

# Videos for ME 521 and 522

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## Graduate Fluids Lesson Series

Here is a link to my free YouTube video lessons for this course. The first link is the YouTube Playlist for the lesson videos. The second link lets you download an Excel spreadsheet with the videos along with the annotated notes I created while recording the videos:

[https://www.youtube.com/playlist?list=PLQR3QcO-W5hc32zBQii14HzqEb\\_y6pIh6](https://www.youtube.com/playlist?list=PLQR3QcO-W5hc32zBQii14HzqEb_y6pIh6)

[https://www.me.psu.edu/cimbala/Cengel\\_Cimbala\\_book/Supplements/Graduate\\_Fluids\\_Lessons\\_and\\_Videos.xlsx](https://www.me.psu.edu/cimbala/Cengel_Cimbala_book/Supplements/Graduate_Fluids_Lessons_and_Videos.xlsx)

## NSF Fluid Mechanics Films

### Background

In the 1960s, the National Science Foundation (NSF) funded the **National Committee for Fluid Mechanics Films**, which produced 39 excellent films about various aspects of fluid mechanics. Although these films are dated (most are in black and white), the content and the flow visualization are timeless. They are narrated by some of the most famous fluid mechanics researchers, most of whom have unfortunately passed away. You are *strongly* encouraged to watch all of these films as part of your graduate fluid mechanics education since they provide valuable insight.

### Link

You can watch all of these films on either YouTube or RealPlayer. There are also pdf notes available for nearly all of the films. The website link is <http://web.mit.edu/hml/ncfmf.html>.

### Suggested videos to watch

I recommend below some of the videos that are appropriate for our course lectures.

#### ME 521

- **Week 1:** Eulerian Lagrangian Description
- **Week 2:** Pressure Fields and Fluid Acceleration
- **Week 3:** Deformation of Continuous Media; Rheological Behavior of Fluids
- **Week 4:** Flow Visualization
- **Week 5:** Vorticity, Part 1
- **Week 6:** Vorticity, Part 2
- **Week 7:** Rotating Flows
- **Week 8:** Fluid Dynamics of Drag, Parts I and II
- **Week 9:** Fluid Dynamics of Drag, Parts III and IV
- **Week 10:** Secondary Flow
- **Week 11:** Low Reynolds Number Flow
- **Week 12:** Channel Flow of a Compressible Fluid
- **Week 13:** Fundamental Boundary Layers
- **Week 14:** Boundary Layer Control
- **Week 15:**

#### ME 522

- **Week 1:** Fundamental Boundary Layers
- **Week 2:** Vorticity, Part 2
- **Week 3:** Secondary Flow
- **Week 4:**
- **Week 5:** Flow Instabilities
- **Week 6:** Boundary Layer Control
- **Week 7:**
- **Week 8:** Turbulence
- **Week 9:**
- **Week 10:**
- **Week 11:**
- **Week 12:**
- **Week 13:**
- **Week 14:**
- **Week 15:**