Department of Kinesiology
San José State University

KIN 154A
Instrumentation in Exercise Physiology & Biomechanics
Fall 2014

Instructor: Peggy Plato, Ph.D. Jim Kao, Ph.D.
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Other times available by appointment Tu: 7:30 – 8:15 am by appointment
• Send email to reserve an
  appointment time
Other times available
• Send email to request a non-
  office hour appointment time

Class Days/Time
Sec 1 (Lecture) M 9:30 am - 10:20 am
Sec 2 (Lab) MW 10:30 am - 12:20 pm
Sec 3 (Lab) MW 12:30 pm - 2:20 pm
Classroom: YUH 233 (exercise physiol half); YUH 233 & MQH 321 (biomech half)
Prerequisites: KIN 70, 155, 158 with grades of C- or better; Human Anatomy & Physiology,
Introductory Chemistry, GE Math

Course Description
This class is designed to assist the student in becoming familiar and proficient with the methods and
instruments of assessing physiological and biomechanical characteristics of human performance.

Kinesiology Undergraduate Major Program Learning Objectives (KIN PLOs)

At the end of a Bachelor of Science degree program in the Department of Kinesiology, students should expect:

(1) to obtain a critical understanding and the ability to apply theoretical and scientific knowledge from
the subdisciplines in kinesiology for personal fitness, healthy lifestyles, sport, and/or therapeutic
rehabilitation.
(2) to effectively communicate the essential theories, scientific applications, and ethical considerations
related to kinesiology.
(3) to apply scholarship and practice of different movement forms to enhance movement competence in
kinesiology.
(4) to recognize and apply sustainable approaches as they relate to kinesiology.
(5) to identify social justice and equity issues related to kinesiology for various populations.

1
Course-Specific Student Learning Outcomes (SLOs)

Upon successful completion of the course, students will:

**Exercise Physiology**

1. demonstrate knowledge of instruments and procedures used in physiological testing. (KIN PLO 2)
2. demonstrate proficiency in administering selected physiological tests. (KIN PLO 1)
3. interpret and explain test results. (KIN PLO 1, 2)
4. demonstrate knowledge of the underlying principles, benefits, and limitations of selected physiological tests. (KIN PLO 1, 5)
5. demonstrate sensitivity to age, gender, cultural, and other individual differences as they relate to the physiological assessment of human performance. (KIN PLO 1, 5)
6. demonstrate critical thinking and problem solving skills. (KIN PLO 1)

**Biomechanics**

7. demonstrate knowledge and use of equipment and procedures to collect acceleration data.
8. demonstrate proficiency in analyzing and interpreting acceleration data.
9. demonstrate knowledge and use of equipment and procedures to collect video/kinematic data.
10. demonstrate proficiency in analyzing and interpreting video/kinematic data.
11. demonstrate knowledge and use of equipment and procedures to collect electromyographic (EMG) data.
12. demonstrate proficiency in analyzing and interpreting electromyographic (EMG) data.
13. utilize accelerometers, video cameras, and EMG equipment to analyze real-world movements (jumping, walking, running, stair climbing & descending, etc.) for effectiveness and efficiency.

**Methods**

1. Lecture/discussion
2. Demonstration
3. Observation
4. Assigned readings
5. Laboratory experience - emphasis on hands-on practice to develop competence

**Course Content**

1. Anthropometry & body composition
   (a) Height, weight, circumferences, and bone diameters
   (b) Bioelectrical impedance analysis (BIA)
   (c) Skinfold measurements
   (d) Hydrostatic weighing
   (e) Air displacement plethysmography (Bod Pod)
   (f) Dual-energy X-ray absorptiometry (DXA)
2. Pulmonary function
   (a) Spirometry: static and dynamic lung volumes
   (b) Environmental conditions
   (c) Residual volume: measuring and estimating
3. Fitness & health assessments - Trifit system, Cholestech
(4) Qualitative and quantitative movement analysis – video & acceleration data

(5) Miscellaneous topics
(a) Equipment calibration and operation
(b) Selection of tests
(c) Equipment specifications
(d) Analysis and interpretation of results

Evaluation

The final course grade will be determined 50% from the exercise physiology unit and 50% from the biomechanics unit.

