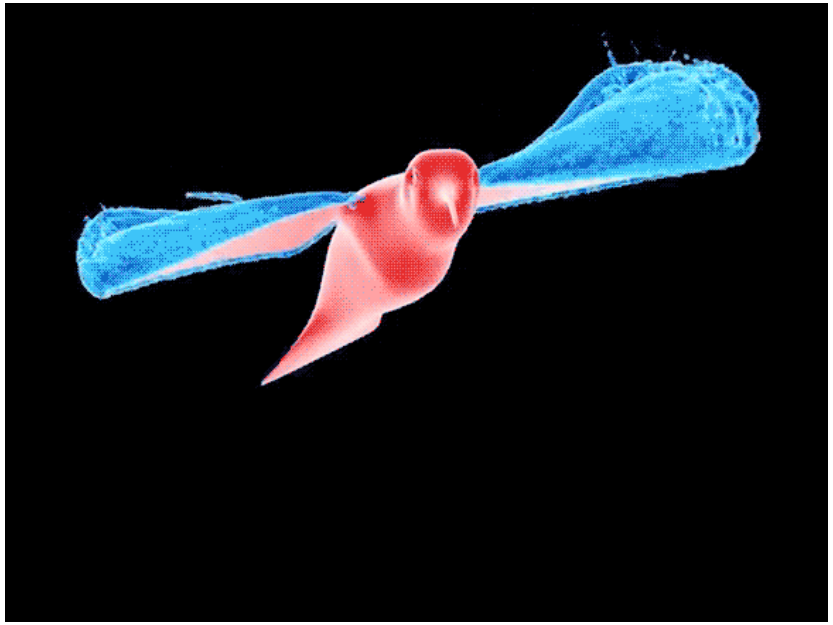
- Biomedical Eng.
  - Prereq. for BME700 Capstone Design Project
  - Useful background for: BME674 Biomedical Instrumentation
    BME804 Design of Bio-MEMS
    BME809 Biomedical Systems Modelling

- Ryerson Graduate Course:
  - ME8102 Advanced Fluid Mechanics



Laser visualization of a flame from a butane Lighter (D. Naylor)

- Fluid Mechanics is all around us



END NOTES

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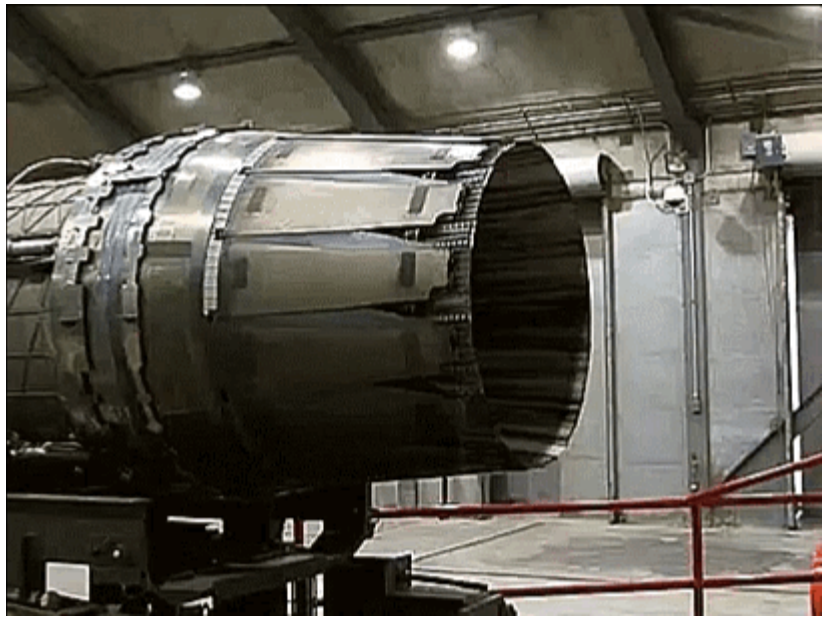

Image Credits: Fluid Dynamics Gifer from GIPHY.com