ENGG 201 Winter 2017
Course Content Summary

The following is a summary of the topics that we have covered in ENGG 201. This list is intended only as a guide and may not be completely inclusive.

Chapter 1 (all)	Introduction
Chapter 2 (all)	Dimensions, units, conservation principles, energy
Chapter 4 (4.1-4.7.4)	Phases and composition, mole fraction, mass fraction, the Phase Rule, P-T diagrams, P-V diagrams, lever rule, miscible, partially miscible and immiscible systems, critical point, triple point, azeotrope, T-x diagrams
Chapter 5 (all)	PVT behaviour of ideal gases, ideal gas mixtures, kinetic theory of gases, molecular velocities, heat capacities, mean free path, viscosity, thermal conductivity, diffusivity, transport (flux) of heat, mass, momentum
Chapter 6 (all except 6.8.2)	PVT behaviour of real gases, equations of state (van der Waals, ~~virial equations, Dalton's law, Amagat's law~~, compressibility and corresponding states), real gas mixtures
Chapter 7 (7.2-7.3)	Volumetric behaviour of liquids, thermal expansion, compressibility (Tait's equation, van der Waals equation), heat capacity, latent heat of vaporization, Clausius-Clapeyron equation, vapour pressure data, Raoult's law
Chapter 8 (8.1-8.5.2)	Stress and strain in fluids, Newtonian and non-Newtonian fluids, viscosity, Bernoulli's equation, laminar flow, turbulent flow, Hagen-Poiseuille equation, velocity distribution, friction factor, power consumption
Chapter 3 (3.7-3.8)	~~Atoms, bonding~~, Lennard-Jones Potential, atomic and molecular dimensions, crystal structure (Bravais lattices), bulk density in cubic lattices, packing
Chapter 9 (9.2)	~~Structure of solids~~, heat capacity, heat conduction, thermal expansion, rate of heat conduction
~~*Chapter 10 (10.1-10.2)*~~	~~Stress and strain in solids, normal and shear stress, elastic deformation, Young's modulus, Poisson's ratio, bulk modulus for volume change, modulus of rigidity~~

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Test-Writing Strategy

Overall points to remember for Final Exam:

- Read the question carefully (30 seconds of reading can save you 10 minutes of answering the wrong question or forgetting to answer part of the question)
- Draw a Diagram
- Answer what is asked in the question
- Answer should make sense
- **UNITS, UNITS, UNITS!**
- Show your work to get part marks
- **Budget your time (10% of marks = 10% of time = 18 minutes)**
- Think outside the box – you may have to combine knowledge from different Chapters to answer one question

Problem-Solving Strategy:

1. Read the question carefully
2. Write down given (known) information (use symbols, units)
3. Write down what is being asked (X=?)
4. Write down key equations
5. When in doubt, write down definitions of important terms (i.e. Density = mass / volume, or Volumetric Flow = Volume / Time, etc.). These can be more key equations.
6. If you make assumptions (i.e. laminar flow), write them down (check at the end if possible)
7. Circle or underline your final answer

Winter 2017 Final Exam:

- Six (6) Questions
- ~20-25% from before the midterm / ~75-80% from after the midterm
- Material before midterm – what is important?
  - Ch 4 (~15%) / Ch 5 (~5-10%)
- Material after the midterm – what is important?
  - Ch 6 (~15%) / Ch 7 (~15%) / Ch 8 (~25%) / Ch 3 (~10-15%) / Ch 9 (~10%)