Calculating Grades

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>A+</td>
<td>97-100%</td>
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<tr>
<td>A</td>
<td>93-96%</td>
</tr>
<tr>
<td>A-</td>
<td>90-92%</td>
</tr>
<tr>
<td>B+</td>
<td>87-89%</td>
</tr>
<tr>
<td>B</td>
<td>83-86%</td>
</tr>
<tr>
<td>B-</td>
<td>80-82%</td>
</tr>
<tr>
<td>C+</td>
<td>77-79%</td>
</tr>
<tr>
<td>C</td>
<td>73-76%</td>
</tr>
<tr>
<td>C-</td>
<td>70-72%</td>
</tr>
<tr>
<td>D+</td>
<td>67-69%</td>
</tr>
<tr>
<td>D</td>
<td>63-66%</td>
</tr>
<tr>
<td>D-</td>
<td>60-62%</td>
</tr>
<tr>
<td>F</td>
<td>&lt;60%</td>
</tr>
</tbody>
</table>

Requirements

• Consistent with SJSU guidelines, it is expected that students will spend a minimum of 45 hours for each unit of credit (normally three hours per unit per week), including preparing for class, participating in course activities, completing assignments, etc.

! Textbooks

Biomechanics


Chapter and Lecture Handouts: Available on my website
Laboratory Handouts: Available on my website

Exercise Physiology


Course reader — available mid-semester from Maple Press

• Battery-operated calculator
Professionalism, Care of Equipment

This is a professional preparation course. Students are expected to:

• **Be fully prepared**; actively and enthusiastically participate in all laboratory sessions and class discussions.

• **Read assigned material and lab instructions BEFORE class.** (Lecture and lab time will be used to present material, help students master techniques, and check competencies. Students are directed to the green sheet and course reader for answers to many of their procedural questions.)

• Bring textbook, calculator, course reader, and other necessary supplies to class.

• Dress appropriately for scheduled activities.

• Participate in demonstrations and data collection.

• Enthusiastically serve as a client for others.

• PRACTICE, PRACTICE, PRACTICE techniques. **Use your class time effectively!** Ask for guidance from instructor if having difficulty mastering a technique.

• Complete competencies and assignments on time.

• Use equipment properly; clean and put away all equipment before leaving lab area.

• Keep lab clean. No food or drinks are allowed in the lab, except water.

Students who consistently demonstrate professionalism, as described above, WILL be able to complete all lab assignments and competencies in a timely manner. Students who choose not to use laboratory time effectively may not complete all assignments, and should not expect the instructor to ensure that they do. **In an 8-week, lab-intensive class, if you fall behind it may be impossible to catch up.**

The most effective class results when EACH class member makes an INDIVIDUAL COMMITMENT to be an active participant in the teaching/learning process. Individual contributions and differing viewpoints will be appreciated and respected. Students are responsible for material presented and announcements made in each class. Students who miss class (a rare occurrence!) are responsible for obtaining material from another student BEFORE seeing the instructor about content missed.

University Policies

Academic Integrity

The University’s Academic Integrity Policy is available at [http://www.sjsu.edu/studentconduct/docs/Academic_Integrity_Policy_S07-2.pdf](http://www.sjsu.edu/studentconduct/docs/Academic_Integrity_Policy_S07-2.pdf).

Your own commitment to learning, as evidenced by your enrollment at San José State University and the University’s integrity policy, require you to be honest in all your academic course work. Faculty members are required to report all infractions to the Office of Student Conduct and Ethical Development, located at [http://www.sjsu.edu/studentconduct/](http://www.sjsu.edu/studentconduct/). Plagiarism and cheating are serious offenses. Students should carefully read the attached information on academic integrity and plagiarism.

