

DEPARTMENT OF KINESIOLOGY AND HEALTH SCIENCES

COURSE OUTLINE – Fall 2026

PE2060 (A2/L1): Biomechanics – 3 (3-0-2) 75 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@nwpolytech.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): PE1000

COREQUISITE(S): None

REQUIRED MATERIALS:

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

Scientific Calculator

DELIVERY MODE(S): This course is delivered through in-person lectures and laboratory sessions, using a variety of instructional strategies, including discussions, demonstrations, experiential learning activities, collaborative group work, independent learning activities, and practical application exercises.

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
Lab Quizzes	25	5 quizzes at 5% each scheduled throughout the semester during lab (see lab schedule)
Midterm	25	October 15 - In-lecture
Final Exam	30	Exam Period (TBD)
Assignment 1	10	October 23 - 11:59pm
Assignment 2	10	November 6 - at the beginning of lab (8:00am)

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

COURSE SCHEDULE/TENTATIVE TIMELINE:

Lectures (J202): Tues/Thurs 1:00-2:20pm

Labs (L123): Friday 8:00-9:50am

Week	Date	Lecture Topic (Tuesday)	Lecture Topic (Thursday)	Lab Topic (Friday)
1	Sep. 2-4	No Classes Schedule	Course Introduction	No Lab
2	Sep. 7-11	Introduction to Biomechanics	Forces	Lab 1: Introduction to Biomechanics
3	Sep. 14-18	Forces	Forces	Lab 2: Forces
4	Sep 21-25	Linear Kinematics	Linear Kinematics	Quiz 1 - Forces Lab 3: Project Groups, Linear Kinematics
5	Sep. 28-Oct. 2	Linear Kinetics	Linear Kinetics	Lab 4: Linear Kinetics
6	Oct. 5-9	Work, Power, Energy	Work, Power, Energy	Quiz 2 - Linear Kinematics and Kinetics Lab 5: Work, Power, Energy
7	Oct. 12-16	Review	Midterm	Lab 6: Assignment 1
8	Oct. 19-23	Angular Kinematics	Angular Kinematics	Lab 7: Angular Kinematics Assignment 1 Due Quiz 3: Survey
9	Oct. 26-30	Angular Kinematics	Angular Kinetics	Lab 8: Angular Kinematics Work
10	Nov. 2-6	Angular Kinetics	Angular Kinetics	Lab 9: Angular Kinetics Assignment 2 Due
11	Nov. 9-13	FALL BREAK		
12	Nov. 16-20	Moment	Moment	Quiz 4 - Angular Kinematics and Kinetics Lab 10: Moment
13	Nov. 23-27	Moment	Moment	Lab 11: Moment & Angular Human Movement Analysis
14	Nov. 30-Dec. 4	Fluid Mechanics	Fluid Mechanics	Quiz 5 - Moment Lab: 12: Fluid Mechanics
15	Dec. 7-11	Review	EXAM PERIOD BEGINS	

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.

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.

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 <https://www.nwpolytech.ca/about/polytechnic-leadership/policies-directory>.

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

Additional Information:

POLICY ON INSTRUCTIONAL RESOURCES AND MATERIALS: Any course resource/material should be properly used: the content created by your instructor is their intellectual property and is provided to you based upon your registration for this class; as such, the material is for your private use only. It is not to be distributed, publicly exhibited, or sold without the permission of the instructor. Third party materials (such as assigned readings, videos, etc.) have either been licensed for use in this course or fall under an exception or limitation in Canadian Copyright law.

POLICY ON LATE/MISSED ASSESSMENTS: 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 the submission of late assignments as well as absence from labs or assessments must be communicated to the instructor, with supporting documentation, within 7 days of the missed item. Acceptable reasons 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)



Requests submitted after 7 days, or without appropriate supporting documentation, may not be considered.

POLICY ON INFORMED CONSENT FOR PARTICIPATION IN PHYSICAL ACTIVITY: This course includes physical activity, exercise, and/or fitness assessments as part of its learning and evaluation components. By enrolling in this course, you acknowledge and accept the following:

- You may be asked to participate in physical activity sessions, which include aerobics and/or musculoskeletal training.
- While the risk is minimal, physical activity may involve potential adverse effects such as episodes of transient light-headedness, loss of consciousness, abnormal heart rate and/or blood pressure, chest discomfort, leg cramps, nausea). You voluntarily assume these risks.
- You are responsible for promptly informing your instructor(s) of any pain, discomfort, fatigue, or other symptoms experienced during or within 48 hours of the course session.
- You must disclose any health conditions that could be affected by physical activity. The instructor(s) will make reasonable modifications, where appropriate, and may request documentation from a qualified health professional.

POLICY ON THE USE OF ARTIFICIAL INTELLIGENCE (AI): The use of Artificial Intelligence (AI), including Large Language Models (LLMs) and other related technologies, has grown significantly in recent years and is now part of everyday reality. The intent of this policy is not to prohibit their use entirely, but to ensure it is applied appropriately and transparently in accordance with established course guidelines. This policy applies only to this course; other instructors may have different policies, and students should not assume these rules apply elsewhere. When no specific rules are established for a given task, the following defaults will apply: **i. For Assignments, Reports, and Presentations** – AI tools may be used to assist in brainstorming but may not be used to generate the complete work; if AI is used, references are required, students must read and verify them to ensure accuracy and existence; any information generated by AI must be independently verified using credible sources; and students must fully understand the material they submit. The instructor may interview students to assess their understanding, and a demonstrated lack of knowledge will be treated as probable academic misconduct. **ii. For Tests, Exams, and Quizzes** – the use of AI tools, search engines, communication devices, or any feature enabling communication with external entities is strictly prohibited. Once specific rules are set for a task, those rules override these defaults, which will no longer apply. Any breach of the applicable rules will be addressed under the institution's academic misconduct procedures.