Introductions

- Note cards
  - Name
  - Year you graduated HS and where
  - Career goal
  - List of classes you have taken that may help prepare you for A&P and WHEN you took them (e.g. BIO 101, Fall'09)
  - List any other relevant experience you’ve had (job, internship, taking care of relatives, etc.).
  - Your preferred email address

Syllabus highlights

- Class meets:
  - **Sat** 8:30AM - 3:00PM in AS 1615

  Quarter ends Friday, June 18 so no class the final week.

Contact info

- Email: jdahms@sccd.ctc.edu
  - email is the best way to contact me
- Office Phone: 206.526.2004 (Voice mail only)
- Office hours: by appointment

Course website

The website has:
- Syllabus
- Lecture notes
- Objectives (learning goals/study aids) for each unit
- Resources to help you study

Course Website:
http://facweb.northseattle.edu/jdahms/biol241/
Required texts:


Required texts:


Grading

Breakdown:

- Exams 400 points
- Lab Practical Quizzes 200 points
- Lab Reports & Assigns 200 points

Total 800 points

Grades

Your grade = points you earn

800 points
Grade percentages

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
<th>Description</th>
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<td>90 - 100%</td>
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<td>B+/ B</td>
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<td>B-/ C+</td>
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<td>D+/ D</td>
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Commitment

- This is a very difficult class that requires learning what is essentially a new language.
- Because it is a prerequisite, the class is designed by the college as an overview: lots of breadth, little depth.
- Expect 20+ hours of reading and studying each week in addition to class sessions.
- The pace is a little frantic so missing class is not recommended. Saturday class especially!

Exams

- First 4 exams:
  - taken during class
  - 75 points each
  - 1 hour+
- Final (Exam 5):
  - NOT cumulative
  - 100 points
  - Due on Friday of finals week (June 18)

Exams

Five exams:

- 4/24 Exam 1 (Chaps 1-3)
- 5/1 Exam 2 (Chaps 4, 5)
- 5/15 Exam 3 (Chaps 6, 7)
- 5/29 Exam 4 (Chaps 8 -10)
- 6/18 Exam 5 due (Chaps 11 - 15)

Exams

- A little more than half objective questions: multiple-choice, matching, true/false
- The rest: fill-in-the-blank, short answer, short essay, and diagram labeling
- You will need a Scantron form and a #2 pencil for each exam.
- Not cumulative per se

Exams

- Exams may not be rescheduled or made-up due to tardiness or absence. Students with extraordinary circumstances should discuss them with the instructor as soon as the situation occurs.
- If you know ahead of time that you will miss an exam for a valid reason, I may be able to accommodate you but let me know as far ahead of time as possible.
Lab Practical Quizzes

- Four, each worth 50 points
- Cover the material on the “Lab Practical Study Guide” in the syllabus
- They will involve identifying slides, projected pictures of slides, bones, muscle models, brain models, or diagrams
- Because of the time required to set up these quizzes, they cannot be made up. If you miss it, you are out of luck.

Lab Practical Quizzes

5/8 Practical 1: Histology
5/22 Practical 2: Bones
6/5 Practical 3: Muscles
6/12 Practical 4: Nervous

Lab Reports and Assignments

- Total of 200 points

Lab Reports

- For each lab assigned, complete all the questions on the lab manual “Review Sheet” at the end of each lab entitled and turn it in to me the week following each lab. **NOTE: you must turn in the actual pages torn out of a laboratory manual; no photocopies will be accepted.** You must also include any data obtained from the lab exercise or drawings of microscope slides.

Assignments

- In class group work or individual take-home
- 2-3 depending on timing

Lectures

- Lecture slides available on course website before lecture (all are posted now)
- Do not cover ALL the material on exams (but the vast majority comes from the lectures)
- “Objectives” for each unit will be posted on the website at the beginning of each unit. These are a general idea of what you should know for the exams.
Saturday class
- The Saturday class is one week shorter than the other classes
- This causes some scheduling issues that mean that the timing of the exams and practicals is not always optimal
- Also as a result, we will have to skip some portions of the lecture; you will still be responsible for the material on the exam
- Use the objectives as your guide for studying the notes

Example day:
- Lecture 8:30 -9:30
- Break 9:30-9:40
- Lecture 9:40-10:40
- Break 10:40-10:50
- Lab 10:50-12
- Lunch 12-12:45
- Lab 12:45-2:00
- Lecture or activity 2:00-3:00

Objectives
- List of learning goals that need to be achieved for you to do well in this class
- Contain what the I and other teachers at NSCC have deemed to be the most important things for you to know to go on in a health-related career
- Available on the course website

Attendance
- Students should try to attend every class session. If you miss a class session, it is your responsibility to obtain the lecture notes, to make up laboratory experiments and to obtain handouts, assignments or other materials distributed in class. ESPECIALLY because we meet only once a week.

Labs
- Many laboratory exercises must be completed in the laboratory. Students who miss a laboratory exercise should come in during open lab time to make up that exercise
- Lab exercises will be due the following week
Introduction to the Human Body

Anatomy

- "tome" means to cut in Greek
- Describes the **structures** of the body:
  - what they are made of
  - where they are located
  - associated structures

Physiology

- Is the study of:
  - **functions** of anatomical structures, both individual and cooperative

**KEY CONCEPT**

- All physiological **functions** are performed by specific anatomical **structures**
- Principle of complementarity says that **structure** and **function** are complementary
  - Function always reflects structure
  - What a structure can do depends on its specific form
Introduction

- Key to learning anatomy is understanding function
  - For example:
    - Left side of heart is larger than right.
  - Why is that?