Campus Policy in Compliance with the American Disabilities Act

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 requires that students with disabilities requesting accommodations must register with the Accessible Education Center at [http://www.sjsu.edu/aec/](http://www.sjsu.edu/aec/) to establish a record of their disability. The AEC is located in ADM 110 (408-924-6000 [voice] or 408-924-5990 [TDD]).
Adding, Dropping, Late Withdrawals, and Incompletes

September 5 is the last day to drop this course without a “W” being assigned. According to University policy, dropping this course after Sept. 5 is permissible only for serious and compelling reasons, and requires written documentation. Unsatisfactory performance in course work is not a serious and compelling reason. The last day to add the course is Sept. 12. However, students who receive add codes should use them as soon as possible. The university policies on late withdrawals and incompletes will be strictly followed.

Recording in Class

Common courtesy and professional behavior dictate that you notify individuals when you are recording them. You must obtain the instructor’s permission to make audio or video recordings in this class. Such permission allows the recordings to be used for your private, study purposes only. The recordings are the intellectual property of the instructor; you have not been given any rights to reproduce or distribute the material. Recording any students during class activities requires permission of those individuals as well as permission from the instructor.

Course Materials

Course material developed by the instructor is the intellectual property of the instructor and cannot be shared publicly without his/her approval. You may not publicly share or upload instructor generated material for this course, such as exam or quiz questions, lecture notes, or hand-outs, without instructor consent.
ACADEMIC INTEGRITY

The following information on academic integrity has been excerpted from the San José State University Academic Integrity Policy (policy S07-2). The complete policy is available at http://www.sjsu.edu/senate/docs/S07-2.pdf

SAN JOSE STATE UNIVERSITY ACADEMIC INTEGRITY POLICY

The University emphasizes responsible citizenship and an awareness of ethical choices inherent in human development. Academic honesty and fairness foster ethical standards for all those who depend upon the integrity of the university, its courses, and its degrees. University degrees are compromised and the public is defrauded if faculty members or students knowingly or unwittingly allow dishonest acts to be rewarded academically. This policy sets the standards for such integrity and shall be used to inform students, faculty and staff of the university’s Academic Integrity Policy.

STUDENT ROLE

The San José State University Academic Integrity Policy requires that each student:

1. Know the rules that preserve academic integrity and abide by them at all times. This includes learning and abiding by rules associated with specific classes, exams and course assignments.
2. Know the consequences of violating the Academic Integrity Policy.
3. Know the appeal rights, and the procedures to be followed in the event of an appeal.
4. Foster academic integrity among peers.

1.0 DEFINITIONS OF ACADEMIC DISHONESTY

1.1 CHEATING

San José State University defines cheating as the act of obtaining or attempting to obtain credit for academic work through the use of any dishonest, deceptive, or fraudulent means. Cheating includes:

1.1.1. Copying, in part or in whole, from another’s test or other evaluation instrument including homework assignments, worksheets, lab reports, essays, summaries, quizzes, etc.;

1.1.2. Submitting work previously graded in another course without prior approval by the course instructor or by departmental policy;

1.1.3. Submitting work simultaneously presented in two courses without prior approval by both course instructors or by the department policies of both departments;

1.1.4. Using or consulting sources, tools or materials prohibited by the instructor prior to, or during an examination;
1.1.5. Altering or interfering with the grading process;

1.1.6. Sitting for an examination by a surrogate, or as a surrogate;

1.1.7. Any other act committed by a student in the course of their academic work that defrauds or misrepresents, including aiding others in any of the actions defined above.

1.2 PLAGIARISM

San José State University defines plagiarism as the act of representing the work of another as one's own without giving appropriate credit, regardless of how that work was obtained, and submitting it to fulfill academic requirements.

Plagiarism includes:

1.2.1 Knowing or unknowingly incorporating the ideas, words, sentences, paragraphs, or parts of, or the specific substance of another's work, without giving appropriate credit, and representing the product as one's own work;

1.2.2 Representing another's artistic/scholarly works such as musical compositions, computer programs, photographs, paintings, drawing, sculptures, or similar works as one's own.

2.0 NOTIFICATION OF STANDARDS OF DETECTING PLAGIARISM

San José State University or its faculty may subscribe to or use plagiarism detection services.

