

DEPARTMENT OF KINESIOLOGY AND HEALTH SCIENCES

COURSE OUTLINE – Winter 2025

PE2060 (A3): Biomechanics – 3 (3-0-1) UT 60 Hours for 15 Weeks

Northwestern Polytechnic acknowledges that our campuses are located on Treaty 8 territory, the ancestral and present-day home to many diverse First Nations, Metis, and Inuit people. We are grateful to work, live and learn on the traditional territory of Duncan's First Nation, Horse Lake First Nation and Sturgeon Lake Cree Nation, who are the original caretakers of this land.

We acknowledge the history of this land and we are thankful for the opportunity to walk together in friendship, where we will encourage and promote positive change for present and future generations.

INSTRUCTOR: Dr. Brye McMorran **PHONE:** 780-539-2971
OFFICE: K215 **E-MAIL:** bmcmorran@nwptech.ca
OFFICE HOURS: By appointment

CALENDAR DESCRIPTION: The course presents a method of quantitative and qualitative analysis of human movement based on a knowledge of biomechanical principles.

PREREQUISITE(S)/COREQUISITE: PE1000

REQUIRED TEXT/RESOURCE MATERIALS:

McGinnis, P. (2021). Biomechanics of Sport and Exercise Fourth Edition. Human Kinetics. ISBN: 9781492571407.

Scientific Calculator

DELIVERY MODE(S): This course will be delivered through a variety of lecture-based strategies including discussions, group work, in-class activities, labs, and individual student work.

LEARNING OUTCOMES: By the end of the course, students will be able to:

- Explain the importance of biomechanics in the analysis of sport and exercise.

- Describe Newton's laws of motion and how they apply to exercise and sport.
- Differentiate between kinetic and kinematic quantities for both linear and angular motion.
- Describe the effects of fluid mechanics, water and air, on motion.
- Implement the procedures of a qualitative Biomechanical Analysis to improve performance, reduce injury, and improve training.

TRANSFERABILITY:

Please consult the Alberta Transfer Guide for more information. You may check to ensure the transferability of this course at the Alberta Transfer Guide main page <http://www.transferalberta.alberta.ca>.

** Grade of D or D+ may not be acceptable for transfer to other post-secondary institutions. **Students are cautioned that it is their responsibility to contact the receiving institutions to ensure transferability.**

EVALUATIONS:

Assessment	%	Due Date
Seminar Quizzes	25	Throughout the semester
Midterm	25	12-Feb
Exam	25	TBD
Assignment 1	10	14-Feb
Assignment 2	10	28-Mar
Participation	5	Throughout the semester

GRADING CRITERIA:

Please note that most universities will not accept your course for transfer credit **IF** your grade is **less than C-**.

Alpha Grade	4-point Equivalent	Percentage Guidelines	Alpha Grade	4-point Equivalent	Percentage Guidelines
A+	4.0	95-100	C+	2.3	67-69
A	4.0	85-94	C	2.0	63-66
A-	3.7	80-84	C-	1.7	60-62
B+	3.3	77-79	D+	1.3	55-59
B	3.0	73-76	D	1.0	50-54

B-	2.7	70-72	F	0.0	00-49
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COURSE SCHEDULE/TENTATIVE TIMELINE:

Lectures

Monday/Wednesday 4:00 - 5:20 pm

Labs

L1 – Mondays 11:30 am - 12:20 pm

L2 – Tuesdays 11:30 am - 12:20 pm

The instructor reserves the right to alter the date, pace, scope, and/or breadth of the topics covered to facilitate student learning and to cohere with the natural flow of class discussions.

Lecture Schedule:

Week	Lecture	Topic
1	Jan 6-8	Introduction/Forces
2	Jan 13-15	Forces
3	Jan 20-22	Linear Kinematics
4	Jan 27-29	Linear Kinematics/Kinetics
5	Feb 3-5	Linear Kinetics
6	Feb 10-12	Review/Midterm
7	Feb 17-19	BREAK
8	Feb 24-26	Work, Power, Energy
9	Mar 3-5	Moment
10	Mar 10-12	Moment
11	Mar 17-19	Angular Kinematics
12	Mar 24-26	Angular Kinematics/Kinetics
13	Mar 31-Apr 2	Angular Kinetics
14	Apr 7-9	Fluid Mechanics/Review
15	Apr 14-23	EXAM PERIOD

Seminar Schedule:



Week	Seminar	Topic
1	Jan 6-7	Introduction
2	Jan 13-14	Forces
3	Jan 20-21	Review/Quiz - Forces
4	Jan 27-28	Linear Kinematics
5	Feb 3-4	Review/Quiz - Linear Kinematics
6	Feb 10-11	Linear Kinetics
7	Feb 17-18	BREAK
8	Feb 24-25	Survey/ Work, Power, Energy
9	Mar 3-4	Review/Quiz - W, P, E
10	Mar 10-11	Moment
11	Mar 17-18	Review/Quiz - Moment
12	Mar 24-25	Angular Kinematics
13	Mar 31-Apr 1	Angular Kinetics
14	Apr 7-8	Review/Quiz - Angular Kinematics/Kinetics
15	Apr 14-23	EXAM PERIOD

STUDENT RESPONSIBILITIES:

Students are expected to come to class prepared and regular attendance is critical to succeed in this class. Students should contact the instructor in advance if they are unable to attend. It is the student's responsibility to acquire any materials and content missed due to absence.

Lectures/Slides will be provided to students in a format of the instructors choosing. You may not always receive complete slides or there may be alterations to the ones posted. It is the student's job to ensure they are taking appropriate notes. Refer to Northwestern Polytechnic policy on the Student Rights and Responsibilities on the NWP website.

All assignments are expected to be submitted on the due date. Late assignments will be deducted 10% per day up to 5 days late. After 5 days late, assignments will not be accepted and receive a grade of 0. Each day will consist of the 24-hour period following the due date, including weekdays and weekends. Valid reasons for submission of late assignments as well as absence from labs, tests, midterm exam need to be communicated to the instructor as soon as possible and are limited to:

- Medical emergencies (physician note may be required)
- Death in the immediate family (death certificate may be required)
- Other significant occurrences (some form of documentation may be required)

STATEMENT ON ACADEMIC MISCONDUCT:

Academic Misconduct will not be tolerated. For a more precise definition of academic misconduct and its consequences, refer to the Student Rights and Responsibilities policy available at <https://www.nwpolytech.ca/about/administration/policies/index.html>.

*Note: all Academic and Administrative policies are available on the same page.