# LECTURE/DISCUSSION SCHEDULE

<table>
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<tr>
<th>SESSION</th>
<th>DATE</th>
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<td>1</td>
<td>30 Aug &amp; 1 Sept</td>
<td>Introduction, History, Resolution, Information Content, LM &amp; EM, Optics, &amp; Safety - Chapters 1 &amp; 21</td>
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<td>6 September</td>
<td>Vacuum System &amp; Electron Beam - 180-188, 163-173</td>
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<td>3</td>
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<td>Transmission Electron Microscope Chapter 6</td>
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<td>Scanning Electron Microscope Chapter 7</td>
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<td>Ultramicrotomy Chapter 4</td>
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<td>4 October</td>
<td>Preparation of Biological Materials for Transmission Electron Microscopy - Chapter 2</td>
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<td><strong>NO LECTURE</strong> - Fixing Specimens in the Laboratory</td>
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<td>EXAM 1</td>
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<td>The Electron Micrograph &amp; Its Interpretation Chapters 8, 19, &amp; 20</td>
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<td>8</td>
<td>1 November</td>
<td>Preparation of Biological Materials for Scanning Electron Microscopy - Chapter 3</td>
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<td>Ultramicrotomy, Staining, &amp; Contrast - Chapters 4 &amp; 5</td>
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<td>Cytochemistry &amp; Autoradiography - Cpts 9, 10, 12, 17, &amp; 11</td>
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<td>Freeze-Fracture and Intermediate &amp; High Voltage EM Chapters 14 &amp; 16</td>
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<td>6 December</td>
<td>Quantitative and Analytical Electron Microscopy Chapters 13 &amp; 15</td>
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<td>Scan Probe Microscopy and Review</td>
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<td>15</td>
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<td>EXAM 2 (10:00-11:30) to be held in Room 245</td>
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</table>

All reading assignments from: Bozzola & Russell 1999. Electron Microscopy
Session 1
Introduction
- History - 11-12, chapter 1
- Resolution & magnification - 6, 150-151, 155, 212
- Information content
- LM & EM optics - 163
- Safety - chapter 21

Session 2
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- Electron gun & electron beam - 163-173

Session 3
Chapter 6 - Transmission Electron Microscope
- Electromagnetic radiation & resolution - 151-156
- Alignment of the TEM - 188-191
- Contrast - 192-193
- Magnification & calibration - 197-198
- Resolution - 199-200
- Astigmatism - 466, 472
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Session 4
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- Intro. & management of the electron beam - 204-213
- Interaction of electron beam with the specimen - 213-214, 370-371, 380
- Signal processing & signal-to-noise ratio - 214-219
- Imaging other types of specimen signals - 225-233
- Alignment of the SEM - 234-236
- Magnification & calibration - 236-238
- Resolution - 212-213, 236-238
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Session 5
Chapter 4 - Ultramicrotomy
- Trimming of the block - 76-79
- Preparation of the knife - 82-88
- Use of the ultramicrotome - 97-103
- Handling sections - 90-92, 103-106
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Session 6
Chapter 2 - Specimen Preparation for TEM
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- Wash, dehydration & transitional solvent - 34-35
- Embedding & curing embedment - 36-43
- Rapid tissue processing protocols - 44
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Session 7
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- Photographic principles - 242-246
- Photographic negatives - 246-250
- Photographic presentation - 256-260
- Other

Chapter 19 - Interpretation of Electron Micrographs
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Chapter 20 - Biological Ultrastructure - 478-614

Session 8
Chapter 3 - Specimen Preparation for SEM
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- Air drying - 58
- Critical point drying - 54-56
- Freeze-drying - 56-58
- Replication/casting - 61-63
- Specimen coating - 65-68, 135-145
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Session 9
Chapters 4 & 5 Ultramicrotomy, Staining, & Contrast
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Session 10
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- Finder strategies - 268-273
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- Necessary conditions for success - 284-287
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- Examples - 410-413

Chapter 11 - Autoradiography/Radiography
- Autoradiography and radioactive decay - 294-296
- How to perform autoradiography - 296-302

Session 11
Chapter 14 - Freeze Fracture Replication
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Chapter 16 - Intermed. & High Voltage EM - 398-404

Session 12
Chapter 13 - Quantitative Electron Microscopy
- Quantitative electron microscopy - 322-325
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Chapter 15 - Analytical Electron Microscopy
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- Electron diffraction - 386-390
- Other

Session 13
Scan Probe Microscopy & Review