Any plagiarism detection service with which San José State University contracts shall ensure the anonymity of all submitted work to third parties.

Except for the stated purpose of storing submitted work in databases solely for the intended purpose of detecting plagiarism, any plagiarism detection service with which San José State University contracts shall, to the fullest extent possible, agree to assure that ownership rights of all submitted work shall remain with the work's author and not with the plagiarism detection service.
Biomechanical Instrumentation

50 points are available
a) Labs (20% - 10 points)
b) Quizzes (20% - 10 points)
c) Lab Practical Exam (20% - 10 points)
d) Biomechanics Concepts Exam (20% - 10 points)
e) Biomechanical Modeling Exam (20% - 10 points)
f) Make-up Labs and Quizzes are NOT permitted
g) Make-up exams are permitted ONLY for serious and compelling reasons.

Course Content Knowledge Examinations (PLO 1; PLO 2; PLO 3; SLO 7; SLO 9; SLO 11)
1) Biomechanical Concepts Exam
   a. Multiple Choice questions related to course content knowledge
2) Biomechanical Modeling Exam
   a. Written assessment of your ability to use course content knowledge in real-world settings to enhance movement performance, prevent injuries, and assess rehabilitation progress.
3) Lab Practical Exam
   a. Quantitative and qualitative assessment of your ability to use course content knowledge, data collection methods, and data analysis methods in real-world settings to enhance movement performance, prevent injuries, and assess rehabilitation progress.
      i. Collect and analyze acceleration data
      ii. Collect and analyze video/kinematic data
      iii. Interpret acceleration data
      iv. Interpret video/kinematic data
4) All course content exams are cumulative
5) No Scantrons or Blue Books are required
6) Make-up exams are permitted ONLY for serious and compelling reasons.

Quizzes (PLO 1)
1) Given at beginning of every lecture.
2) CLOSED book, notes, and neighbor.
3) Make-up quizzes WILL NOT be given under any circumstances.

Laboratory Work (SLO 7; SLO 8; SLO 9; SLO 10; SLO 11; SLO 12; SLO 13)
1) Students are expected to attend and participate regularly in laboratories
2) Lab assignments must be turned in by the due date assigned for each
3) Late lab assignments will not be accepted and will receive zero points
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Exercise Physiology Instrumentation

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Weighting</th>
<th>Student Learning Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competency Tests (2% each)</td>
<td>12%</td>
<td>1,2</td>
</tr>
<tr>
<td>Professionalism, Care of Equipment</td>
<td>4%</td>
<td>1</td>
</tr>
<tr>
<td>Anthropometric Lab</td>
<td>5%</td>
<td>1,3</td>
</tr>
<tr>
<td>BIA Lab</td>
<td>5%</td>
<td>1,3</td>
</tr>
<tr>
<td>Skinfold Lab</td>
<td>5%</td>
<td>1,3</td>
</tr>
<tr>
<td>Hydrostatic Weighing Lab</td>
<td>5%</td>
<td>1,3</td>
</tr>
<tr>
<td>Bod Pod Lab</td>
<td>5%</td>
<td>1,3</td>
</tr>
<tr>
<td>Spirometry Lab</td>
<td>5%</td>
<td>1,3</td>
</tr>
<tr>
<td>Trifit &amp; Cholestech Lab</td>
<td>5%</td>
<td>1,3</td>
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<tr>
<td>Body Composition Project</td>
<td>12%</td>
<td>1,3,5,6</td>
</tr>
<tr>
<td>Quizzes (6 of 7 counted)</td>
<td>16%</td>
<td>3,4,6</td>
</tr>
<tr>
<td>Lab Practical - Spirometry</td>
<td>5%</td>
<td>1,2,6</td>
</tr>
<tr>
<td>Written Final Exam</td>
<td>16%</td>
<td>3,4,5,6</td>
</tr>
</tbody>
</table>

Competency Tests

Students will demonstrate competency on the following:

- Measuring height
- Measuring weight
- Measuring circumferences
- Measuring diameters
- Measuring skinfolds
- Performing hydrostatic weighing

