BROCK UNIVERSITY
DEPARTMENT OF PHYSICAL EDUCATION AND KINESIOLOGY
BIOMECHANICS II

PHED 4P10 Course Outline Fall (D2) 2006

Instructor: David A. Gabriel, Ph.D.
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Office Hours: Wednesdays 14:00-16:30
Lectures: M-W-F 13:00-14:00 AS202
Laboratories: As assigned biweekly in WH144
Prerequisites: PEKN 3P10
Required Materials: Calculator with trigonometric functions

COURSE OF PHILOSOPHY

This course concentrates on the mechanical analysis of human movement. Theoretical insight into the body as a physical system is provided through INTENSIVE computational investigation. Students will then be exposed to laboratory techniques and instrumentation necessary for measuring human movement.

EVALUATION

Signed student data sheet (due Friday, September 15th no exceptions)……………………………… +2%
Laboratory quiz……………………………………………………………………………………………………………………… +4%
Practice midterm (in class Monday, October 16th)………………………………………………………………………… 0%
Midterm examination I (in class Monday, October 23rd)………………………………………………………………… 20%
Last day of withdrawal without academic penalty is November 3rd
Laboratory examination (in class Monday, November 17th)………………………………………………………… 20%
Laboratory examination II (in class Monday, November 20th)………………………………………………………… 20%
Final examination (cumulative: lectures plus laboratories)……………………………………………………………… 40%
TOTAL 100%

SUGGESTED TEXTBOOK

This is an excellent reference that help with the course. The contact information is availbale for the following book is: http://www.health.uottawa.ca/biomech/watbiom.

LECTURES

The class lectures will be based on the following schedule outlined immediately below. The course is structured in the following way. First, you are required to attend class and are responsible for any material presented in class OR announcements made in class whether you are in attendance or not. You are strongly advised to take notes during lectures and actively engage in trying to "figure things out" with me. My lecture notes will appear on WebCT upon completion of each topic. Use my lecture notes only as part of a review after each topic. That is, fill in material that you may have missed and correct any mistakes that either of us have made (I am far from perfect) during the lecture.

LECTURE SCHEDULE

1. Syllabus and academic expectations, Introduction and Newton's Laws
2. The concept for force vectors, trigonometry, and coordinate systems
3. The rectangular components of force
4. Moments of force (torque)
5. Moments of force and 2D static equilibrium
6. The concept of motion
7. Linear kinematics and a review of differential and integral calculus
8. Angular kinematics and analogs of Newton’s laws
9. Dynamics
10. Introduction to link-segment modeling (Inverse Dynamics)

SUGGESTIONS

A minimum of three hours of study time is required for each hour of class. Review the lecture notes after class and rework the problems changing different variables. Form a study group. Ask questions when you don’t understand something. Read laboratories ahead in preparation for the lecture and laboratory. **Don’t wait until the after the midterm to come to grips with these requirements.**
LABORATORIES

Laboratory sections will meet once every two weeks for three hours, and follow the schedule below. Laboratory attendance is required. The laboratory will appear on WebCT prior to the date of the expected laboratory. You are required to read the laboratory prior to participation. At the beginning of each laboratory session, there will be a very short quiz. The quiz will be on the reading material and cover both the theory and methodology involved in the laboratory. A perfect score on the quiz will result in 1 bonus point to your final mark. Since there are four laboratories, there is a potential of 4 bonus points. There is no makeup for a quiz if you are late and miss it.

There is no formal laboratory write-up for submission, but you are responsible to know all of the laboratory material for the test. The laboratory test will be both computational and short answer-essay. Laboratory attendance is important for two reasons. First, you will need to complete the laboratory manual to successfully understand the material. Second, after completion of the laboratory exercise, it is a "golden" opportunity to receive help on class material from the TA’s.

LABORATORY SCHEDULE

| Laboratory 1: Moment arm and exercise devices | Tuesday, September 19 | Lab Sections 1 & 7 |
|                                             | Thursday, September 21 | Lab Sections 3 & 5 |
|                                             | Tuesday, September 26  | Lab Sections 2 |
|                                             | Thursday, September 28  | Lab Sections 4 & 6 |
| Laboratory 2: Center of gravity              | Tuesday, October 3     | Lab Sections 1 & 7 |
|                                             | Thursday, October 5    | Lab Sections 3 & 5 |
|                                             | Tuesday, October 10    | Lab Sections 2 |
|                                             | Thursday, October 13   | Lab Sections 4 & 6 |
| Laboratory 3: Kinematic analysis of motion   | Tuesday, October 17    | Lab Sections 1 & 7 |
|                                             | Thursday, October 19   | Lab Sections 3 & 5 |
|                                             | Tuesday, October 24    | Lab Sections 2 |
|                                             | Thursday, October 26   | Lab Sections 4 & 6 |
| Laboratory 4: Kinetic analysis of motion     | Tuesday, October 31    | Lab Sections 1 & 7 |
|                                             | Thursday, November 2   | Lab Sections 3 & 5 |
|                                             | Tuesday, November 7    | Lab Sections 2 |
|                                             | Thursday, November 9   | Lab Sections 4 & 6 |

FINAL EXAMINATION

There will be a final exam (3 hours) held during regular exam period. Anyone not able to attend a final exam during this time should not be registered in this course. The departmental make-up exam day is Wednesday, January 3rd, 2007 (9:00-12:00 in WC240).
Student Data Sheet

Name:

e-mail:

Professional goals: where will you be, and what will you be doing in 5 years?

ACADEMIC MISCONDUCT

The instructor of this course will adhere to the definitions of academic misconduct outlined in Section VII of the 2005/2006 Brock Calendar, page 30-31. Read Section VII of the Brock 2005/2006 calendar on academic regulations and university policies on academic misconduct then sign below. The same information is given through the Brock web-page at the following address http://www.brocku.ca/webcal/2005/undergrad/acad.html#sec66

I have read Section VII of the Brock 2005/2006 calendar on academic regulations and university policies regarding academic misconduct.

________________________________________
Signature

_______________________________
date