Structure (anatomy) and function (physiology) are intimately related

Gross Anatomy

- Structures large enough that one can see with the unaided eye
  - Surface Anatomy - study of superficial markings
  - Regional Anatomy - The study of specific areas of the body (e.g. head, trunk)
  - Systemic Anatomy - Study of the 11 specific organ systems

11 Organ systems

Integumentary*
Nervous*
Skeletal*
Endocrine
Muscular*
Cardiovascular

Lymphatic
Urinary
Respiratory
Reproductive
Digestive

Microscopic Anatomy

- Cf. Gross anatomy
- Involves studying anatomical structures that cannot be seen with the unaided eye
  1. Cytology - cells
  2. Histology - tissue

Physiology = Function

- Considers the operation of specific organ systems
  - Renal – kidney function
  - Neurophysiology – workings of the nervous system
  - Cardiovascular – operation of the heart and blood vessels
- Focuses on the functions of the body, often at the cellular or molecular level

Anatomical Organization

- We will start from the smallest and finish with the largest
Levels of Organization

- **Chemical Level**: atoms (e.g., carbon) combine to form molecules (e.g., glucose)
- **Cellular level**:
  - Smallest living units in organisms
  - Cells contain organelles, each with a function
- **Tissue level**: different groups of cells that perform a function
- **Organ Level**: different types of tissues that perform a common function
- **Organ system**: consists of different organs that work closely together

Other Levels

- **Organismal Level**: all systems working together (e.g., humans)
- **Ecological level**: how organisms interact with each other and their environment

Homeostasis

- **Homeostasis**: ability to maintain a relatively stable internal environment in an ever-changing outside world
- All body systems working together maintain a stable internal environment, respond to external and internal changes to function within a normal range (body temperature, fluid balance)
- The internal environment of the body is in a dynamic state of equilibrium
- Failure to function within a normal range results in disease

Levels of Structural Organization

KEY CONCEPT

- The body is divided into 11 organ systems
- All organ systems work together → Integration

Homeostatic Control Mechanisms

- Variables produce a change in the body
- The three interdependent components of control mechanisms:
  - **Receptor** – monitors the environments and responds to changes (stimuli).
  - **Control center** – determines the set point at which the variable is maintained.
  - **Effector** – provides the means to respond to stimuli.
Regulation

- Most regulatory systems in the body use extrinsic regulation:
  - responses controlled by nervous and endocrine systems, e.g. brain regulates body temp
- Usually occurs by negative feedback which can be modeled as a thermostat:

Negative Feedback

- Most common way that homeostasis is maintained in the body
- In negative feedback systems the response of the effector negates or opposes the stimulus (shuts off the original stimulus)
- Example: Regulation of room temperature

Negative Feedback: Maintaining Normal Limits

Thermostat model
Positive Feedback

- **NOT** a way to maintain homeostasis
- Rare in nature because it is a “runaway train”
- The response of the effector output reinforces or exaggerates the stimulus (e.g., blood clotting, ovulation, action potential)

Homeostatic Imbalance

- Disturbance of homeostasis or the body’s normal equilibrium
- Overwhelming the usual negative feedback mechanisms allows destructive positive feedback mechanisms to take over
- This is often used as the definition of “disease”

Anatomical Position

- Hands at sides, palms forward

Orientation of terms

- Note that Left/Right are reversed in anatomical figures
- WHY?

Directional Terms

- **Superior** and **Inferior** – toward and away from the head, respectively
- **Anterior** and **Posterior** – toward the front and back of the body
- **Medial** and **Lateral** – toward the midline, away from the midline
- **Proximal** and **Distal** – closer to and farther from the origin of the body part (or from the torso)
- **Superficial** and **Deep** – toward and away from the body surface
- **Cranial** and **Caudal** – toward the head and toward the tail
**Alternate Terms**
- Ventral (= Anterior)
- Dorsal (= Posterior)

**Body Planes**
- Sometimes to gain a greater understanding of 3D images anatomists cut the image at different planes
- Three planes exist in 3D space
  - Two are parallel to the long axis of the body
  - One is perpendicular to the long axis.

**Body Planes**
- **Sagittal** – parallel to long axis, divides the body into right and left parts
  - midsagittal or medial – sagittal plane that lies on the midline
- **Frontal or coronal** – also parallel to long axis, divides the body into anterior and posterior parts
- **Transverse or horizontal** (cross section) – perpendicular to long axis, divides the body into superior and inferior parts

**Anatomical Variability**
- Humans vary slightly in both external and internal anatomy
- Over 90% of all anatomical structures match textbook descriptions, but:
  - Nerves or blood vessels may be somewhat out of place
  - Small muscles may be missing
- Extreme anatomical variations are seldom seen
Body Cavities

- **Dorsal cavity** protects the nervous system, and is divided into two subdivisions
  - Cranial cavity – within the skull; encases the brain
  - Vertebral cavity – runs within the vertebral column; encases the spinal cord
- **Ventral cavity** houses the internal organs (viscera), and is divided into two subdivisions
  - Thoracic
  - Abdominopelvic

Ventral Body Cavity Membranes

- Called **serous membranes** or serosa
  - Parietal serosa lines internal body walls
  - Visceral serosa covers the internal organs
  - Serous fluid separates the serosae

Heart Serosae

- Parietal pericardium
- Pericardial space with serous fluid
- Visceral pericardium

Serous Membrane Relationship

- Outer balloon wall (comparable to parietal serosa)
- Air (comparable to serous cavity)
- Inner balloon wall (comparable to visceral serosa)

SUMMARY

- Structure and function in anatomy and physiology
- Levels of physical organization
- Homeostasis and feedback
- Systems integration and equilibrium
- Anatomical terms
- Locations and functions of major cavities
- Serous membranes in the ventral body cavity