Grading on competency tests:

A (95%) = excellent technique (performed smoothly & with confidence, accurate results)
B (85%) = good technique (minor corrections needed)
F (50%) = poor or weak technique (significant errors, questionable data)
0 pts = did not attempt competency

Students receiving less than an A grade will receive feedback and may, after further practice, retake the competency on another day. If a student does not attempt a competency by the first deadline date, the score may be lowered one letter grade for each week, or part of a week, that the deadline is missed. Students are responsible for scheduling their own competency tests. These may be scheduled during labs
or other nonclass times (if the instructor cannot test everyone during the scheduled lab period). If the test is not taken during a laboratory period, students must bring a client when one is needed. The last day to complete competencies is during the practical examination (if time allows, maximum of 1 competency tested.)

**Labs and Body Composition Project**

Guidelines and forms are in the course reader. Refer to the class schedule for due dates. Written work must be typed or neatly hand-written. Remember to proofread and check for completeness before turning in.

<table>
<thead>
<tr>
<th>Due Date</th>
<th>Received</th>
<th>Grade Lowered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>After class Mon. through Wed.</td>
<td>1 grade step (eg, B+ → B)</td>
</tr>
<tr>
<td></td>
<td>Thurs. or Fri.</td>
<td>2 grade steps (eg, B+ → B-)</td>
</tr>
<tr>
<td></td>
<td>Sat. through following Mon.</td>
<td>1 full grade (eg, B+ → C+)</td>
</tr>
<tr>
<td>Wednesday</td>
<td>After class Wed. through Fri.</td>
<td>1 grade step</td>
</tr>
<tr>
<td></td>
<td>Sat. through Mon.</td>
<td>2 grade steps</td>
</tr>
<tr>
<td></td>
<td>Tues. or following Wed.</td>
<td>1 full grade</td>
</tr>
</tbody>
</table>

Students must speak with the instructor regarding assignments that are over 1 week late.

**Laboratory Practical - Spirometry**

! Students will demonstrate skill in obtaining pulmonary measurements using the Collins spirometer.
! A 15 minute test session will be scheduled; all measurements must be completed in this time period.
! After a student is tested, he/she will serve as the client for the next individual. If there is no test immediately before, the student being tested must bring a client. The client may NOT be a class member unless he/she has been tested.
! Grades will be based on ability to: (a) give accurate and complete instructions to participant, (b) administer test correctly and obtain accurate data. **Calculations are not required during the laboratory practical.**
! During the practical exam, students who realize they have made an error should correct the error. (It's better to correct an error than to hope/think it will be undetected. Proficiency in testing includes recognizing your errors.)
! Grading: 90-100% = No errors or very minor errors, technique & data are good
  80-89% = Some errors, needs additional practice
  60-79% = Significant errors, needs correction and practice
  <60% = Very poor technique or unable to obtain measurements without help; data are invalid

**Converting Letter Grades to Percentages**

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>98%</td>
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<tr>
<td>A</td>
<td>95%</td>
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<tr>
<td>A-</td>
<td>91%</td>
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<tr>
<td>B+</td>
<td>88%</td>
</tr>
<tr>
<td>B</td>
<td>85%</td>
</tr>
<tr>
<td>B-</td>
<td>81%</td>
</tr>
<tr>
<td>C+</td>
<td>78%</td>
</tr>
<tr>
<td>C</td>
<td>75%</td>
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<tr>
<td>C-</td>
<td>71%</td>
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<tr>
<td>D+</td>
<td>68%</td>
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<td>D</td>
<td>65%</td>
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<tr>
<td>D-</td>
<td>61%</td>
</tr>
<tr>
<td>F</td>
<td>≤ 50%</td>
</tr>
</tbody>
</table>
Quizzes & Written Final Exam

In-class quizzes (Quizzes 1-5) and the final exam will cover theoretical background, use of equipment, data collection and interpretation.

Questions may include true-false, multiple choice, short answer, problems, and calculations.

