

G aded Componen :

Course Schedule

Week 1, 01/15 - 01/19 (Chapter 1)

- Lecture 1: Statics, introduction to mechanical analysis
- Lecture 2: Calibration of mechanical methods
- Lecture 3: Selecting analytical methods

Week 2, 01/22 - 01/26 (Chapter 2)

- Lecture 4: Ohm's and Kirchhoff's Laws, DC circuits
- Lecture 5: AC circuits, Capacitors
- Lecture 6: RC circuits

Week 3, 01/29 - 02/02 (Chapters 3 & 5)

- Lecture 7: Signal and noise (Problem 1 due)
- Lecture 8: Analog and digital filtering
- Lecture 9: Operational amplifiers, Lock-in amplification

Week 4, 02/05 - 02/09 (Chapters 6 & 7)

- Lecture 10: Characteristics of electromagnetic radiation
 - Lecture 11: General design of optical instruments, coherence of EM radiation
- Exam 1 (Chapter 1-5)**

Week 5, 02/12 - 02/16 (Chapter 7)

- Lecture 12: Wave length, electric (Problem 2 due)
 - Lecture 13: James Clerk Maxwell's equations, electromagnetic waves
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Week 9, 03/11 - 03/15

Spring break, no class

Week 10, 03/18 - 03/22 (Chapters 16 - 18)

- Lecture 20: Fourier Transform IR in Raman scattering (Problem Set 3 due)
- Lecture 21: Sample handling, Attenuated Total Reflectance (ATR) IR
- Lecture 22: Introduction to Raman spectroscopy

Week 11, 03/25 - 03/29 (Chapters 17 & 18)

- Lecture 23: Raman scattering: considerations, polarized measurements
- Lecture 24: Fields of Raman spectroscopy (i.e., SERS, Resonance Raman, SRS/CARS)
- Lecture 25: Applications of Raman and IR spectroscopy

Week 12, 04/01 - 04/05 (Chapter 19)

- Lecture 26: Introduction to NMR spectroscopy
 - Lecture 27: Environmental effects on chemical shift
- Exam 3 (Chapters 16 - 18)

Week 13, 04/08 - 04/12 (Chapter 19)

- Lecture 28: Spin-spin coupling, indirect coupling (Problem Set 4 due)
- Lecture 29: NMR in membranes
- Lecture 30: NMR applications

Week 14, 04/15 - 04/19 (Chapter 20)

- Lecture 31: Introduction to molecular mass spectrometry, mass analysis
- Lecture 32:

Exam 5 (Chapters 20, 26-28) on 05/06 at 07:30 am in Voice 305 (subject to change)