

M E 320

Supplementary Material

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Note: In order to view the demonstrations below, you must first download CDF player to your PC/Mac/Linux.

Link for CDF player

<http://www.wolfram.com/cdf-player/>

WEEK 1

Surface Tension

<http://www.youtube.com/watch?v=u5AxlJSiEEs>

<http://demonstrations.wolfram.com/SurfaceTensionWalkingOnWater/>

Viscosity

<http://www.youtube.com/watch?v=vNzTYzjLgKE>

Vapor pressure

http://www.youtube.com/watch?v=re9r0kzQp_M

No Slip Condition

<http://www.youtube.com/watch?v=cUTkqZeiMow>

WEEK 2

Tank Equilibria

<http://demonstrations.wolfram.com/TankEquilibria/>

Step Response of a Manometer

<http://demonstrations.wolfram.com/StepResponseOfAManometer/>

Pitot Tube

<http://demonstrations.wolfram.com/PitotTube/>

Measuring Pulmonary Capacity

<http://demonstrations.wolfram.com/MeasuringPulmonaryCapacity/>

WEEK 3

Equation of Continuity

<http://demonstrations.wolfram.com/EquationOfContinuity/>

Flux

<http://demonstrations.wolfram.com/Flux/>

Hydrostatic Pressure

<http://demonstrations.wolfram.com/Pressure/>

<http://demonstrations.wolfram.com/FluidPressure/>

<http://demonstrations.wolfram.com/HydrostaticPressure/>

<http://demonstrations.wolfram.com/EquivalentForcesDueToHydrostaticPressureOnADam/>

<http://demonstrations.wolfram.com/TheHydraulicPress/>

Forces Exerted on an Immersed Object

<http://demonstrations.wolfram.com/ForcesExertedOnAnImmersedObject/>

Motion of a Projectile with or without Air Resistance

<http://demonstrations.wolfram.com/MotionOfProjectileWithOrWithoutAirResistance/>

Couette Flow

<http://demonstrations.wolfram.com/CouetteFlow/>

<http://demonstrations.wolfram.com/DoubleSidedCouetteFlow/>

Pascal's Principle

<http://demonstrations.wolfram.com/PascalsPrinciple/>

The Venturi Effect

<http://demonstrations.wolfram.com/TheVenturiEffect/>

<http://demonstrations.wolfram.com/VenturiEffectOnBloodFlowCausedByCholesterolPlaqueInArteries/>

Torricelli's Theorem

<http://demonstrations.wolfram.com/TorricellisTheorem/>

<http://demonstrations.wolfram.com/TimeToDrainATankUsingTorricellisLaw/>

Fluid Rotating in a Cylinder

<http://demonstrations.wolfram.com/FluidRotatingInACylinder/>

WEEK 4

Fluid Kinematics

<http://www.youtube.com/watch?v=zZ6DJOKf9-c>

<http://demonstrations.wolfram.com/BalancingACanOnItsEdge/>

Vorticity

<http://www.youtube.com/watch?v=mHyTOcfF99o>

<http://www.youtube.com/watch?v=bHAqyYMjvvg&feature=relmfu>

<http://www.youtube.com/watch?v=myYIfUOzdjk>

WEEK 5

Conservation of Fluid Properties

<http://www.youtube.com/watch?v=69M0dtBM7u8>

<http://www.grc.nasa.gov/WWW/k-12/airplane/conmo.html>

http://www.youtube.com/watch?v=mrcEol0_mh0

Week 6

Bernoulli's Theorem

<http://demonstrations.wolfram.com/BernoullisTheorem/>

<http://www.youtube.com/watch?v=bC8v6hIXnSk>

Week 7

Buckingham Pi/Dimensional Analysis

<http://www.youtube.com/watch?v=PmJV8CHIqFc>

http://www.youtube.com/watch?v=_gaCAFcW6OY

WEEK 8

Frictional Pressure Drop in a Pipe

<http://demonstrations.wolfram.com/FrictionalPressureDropInAPipe/>

Fanning Friction Factor for Smooth and Rough Pipes

<http://demonstrations.wolfram.com/FanningFrictionFactorForSmoothAndRoughPipes/>

Von Kármán Vortex Street in Turbulent Flow

<http://demonstrations.wolfram.com/VonKarmanVortexStreetInTurbulentFlow/>

Laminar Flow between Two Eccentric Tubes

<http://demonstrations.wolfram.com/LaminarFlowBetweenTwoEccentricTubes/>

Laminar Flow

<http://demonstrations.wolfram.com/LaminarFlow/>

WEEK 9

Turbine

<http://www.youtube.com/watch?v=nZSBpFMWk-M>

<http://demonstrations.wolfram.com/UnderwaterTurbine/>

WEEK 10

Continuity

<http://demonstrations.wolfram.com/EquationOfContinuity/>

Stream(functions/lines)

<http://demonstrations.wolfram.com/VelocityStreamLinesFromSuperpositionOfElementaryFluidFlows/>

<http://www.youtube.com/watch?v=RV0BV5EGtXw>

Navier Stokes

<http://www.youtube.com/watch?v=Cj8-vu2zsQI>

<http://www.youtube.com/watch?v=t-erFRTMIWA>