- Pre-lab questions (completed online – Canvas) MUST be completed before 8:00 am on the lab day. There is NO make-up or second chance to complete the pre-lab questions, so plan accordingly! If you start early enough, you will have options if there are technological problems (e.g., on-campus computers if your computer breaks or you have internet connection problems). If you wait until the last minute and there are technological problems, accept the consequences without complaint. The total points on the pre-lab questions will be equivalent to two quiz scores.
  Quiz 6 = pre-lab questions on skinfolds, hydrostatic weighing, and ADP. Quiz 7 = pre-lab questions on environmental conditions/pulmonary and health/fitness assessments. Pre-lab questions are to be completed independently, NOT in a group. Carefully read the information on the University’s Academic Integrity Policy; violations will be reported with appropriate sanctions taken. Earning your college degree is important – think carefully before jeopardizing this process!

Six of seven quiz scores will be counted; the lowest quiz score will be dropped.

Make-ups for in-class quizzes and exams are permitted only for illness and emergency (TRULY EXTRAORDINARY CIRCUMSTANCES). The student is responsible for notifying the instructor and making arrangements at the earliest possible time. In most cases, the quiz/exam must be completed before the next class meeting. All requests for make-up exams will be evaluated on an individual basis. Again, there is NO MAKE-UP for missed pre-lab questions.
## Example

<table>
<thead>
<tr>
<th>Component</th>
<th>% Earned</th>
<th>X</th>
<th>Points Possible</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>85%, 95%, 95%, 95%, 95%, 95%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Avg = 93.3%</td>
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<td></td>
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<tr>
<td>Professionalism</td>
<td>90%</td>
<td>X</td>
<td>4</td>
<td>3.6</td>
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<tr>
<td>Anthropometric Lab</td>
<td>83%</td>
<td>X</td>
<td>5</td>
<td>4.15</td>
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<tr>
<td>BIA Lab</td>
<td>94%</td>
<td>X</td>
<td>5</td>
<td>4.7</td>
</tr>
<tr>
<td>Skinfold Lab</td>
<td>80%</td>
<td>X</td>
<td>5</td>
<td>4.0</td>
</tr>
<tr>
<td>Hydrostatic Lab</td>
<td>85%</td>
<td>X</td>
<td>5</td>
<td>4.25</td>
</tr>
<tr>
<td>Bod Pod Lab</td>
<td>95%</td>
<td>X</td>
<td>5</td>
<td>4.75</td>
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<tr>
<td>Pulmonary Lab</td>
<td>72%</td>
<td>X</td>
<td>5</td>
<td>3.6</td>
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<tr>
<td>Trifit Lab</td>
<td>100%</td>
<td>X</td>
<td>5</td>
<td>5.0</td>
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<tr>
<td>Body Comp. Project</td>
<td>91%</td>
<td>X</td>
<td>12</td>
<td>10.92</td>
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<tr>
<td>Quizzes</td>
<td>Avg = 82%</td>
<td>X</td>
<td>16</td>
<td>13.12</td>
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<td>Lab Practical - Spirometry</td>
<td>80%</td>
<td>X</td>
<td>5</td>
<td>4.0</td>
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<tr>
<td>Written Final Exam</td>
<td>85%</td>
<td>X</td>
<td>16</td>
<td>13.6</td>
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<tr>
<td>Total for exercise physiology half of course</td>
<td>86.89 out of 100 pts converted to 43.445 out of 50 pts for exercise physiology half of course</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>50 pts possible in exercise physiology half; 50 pts possible in biomechanics half of course</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
**PROPOSED SCHEDULE**

(Subject to change with fair notice – any changes will be announced in class)

