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.


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=S5SGiwS5L6l
- Application: Shear Thickening Liquid Armor http://www.youtube.com/watch?v=rYIwnF2Jz2g
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=hALx7vfRt4
- 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=4lYDb6K5UF8
- 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](http://www.youtube.com/watch?v=cXZ3HXkm9qw)
- Deformation [http://www.youtube.com/watch?v=pqWwHxn6LNo](http://www.youtube.com/watch?v=pqWwHxn6LNo)

Vorticity

- Part 1 [http://www.youtube.com/watch?v=IoCLkcYEWD4](http://www.youtube.com/watch?v=IoCLkcYEWD4)
- Part 2 [http://www.youtube.com/watch?v=h6bmRbFbc&feature=relmfu](http://www.youtube.com/watch?v=h6bmRbFbc&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.

Chapter 6

Dynamic Pressure Flow

- Pitot Tube [http://www.youtube.com/watch?v=D6sbzkYq3_c](http://www.youtube.com/watch?v=D6sbzkYq3_c)

Chapter 7

Dimensional Analysis

- Dimensional Analysis, Buckingham Pi Theorem Lecture
  [http://www.youtube.com/watch?v=YFu6pidMbBk](http://www.youtube.com/watch?v=YFu6pidMbBk)
Significant Dimensionless Numbers

- Mach Number \( \text{http://www.youtube.com/watch?v=VlaGxYjnoPY} \)

Chapter 8

Laminar vs. Turbulent Flow (Introduction)

- Demonstration \( \text{http://www.youtube.com/watch?v=WG-YCpAGgQQ} \)

Flow in pipes and ducts

- Head loss \( \text{http://www.youtube.com/watch?v=eti1pzV_nlw} \)
- Orifice-Nozzle-Venturi \( \text{https://www.youtube.com/watch?v=oUd4WxjoHKY} \)

Hydraulic Diameter

- Difference between circular and rectangular pipes (Lecture) \( \text{http://www.youtube.com/watch?v=7bf1Y0oJ09Y} \)

Chapter 9

Fluid flow about immersed bodies

- Drag and Lift \( \text{http://www.youtube.com/watch?v=4q5ffroIMMc} \)
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=ecX1wxWjyps&feature=related](http://www.youtube.com/watch?v=ecX1wxWjyps&feature=related)
- **Part 3** [http://www.youtube.com/watch?v=8zr2hkJAFjg&feature=endscreen&NR=1](http://www.youtube.com/watch?v=8zr2hkJAFjg&feature=endscreen&NR=1)
- **Part 4** [http://www.youtube.com/watch?v=G5soJVnVd74&feature=endscreen&NR=1](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](http://www.youtube.com/watch?v=cP0k6H2QK7A)