Biomechanics

Kinesiology 201

Section: D100

Term: 2007 Summer

Instructor: TBA

Office: TBA

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Discussion Topics: Course Structure

One two-hour and one-hour lecture, and one one-hour tutorial per week.

Course Description

This course will cover the application of basic mechanics to human movement. It will provide students with the basic understanding of how forces act on body segments and how movements are produced. The subject matter in this course is relevant to quantifying all forms of physical activity: activities of daily living; physically challenged movement patterns; elite athletic performance; work related tasks, etc. It also has applications in medical settings, including rehabilitation and sports medicine.

Lecture Topics

Introduction to problem solving; free body diagrams; basic biomechanical terminology; forces & torques; translation and rotation; vectors; biomechanics of the skeletal system; linked segment models of the human body; basic muscle mechanics; levers; muscle moment arm; force-length and force-velocity relationships; biomechanics of articulations, linear kinematic quantities, equations of uniform motion; projectiles; angular kinematics; Newton's Laws of motion; forces, linear impulse; work power & energy; static & dynamic equilibrium; joint forces and torques under static conditions; centre of mass; distributed forces, centre of pressure; moment of inertia; angular momentum; angular impulse; linked segment dynamics; joint forces and torques under dynamic conditions; fluid mechanics.

Grading: Assignments - 10% (2 x 5%)

Midterms - 40% (2 x 20%)

Presentation - 10%

Final exam - 40%

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Required Texts: Hamill, J. & K.M. Knutzen. Biomechanical Basis of Human Movement (2nd Edition). Williams and Wilkins, Philadelphia, 2003. Copies of the PowerPoint slides used in lecture and a large number of sample problems with solutions have been developed for this

Recommended Texts:

Materials/Supplies:

Prerequisite/Corequisite: Prerequisites:

MATH 151 (or 154); MATH 152 (or 155) (may be taken concurrently); PHYS 101 (or 120 or 125 or 140); KIN 142.

Note:

Students with credit for KIN 401 may not take KIN 201 for further credit.

Notes: Failure to attend an examination

Students who miss examinations due to exceptional circumstances (such as serious illness or compassionate reasons) are required to obtain a physician's certificate, whereby the physician states that you were unable to write your midterm or final on the set date due to a medical condition beyond your control, or other supporting documents in order to obtain consideration in the course. Such documents must be filed with the School Director (via the Kinesiology office) or Registrar within four calendar days of the date on which the examination was to have been written. Exceptional circumstances must be approved by the Undergraduate Program Committee in order for a student to receive consideration.

Students must check the exam schedule when making course selections. Students are reminded that final examinations may be scheduled at any time during the examination period and that students should avoid making travel or employment arrangements for this period.

Academic honesty and student conduct

Academic honesty is a condition of continued membership in the University community.

Academic dishonesty, including plagiarism or any other form of cheating is subject to serious academic penalty, i.e. failure on an assignment, failure in a course, suspension or expulsion from the University.

The University codes of student conduct and academic honesty are contained in policies T10.01 and T10.02 which are available in the Course Timetable and on the Web via http://www.reg.sfu.ca.

July 2000

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This outline is derived from a course outline repository database that was maintained by SFU Student Services and the University’s IT Services Department. The database was retired in 2014 and the data migrated to SFU Archives in 2015.