## Course Name:
**KNPE 353/3.0**
Biomechanics

## Course Instructors:
Dr. Patrick Costigan

## Contact Hours:
- Lectures: 2 x 1.5 hrs/wk x 12 weeks
- Labs: 1 x 2 hrs/every other wk x 12 weeks

## Prerequisite:
- (A grade of B- in 6.0 units at the 100 level in MATH or PHYS) or KNPE 153/3.0
- (Level 2 or above in a KINE or PHED plan) or (Level 3 or above in all other plans)

## Exclusion:
- PHED 353/3.0, KINE 353/3.0

## Course Description:
Through laboratory sessions students evaluate human performance using standard equipment and applying typical biomechanical methods to process and analyze the performance data. A final project allows the student to apply these skills to their own project.

## Course Texts:
Software: Matlab Student Version (required).

Any notes will be available on Moodle.

## Course Objectives:
- Provide students with the theoretical background for biomechanical concepts such as: kinematics, kinetics, muscle mechanics, and electromyography.
- Familiarize students with the equipment used to collect biomechanical data.
- Familiarize students with typical methods used to process human performance data.
- Give students the Matlab® skills to process and analyze biomechanical data.
- Have students carry out a small biomechanics group research study.

## Course Evaluation:
- Lab Assignments (6) 30%
- One page proposal required
- Review of literature 10%
- Full proposal 5%
- Oral presentation 15%
- Written submission 20%
- Final exam – take home 20%

## Course Outline

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<th>Ethics</th>
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<td>Digitizing, impulse</td>
<td>Energy</td>
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<td>Stability</td>
<td>Kinetics</td>
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<td>Linear Kinematics</td>
<td>Lifting</td>
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<td>Errors and Filters</td>
<td>Body Segment parameters</td>
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<td>Angular Kinematics</td>
<td>Musculoskeletal Injuries</td>
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<td>Vertical Jump (Vicon &amp; Force plate)</td>
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