**BIOMECHANICS**

<table>
<thead>
<tr>
<th>Dates</th>
<th>Topic</th>
<th>Chapters/Handouts</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-25, 8-27 &amp; 9-3</td>
<td>Baseline Data Collection and Analysis</td>
<td>Chapter 1, Chapter 1 Handout, Lecture Handout 1 Lab 1</td>
</tr>
<tr>
<td></td>
<td>Review of Biomechanics Conceptual Knowledge</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Data Collection and Analysis Concepts</td>
<td></td>
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<tr>
<td></td>
<td>o 3D Acceleration</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Data Collection and Analysis Activities</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o 3D Acceleration</td>
<td></td>
</tr>
<tr>
<td>9-8 &amp; 9-10</td>
<td>Biomechanical Model for Minimizing Sum of Joint Forces when Landing after a Vertical/Horizontal Jump</td>
<td>Chapter 3, Chapter 3 Handout, Lecture Handout 2 Lab 2</td>
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<td>9-15 &amp; 9-17</td>
<td>Biomechanical Model for Maximizing Jump Height/Distance</td>
<td>Chapter 2, Chapter 2 Handout Lab 3</td>
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<td>9-22 &amp; 9-24</td>
<td>Biomechanical Model for Minimizing Joint Loads During Horizontal Locomotion (Walking and Running)</td>
<td>Chapter 4, Chapter 4 Handout Locomotion Handout Lab 4</td>
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<td>9-29 &amp; 10-1</td>
<td>Biomechanical Model for Minimizing Movement Time during Horizontal Locomotion (Walking and Running)</td>
<td>Chapter 4, Chapter 4 Handout Locomotion Handout Lab 5</td>
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<td>Activity Description</td>
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| 10-6 & 10-8 | Pre/Post Data Comparison  
  • Data Collection and Analysis Activities  
    a) 2D Video  
    b) 3D Acceleration                  | Lab 6 |
| 10-13 & 10-15 | Lab Practical Exam                                                                  |     |
| 10-20      | Biomechanical Concepts and Biomechanical Modeling Exams                              |     |
**EXERCISE PHYSIOLOGY**

*Readings from Heyward & Wagner text. In addition to the text assignments, students should read the appropriate sections of the exercise physiology course reader BEFORE class.*

CT: Date for completion of first attempt at competency test

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<th>*TEXT ASSIGNMENT</th>
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<tr>
<td>Wed., Oct. 22</td>
<td>Body Composition Assessment Lab: Anthropometric Measurements (Height, Weight, Circumferences, Diameters)</td>
<td>Chaps. 1, 5</td>
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<td>Mon., Oct. 27</td>
<td>Lec: Anthropometric Measurements &amp; BIA Lab: Height, Weight, Circumferences, Diameters, BIA</td>
<td>Chaps. 6, 10</td>
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<td>Lab: Height, Weight, Circs, Diameters, BIA</td>
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<td>Mon., Nov. 3</td>
<td>Lec: Skinfold Measurements Lab: Circs, Diameters, BIA, Skinfolds</td>
<td>Chaps. 2, 4</td>
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<td><strong>QUIZ 1 (Anthropometric Measurements &amp; BIA)</strong></td>
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<td>Lab: Skinfolds</td>
<td>Anthropometric &amp; BIA Labs</td>
<td>CT: Circ &amp; Diam</td>
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<td>Mon., Nov. 10</td>
<td>Lec: Hydrostatic Weighing Lab: Skinfolds &amp; Hydrostatic Weighing</td>
<td>pp. 27-33, 37-40 Chap. 15</td>
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<td>Mon., Nov. 17</td>
<td>Lec: Air Displacement Plethysmography (ADP or Bod Pod) &amp; DXA Lab: Hydrostatic Weighing &amp; Bod Pod</td>
<td>pp. 33-37, 40-47 Chap. 11</td>
<td>Pre-lab on ADP &amp; DXA</td>
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<td>Wed., Nov. 19</td>
<td>Lab: Bod Pod &amp; DXA Demonstration</td>
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<td>Mon., Dec. 1</td>
<td>Lec: Health &amp; Fitness Assessments</td>
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<td>Pre-lab on Health &amp; Fitness Assmts.</td>
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<td>Mon., Dec. 8</td>
<td>Lec: Body Comp Data, Catch Up &amp; Review</td>
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<td>Wed., Dec. 10</td>
<td>Lab: <strong>Lab Practicals</strong></td>
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<td>Thurs., Dec. 18</td>
<td><strong>Final Exam (written)</strong></td>
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