**ME 322, Applied Fluid Mechanics, Summer 2020**

Portland State University

Maseeh College of Engineering and Computer Science

Class meets: No meeting time. Watch two lectures a week at your own pace.

Prerequisites: ME 320…math.

**Textbook**

Required: Fundamental of Fluid Mechanics (Munson, Young, et all.) any edition is cool with me

Optional Supplementary:

* Viscous Fluid Flow, F.M. White, McGraw-Hill, 3rd ed. 2006 (I’m just letting you know this is the other book I’m reading to try and explain stuff…)

Recommended Software

* Excel, Google, WolframAlpha, MATLAB, Mathematica (wolframcloud is free), Python, FORTRAN, Haskell, or whatever tool you use to make computers calculate numbers for you.

**Class Website**

The class website will contain all documents for the term. All hw, projects, and exams can be found. I will email the class anytime I update this repository.

<https://github.com/smohler/ME322-S20>

**Lectures.** YouTube channel just cause it’s an easy platform to watch videos on. I don’t do examples in my lectures. You have to make and do your own examples to solidify solving problems and concepts. This will make you a much better student and engineer.

<https://www.youtube.com/channel/UCoAT5T_6WiV-LhkKTrkVjNw>

**Instructor(s)**

Samuel Mohler, Adjunct Professor, Dept. of Mechanical Engineering

(no office), (no phone), smohler@pdx.edu

Office Hours: Make an appointment with me and we can meet on Skype/Zoom, whatever works. Be active on slack and you will succeed in the class.

**Policies**

Students turn in homework via email to [smohler@pdx.edu](mailto:smohler@pdx.edu). If you have a tablet that can take electronic notes send them as pdfs (no OneNote files please). If you do not have a tablet you can type the homework in word and just type the critical calculations. If you have scanner handwritten submission can be scanned then emailed as pdfs. You are not allowed to take pictures of your homework from your phone and send them as a

submission.

**Grading**

Cumulative grades will be based on the following tentative weights:

20% = HW

5% = Slack Activity

45% = Projects

30% = Final Exam

15% = Extra Credit

If you skip a project, exam, or homework you will not receive extra credit.

**Due Dates:** Theses are suggested. However, if you wait to turn in all home works the very last day of class you will be docked points. The home works are currently all posted now so they can be turned in early if you want. I would rather not accept the home works past these dates.

**HW1: April 5th** (Streamfunctions, Entrance-length, Reynolds Number)

**HW2: April 12th** (Straight Pipes, Friction Factors, Major Losses)

**HW3: April 26th** (Piping Systems with Minor and Major Losses)

**Project 1: May 3rd** (Piping System Tool)

**HW4: May 10th** (Boundary Layers, Lift, Drag, NPSH, Pump Similarity)

**HW5: May 24th (**Pump Speeds)

**Project 2: May 24th** (Pump Selection Tool)

**HW6: May 31st** (If things go well, Compressible Flow problems)

**All Extra Credit, Late HWs, etc: June 8th**

**Final Project: June 10th**

**Projects:** Instead of exams I will be assign projects for the class. Both projects will ask you to implement an analysis of a problem. You will be asked to compare solutions, make plots that can easily be understood, and to for it to be automated. They should end up being tools you can use later on. I change an input I can see all plots, and quantities changes and make decisions based on this. *You will fail these projects if you attempt to solve them in a weekend*. To be successful with these projects you must chip away at them intermittently, ask questions on slack, and clarify things along the way. Since this is applied, these projects test your ability to formulate a problem, solve it based on reasonable assumptions, and to present your findings to superiors.

Project 1: Internal Flow Design Tool

Project 2: Pump Selection Tool

**Final Exam:** In order to address concepts not in the projects I will have a take home exam that covers a little bit of everything at the end of the term. The final is available at the beginning of the term and you may take as long as you like to answer the difficult problems. PLEASE follow the guidelines on the cover sheet for how to answer the questions.

**Course Outline.**

