# Reading Assignments CM3110
# Fall Semester
# Dr. Faith Morrison

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).
- 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).

| **Prerequisite topic review suggested readings: CM3110 Transport I Morrison** | | | |
|---|---|---|---|
| Mechanical energy balance | Felder and Rousseau | Ch 7.7 | pp 333-337 |
| | McCabe, Smith, Harriott | Ch 4 | pp 86-94 |
| | Morrison | Ch 1 | pp 8-93 |
| | Morrison | Ch 9 | pp 766-800 |
| | Geankoplis | Ch 2.7F | pp 67-71 |
| Fluid statics | Felder and Rousseau | Ch 3 | pp 54-59 |
| | McCabe, Smith, Harriott | Ch 2 | pp 31-44 |
| | Morrison | Ch 4.2 | pp 236-277 |
| | Geankoplis | Ch 2.1-2.2 | pp 34-42 |
| Pumps | McCabe, Smith, Harriott | Ch 8 | pp 202-206 |
| | Morrison | Ch 9 | pp 800-823 |
| | Geankoplis | Ch 3.3 | pp 144-149 |

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.

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| Readings for CM3110 Morrison | | | |
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| Week | Topics | Book | Sections |
| 0 | MEB, fluid statics, pumps | Morrison | See first page |
| 1 | Why study fluids? | | All = 1.1, 1.4, stretch = Ch1 |
| 2 | Fluid behavior, modeling | | All = 2.1-2.4, 2.11, 3.2,3.3<br>Stretch = Ch 2&3 |
| 3 | Fluid stresses | | All = 4.1, 4.3<br>Stretch = Ch 4 |
| 4 | Stress/velocity, microscopic balance equations, internal flows | | All = 5.1, 5.2, 5.4, 6.2, 6.3, 7.1, 7.2<br>Stretch = Ch 5,6,& 7 |
| 5 | Stress/velocity, microscopic balance equations, internal flows | | All = 5.1, 5.2, 5.4, 6.2, 6.3, 7.1, 7.2<br>Stretch = Ch 5,6,& 7 |
| 6 | Non-newtonian fluids, internal flows, correlations, dimensional analysis | | All = 5.1, 5.2, 5.3.1, 5.4, 6.2, 6.3, 7.1, 7.2<br>Stretch = Ch 5,6,& 7 |
| 7 | Macroscopic momentum balances | | All = 9.2,<br>Stretch = Ch 9 |
| 8 | External flows, dimensional analysis, boundary layers, compressible flows, numerical solutions | | All = 8.1, 8.2, 10.1-10.3, 10.6, 10.7<br>Stretch = Ch 8 & 10 |
| 9 | Fourier's law, intro to heat transfer | Geankoplis | All = 4.1, 4.2<br>Stretch = Ch 4, Perry's Section 5 |
| 10 | No class | | All = 4.3<br>Stretch = Ch 4 |
| 11 | 1D heat transfer, 2D heat transfer, unsteady state | | All = 4.14, 5.1-5.3, 5.6<br>Stretch = Ch 4&5; Morrison 6.1.4, 9.1.3, Appendix D |
| 12 | Dimensional analysis; heat transfer coefficients (forced convection) | | All = 4.5-4.7<br>Stretch = Ch 4&5; Perry's Section 11 |
| 13 | Heat transfer coefficients (natural convection) | | All = 4.8-4.9, 5.1-5.3<br>Stretch = Ch 4&5 |
| 14 | Heat transfer with phase change; evaporators, Radiation | | All = 4.10 |