Reading Recommendations CM3110
Dr. Faith A. Morrison

Prerequisite topics, suggested reference readings:	Source	Chapter	Pages	Section
Steady State Mass & Energy Balances	Felder and Rousseau	Ch 4.2-4.4, Ch7, Ch8.1-8.4a	pp 85-110, 313-381	
Mech Energy Balance	Felder and Rousseau	Ch 7.7	pp 333-337	
	Morrison	Ch 1	pp 8-93	
	Morrison (MEB parts only)	Ch 9	pp 766-800	
	Geankoplis	Ch 2.7F	pp 67-74	2.7F-G
	McCabe, Smith, Harriott	Ch 4	pp 86-94	
Fluid statics	Felder and Rousseau	Ch 3	pp 54-59	
	Morrison	Ch 4.2	pp 236-277	
	Geankoplis	Ch 2.1-2.2	pp 34-42	2.1-2.2
	McCabe, Smith, Harriott	Ch 2	pp 31-44	
Calc 1, 2, 3, 4	Your math text	*Topics*: differentiating, 1D, 2D, and 3D integrating, coordinate systems, vectors, vector fields, dot products		
Prerequisite topics, *YouTube* videos:	**Title (with link)**	**URL-link**	**Notes**	
Mechanical energy balance (single-input, single output, steady, no rxn, no phase change, little temperature change)	Short Intro to MEB	https://youtu.be/e4uEFCtuNic		
	Unit Conversion Issue with MEB	https://youtu.be/5E0i6qw6AeM		
	Analysis of a Pitot Tube	https://youtu.be/Af5RcQ18v_4	ends early	
Fluid statics (fluid velocity=0)	Intro to Manometers: Two rules	https://youtu.be/zeNQOqr63cc		
	Analysis of a Pitot Tube	https://youtu.be/Af5RcQ18v_4		

Texts:

- Faith A. Morrison, *An Introduction to Fluid Mechanics*, Cambridge, New York (2013).
- Christie J. Geankoplis, *Transport Processes and Unit Operations*, 4th Edition, Prentice Hall, New York (2003). Available **free** in electronic form through the Michigan Tech Library's Safari O'Reilly's Learning Platform for Higher Education, (https://learning.oreilly.com/library/view/transport-processes-and/013101367X/?ar). You can sign in with your Tech email, and if you confirm the reply email, your account will store your highlights and notes. If you prefer to use the book anonymously, you can create a dummy account (mickeymouse@mtu.edu) which will work for a few days and then go dead, but you can create it again. You cannot save your highlights and notes.
- Richard Felder and Ronald Rouseau, Elementary Principles of Chemical Processes, 3rd Edition, Wiley, New York (2005).
- Warren McCabe, Julian Smith, Peter Harriott, Unit Operations of Chemical Engineering McGraw-Hill Professional (2004).

Note that there are many references offered. You do not need to use them all; just use the ones that explain it in a way that you can understand and do the homework problems. You may also seek out your own references on the web or in the library.

CM3110 Morrison Recommended Reading Topics and Pages

Lecture	Topics	Text	Sections
0	MEB, fluid statics, calc 1, 2, 3, & 4	Morrison	See first page
1	Why study fluids?	Morrison	All = 1.1, 1.2, stretch = Ch1
2,3	Fluid behavior, modeling	Morrison	All = Intro to Ch2, 2.1-2.4, 2.11, Intro to Ch3, 3.1, 3.2.1; Stretch = Ch 2&3
4,5	Fluid stresses	Morrison	All = 4.1, (4.3 lightly), 4.3.2; Stretch = Ch 4.2-4.3
6	Stress/velocity, microscopic balance equations, internal flows	Morrison	All = 5.1, 5.2, 5.4, 6.2, 6.3, 7.1, 7.2; Stretch = Ch 5,6,& 7
7,8	Stress/velocity, microscopic balance equations, internal flows	Morrison	All = 5.1, 5.2, 5.4, 6.2, 6.3, 7.1, 7.2; Stretch = Ch 5,6,& 7
9,10	Non-newtonian fluids, internal flows, correlations, dimensional analysis	Morrison	All = 5.3.1, 6.2, 6.3, 7.1, 7.2; Stretch = Ch 5,6,& 7
11	Macroscopic momentum balances	Morrison	All = 9.2, Stretch = Ch 9
12,13	External flows, dimensional analysis, boundary layers, compressible flows, numerical solutions	Morrison	All = 8.1, 8.2, 10.1-10.3, 10.6, 10.7; Stretch = Ch 8 & 10
14,15	Fourier's law, intro to heat transfer	Geankoplis, 4th ed.	All = 4.1, 4.2, 4.3; Stretch = Ch 4, Perry's Section 5
16,17	1D heat transfer, 2D heat transfer, unsteady state	Geankoplis, 4th ed.	All = 4.14, 5.1-5.3, 5.6; Stretch = Ch 4&5; Morrison 6.1.4, 9.1.3, Appendix D
18,19	Dimensional analysis; heat transfer coefficients (forced convection)	Geankoplis, 4th ed.	All = 4.5-4.7; Stretch = Ch 4&5; Perry's Section 11
20	Dimensional analysis (natural convection)	Geankoplis, 4th ed.	All = 4.5-4.7; Stretch = Ch 4&5; Perry's Section 11
21	Heat exchanger design/effectiveness/fouling	Geankoplis, 4th ed.	All = 4.9, 5.1-5.3; Stretch = Ch 4&5
22	Heat transfer with phase change, evaporators, radiation	Geankoplis, 4th ed.	All = 4.8, 4.10
23	Radiation	Geankoplis, 4th ed.	All = 4.10