LAB 1: Introduction to A&P and the Microscope
Units 1 and 3
Unit 1: Introduction to Anatomy & Physiology (p. 1 - 30)

Exercise 1-1: Anatomical Terms, p. 5

Anatomical terms (based on anatomical position):

Directional Terms:
- Superior – Inferior
- Anterior - Posterior
- Medial – Lateral
- Proximal – Distal
- Superficial – Deep
- Parietal – Visceral

Body Regions:
- Abdominal
- Antebrachial
- Axillary
- Brachial
- Calcaneal
- Cephalic
- Cervical
- Cranial
- Femoral
- Frontal
- Lumbar
- Nasal
- Occipital
- Pelvic
- Scapular
- Sternal
- Tarsal
- Thoracic
- Umbilical
- Vertebral

Exercise 1-2: Body Cavities and Membranes, p.10

Major Body Cavities:

1) Dorsal Cavity
   - Cranial cavity
   - Vertebral (spinal) cavity
2) Ventral Cavity
   Thoracic cavity
   Pleural cavity
   Mediastinum
   Pericardial cavity
   Abdominopelvic cavity
   Abdominal cavity
   Pelvic cavity

Serous Membranes:
   Pleural: Visceral & Parietal
   Pericardial: Visceral & Parietal
   Peritoneal: Visceral & Parietal

4 quadrants:

9 abdominopelvic regions:

Exercise 1-3: Planes of Sections, p. 18

Sectional Anatomy:

Sagittal
   Mid-sagittal
   Parasagittal
Coronal (frontal)
Transverse
Oblique
Unit 3: Introduction to Cells and Microscope

Exercise 1-4: Organs and Organ Systems, p. 20

- Integumentary
- Skeletal
- Muscular
- Nervous
- Endocrine
- Cardiovascular
- Lymphatic
- Respiratory
- Digestive
- Urinary
- Reproductive

Exercise 3-1: Introduction to the Microscope (p. 47-51)

Parts:

- Arm
- Base
- Lamp (light source)
- Stage
- Mechanical stage
- Ocular lens
- Objective lenses
- Iris diaphragm
- Nosepiece
- Coarse adjustment knob
- Fine adjustment knob
Terms:

- Resolution
- Working distance
- Field of view
- Parfocal
- Depth of Field

Magnification vs. Total Magnification

<table>
<thead>
<tr>
<th>Objective lens</th>
<th>Magnification</th>
<th>(Objective x Ocular)</th>
<th>Total Magnification</th>
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<tr>
<td>Scan</td>
<td>4x</td>
<td>4 x 10</td>
<td>40</td>
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<td>High</td>
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<tr>
<td>Oil</td>
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Slides:

- "e"
  - crossed threads
- wet mount of hair
- wet mount of cheek cells
- live specimen (Paramecium/ Euglena)
**Lab 2: Diffusion, Osmosis, Tonicity**

Unit 3: Intro. to the Cell (p. 56-60)

**Exercise 3-3: Diffusion, p. 56**

Def.:

Experiment 1: Diffusion in liquid (Groups of 4)
Observation of MeBlue in water:

Experiment 2: Diffusion in a semi solid medium (Groups of 4)
- petri dish with agar
- remove two small plugs of agar with a straw
- place KMnO₄ (MW 158g) and MeBlue (MW 320g) within each well

Observation of the diffusion rate vs. molecular weight:

Experiment 3: Diffusion and Membrane Permeability (Groups of 4)
Color of solution in beaker:

Color of solution in dialysis bag:

IKI (iodine) \( \rightarrow \) test for __________

positive test = __________

**Exercise 3-4: Osmosis and Tonicity, p. 58**

Def.:

Experiment 4: Thistle tube osmometer (DEMO)

Molasses in thistle tube

Water in beaker
Experiment 5: Osmosis and living cells - red blood cells (Groups of 4)

Observe (under the microscope) RBCs in each of the following solutions:

0.9% NaCl  100% dH₂O  10% NaCl

Which solution was hypotonic? Explain.

Which solution was isotonic? Explain.

Which solution was hypertonic? Explain.

Did you observe hemolysis or crenation? Where?

Filtration (Groups of 4)

Def.:

Experiment 6:

Pour solution of copper sulfate, charcoal, and starch through filter paper in a funnel over an empty beaker.

Which passes through the filter paper into the beaker? Explain why or why not.

Copper sulfate:

Charcoal:

Starch:
Lab 3: Cell Division and Epithelial & Connective Tissue
Units 3, 16, and 4

Unit 3: Introduction to the Cell (p. 61-64)
Unit 16: Reproductive Systems (p. 415-418)
Unit 4: Histology: The Tissue Level of Organization (p. 71-83)

Exercise 3-5: Mitosis and Cell Cycle, p. 61

Cell Cycle = Interphase + Mitosis
Interphase:
- G₀:
- G₁:
- S:
- G₂:

Mitosis (M phase):
- Prophase:
- Metaphase:
- Anaphase:
- Telophase:

Slide: Whitefish blastula

Exercise 16-3: Meiosis, p. 415
Exercise 16-4: Spermatogenesis and Oogenesis, p. 417

Spermatogenesis

Oogenesis

Slides:
- Testis
- Sperm
- Ovary
Unit 4: Tissues (p. 71 – 83)

Four main tissue types: _______________ _______________
_____________ _______________

Exercise 4-1: Epithelial Tissue, p.72

Epithelial tissue:

Know characteristics, functions, and locations for each tissue type. Make a sketch of each cell type as you go through each of the slides.

Simple squamous:
  Slide: Lung

  Mesothelium

Simple cuboidal:
  Slide: Kidney (tubules)

Simple columnar:
  Slide: Villi of small intestines

  Goblet cells

Stratified Squamous:
  Slide: Esophagus

  Skin – Palmer (epidermis)

Pseudostratified ciliated columnar: PSCCE
  Slide: Monkey trachea

Transitional:
  Slide: Transitional (urinary bladder)

Exercise 4-2: Connective Tissue, p. 78

Connective Tissues:

Adipose (Fat):
  Slide: Adipose

Dense irregular CT:
  Slide: Skin (dermis)
Lab 4: Integumentary System
Unit 5: Integumentary System (p.95-104)

Exercise 5-1: Skin Anatomy & Accessory Structures, p. 97

Regions of Cutaneous Membrane: Functions:

- Epidermis
- Dermis

**Epidermis**

  Tissue type:

  - 5 specific cell layers: Stratum corneum
    - (or strata) Stratum lucidum {thick skin only}
    - Stratum granulosum
    - Stratum spinosum
    - Stratum basale

**Dermis**

  Tissue type:

  - 2 specific layers: Papillary layer
    - Reticular layer

**Hypodermis**

  Tissue type:

  - No specific layers.

  Not considered a region of the integument!
Exercise 5-2: Histology of Integument, p. 100

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<th>Slide #2:</th>
<th>Skin Model</th>
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<tbody>
<tr>
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<td>Scalp [Thin skin]</td>
<td>Identify: All terms listed for slides plus:</td>
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<td>Identify: Regions</td>
<td>Identify: Regions</td>
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<th>Regions</th>
<th>Specific layers</th>
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