

Video List Submission

Notes to Professor:

Most videos I found are owned by the National Committee for Fluid Mechanics Films (NCFMF). Even though they are old (from the 60's), they are extremely useful and have helped me gain a better and broader understanding of key concepts as well as provide me with a mental visualization.

NCFMF Webpage: <http://web.mit.edu/hml/ncfmf.html>

Chapter 1

Introduction

- *Introduction to Fluid Mechanics* <http://www.youtube.com/watch?v=qi2kFgFzeN8>

Chapter 2

Viscosity

- *Viscosity behavior of various fluids* http://www.youtube.com/watch?v=3KU_skfdZVQ
- *High Viscosity* <http://www.youtube.com/watch?v=X4zd4Qpsbs8>

Timeline, Pathline, Streakline, Streamlines, Velocity Field, a small introduction note to Turbulent and Laminar Boundary Layer, last part consist mostly about stall flow.

- *Part 1* <http://www.youtube.com/watch?v=DOUfyDHxkYQ>
- *Part 2* <http://www.youtube.com/watch?v=rDhSdtMjSpA&feature=related>
- *Part 3* http://www.youtube.com/watch?v=uewkm_pKXOc&feature=related

Non Newtonian Fluid

- *Speaker* <http://www.youtube.com/watch?v=3zoTKXXNQIU>
- *Discovery Channel - Pool* <http://www.youtube.com/watch?v=S5SGiwS5L6I>
- *Application: Shear Thickening Liquid Armor* <http://www.youtube.com/watch?v=rYIWfn2Jz2g>

Surface Tension

- Screen <http://www.youtube.com/watch?v=u5AxIJSiEEs>
- Effect of soap on surface tension
<http://www.youtube.com/watch?v=22r1zWOYiRM&feature=endscreen&NR=1>
- Coins <http://www.youtube.com/watch?v=cigNNRIS2yA>
- Pepper Powder http://www.youtube.com/watch?v=R1HR_T8RI_Y

Reynolds Number

- Importance of Reynolds Number <http://www.youtube.com/watch?v=1wNmtle6qkE>
- Low Reynolds Number - Part 1 <http://www.youtube.com/watch?v=hALx7vfmRt4>
- Low Reynolds Number - Part 2
<http://www.youtube.com/watch?v=PhsmOc7Hb8Q&feature=relmfu>
- Low Reynolds Number - Part 3
<http://www.youtube.com/watch?v=zAcwqYezl7A&feature=relmfu>

Boundary Layer, Turbulent and Laminar

- Part 1 <http://www.youtube.com/watch?v=7SkWxEUXIoM>
- Part 2 <http://www.youtube.com/watch?v=49UsvAFKm40&feature=related>
- Part 3 <http://www.youtube.com/watch?v=WEX72jeXTGM&feature=related>

Chapter 3

Pressure Variation in a Static Fluid, Incompressible Liquid, Manometer, Atmospheric Pressure, Hydrostatic Pressure/Force

- Covers most Chapter 3 <http://www.youtube.com/watch?v=265icrI3HkM>

Chapter 4

Conservation of Momentum

- Conservation of Momentum Principle <http://www.youtube.com/watch?v=4IYDb6K5UF8>
- Conservation of Momentum examples http://www.youtube.com/watch?v=mrceol0_mh0
(watch until 2:10 only)

Chapter 5

Motion of a Fluid Particle (Kinematics)

- *Rotation* <http://www.youtube.com/watch?v=cXZ3HXkm9qw>
- *Deformation* <http://www.youtube.com/watch?v=pqWwHxn6LNo>

Vorticity

- *Part 1* <http://www.youtube.com/watch?v=loCLkcYEWD4>
- *Part 2* <http://www.youtube.com/watch?v=h6bmrRFYFbc&feature=relmfu>

Computational Fluid Dynamics (Not covered by Professor).

- This website offers 95 different CFD demonstrations on Fluid Mechanics. “Website Plug In” must be downloaded for the animations to work. User can set different parameters that affect the principle observed.
<http://demonstrations.wolfram.com/topic.html?topic=Fluid+Mechanics&limit=20>

Chapter 6

Dynamic Pressure Flow

- *Pitot Tube* http://www.youtube.com/watch?v=D6sbzkYq3_c
- *Orifice – Nozzle – Venturi* <http://www.youtube.com/watch?v=oUd4WxjoHKY&feature=relmfu>

Chapter 7

Dimensional Analysis

- *Dimensional Analysis, Buckingham PI Theorem Lecture*
<http://www.youtube.com/watch?v=YFu6pidMbBk>

Significant Dimensionless Numbers

- *Mach Number* <http://www.youtube.com/watch?v=VlaGxYjnoPY>

Chapter 8

Laminar vs. Turbulent Flow (Introduction)

- *Demonstration* <http://www.youtube.com/watch?v=WG-YCpAGgQQ>

Flow in pipes and ducts

- *Head loss* http://www.youtube.com/watch?v=eti1pzV_nlw
- *Orifice-Nozzle-Venturi* <https://www.youtube.com/watch?v=oUd4WxjoHKY>

Hydraulic Diameter

- *Difference between circular and rectangular pipes* (Lecture)
<http://www.youtube.com/watch?v=7bf1Y0oJO9Y>

Chapter 9

Fluid flow about immersed bodies

- *Drag and Lift* <http://www.youtube.com/watch?v=4g5ffrolMMc>

EXTRA:

When Fluid apparatuses fail.

The Crash of Air France Flight AF 447.

It is the worst and deadliest accident in French history. Happened on June 1st 2009, killing 216 passengers and 12 aircrew members. To today's date, cause is unknown, even though the black boxes were recovered two years after the accident on May 2011.

The only possible assumption was ice forming in the pitot tubes which gave false sensor readings, this cause is also assumed for the Birgenair Flight 301 in 1996.

- Part 1 <http://www.youtube.com/watch?v=ecX1wxWjpps&feature=related>
- Part 2 <http://www.youtube.com/watch?v=zxB4dWObnhE&feature=endscreen&NR=1>
- Part 3 <http://www.youtube.com/watch?v=8zr2hkJAFjg&feature=endscreen&NR=1>
- Part 4 <http://www.youtube.com/watch?v=G5soJVnVd74&feature=endscreen&NR=1>

Fountains at the Bellagio in Las Vegas

- Refer and read page 302 and 303 from the book for the abstract
<http://www.youtube.com/watch?v=cP0K6H2QK7A>