

# HUMAN KINETICS (HK)

## **HK\*2270 Principles of Human Biomechanics Fall Only (LEC: 3, LAB: 1) [0.50]**

This course will address the application of mechanical principles to the study of human movement. Topics will include: motion analysis techniques, anthropometrics, biological tissue tolerance, muscle force generation, static and dynamic equilibrium, work/energy and impulse/momentum as they apply to the description of motion, injury of musculoskeletal tissues and optimization of human performance.

**Prerequisite(s):** 4.00 credits including BIOL\*1090, PHYS\*1080

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

## **HK\*2810 Human Physiology I - Concepts and Principles Winter Only (LEC: 3) [0.50]**

This course will introduce the fundamental concepts and principles of communication systems (transport, ion movement, nerve and synapse, muscle) in humans. It will focus on primary physiological communication systems, such as the endocrine and central nervous systems, and integrate basic principles to understand larger systems such as the gastrointestinal tract.

**Prerequisite(s):** BIOC\*2580, BIOL\*1080

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

## **HK\*3100 Neuromuscular Physiology Winter Only (LEC: 3) [0.50]**

Normal muscle movement is controlled by the motor cortex or by reflexes within the context of the sensory environment. This course will introduce key concepts in motor control of mammalian, human movement, coordination of movement, motor program selection, motor program execution, motor unit recruitment, skeletal muscle excitation-contraction coupling. This course is required for students wishing to gain certification by the Ontario Kinesiology Association.

**Prerequisite(s):** 1 of BIOM\*3200, HK\*3810, ZOO\*3600

**Restriction(s):** Restricted to BSCH.HK and NEUR majors/minors.

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

## **HK\*3401 Human Anatomy: Dissection Fall Only (LEC: 3, LAB: 3) [0.75]**

First part of the two-semester course HK\*3401/2. A two-semester lecture and laboratory course in human anatomy which includes a detailed study of the skeleton, upper and lower limbs, thorax, abdomen, pelvis, perineum, head, neck and central nervous system. The labs involve hands-on dissection. This is a two-semester course offered over consecutive semesters. When you select it you must select HK\*3401 in the Fall semester and HK\*3402 in the Winter semester. A grade will not be assigned to HK\*3401 until HK\*3402 has been completed.

**Co-requisite(s):** BIOM\*3200 or HK\*3810

**Restriction(s):** HK\*3401, HK\*3402 Registration in the BSC. Major in Human Kinetics or Bio-Medical Science. Instructor consent required.

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

## **HK\*3402 Human Anatomy: Dissection Winter Only (LEC: 3, LAB: 3) [0.75]**

Second part of the two-semester course HK\*3401/2. A two-semester lecture and laboratory course in human anatomy which includes a detailed study of the skeleton, upper and lower limbs, thorax, abdomen, pelvis, perineum, head, neck and central nervous system. The labs involve hands-on dissection. This is a two-semester course offered over consecutive semesters. When you select it you must select HK\*3401 in the Fall semester and HK\*3402 in the Winter semester. A grade will not be assigned to HK\*3401 until HK\*3402 has been completed.

**Prerequisite(s):** HK\*3401

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

## **HK\*3501 Human Anatomy: Prosection Fall Only (LEC: 3, LAB: 2) [0.75]**

First part of the two-semester course HK\*3501/2. A two-semester lecture and laboratory course in human anatomy which includes a detailed study of the skeleton, upper and lower limbs, thorax, abdomen, pelvis, perineum, head, neck and central nervous system. Labs involve observation of anatomical details using prosections and dissected specimens. This is a two-semester course offered over consecutive semesters. When you select it you must select HK\*3501 in the Fall semester and HK\*3502 in the Winter semester. A grade will not be assigned to HK\*3501 until HK\*3502 has been completed.

**Co-requisite(s):** HK\*3810 OR BIOM\*3200

**Restriction(s):** HK\*3401, HK\*3402 Registration in the BSC. Major in Human Kinetics or Bio-Medical Science. Instructor consent required.

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

## **HK\*3502 Human Anatomy Winter Only (LEC: 3, LAB: 2) [0.75]**

Second part of the two-semester course HK\*3501/2. A two-semester lecture and laboratory course in human anatomy which includes a detailed study of the skeleton, upper and lower limbs, thorax, abdomen, pelvis, perineum, head, neck and central nervous system. Labs involve observation of anatomical details using prosections and dissected specimens. This is a two-semester course offered over consecutive semesters. When you select it you must select HK\*3501 in the Fall semester and HK\*3502 in the Winter semester. A grade will not be assigned to HK\*3501 until HK\*3502 has been completed.

**Prerequisite(s):** HK\*3501

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

## **HK\*3600 Applied Human Kinetics I Fall Only (LEC: 3, LAB: 3) [0.75]**

This course covers laboratory techniques which are central to human biology, together with their underlying concepts. Human performance and function are evaluated through cellular, organic, systemic and whole person studies. The student's technical competence and conceptual understanding are emphasized.

**Prerequisite(s):** HK\*2270

**Co-requisite(s):** HK\*3810

**Restriction(s):** Registration in the Human Kinetics major.

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

**HK\*3810 Human Physiology II - Integrated Systems Fall Only (LEC: 4) [0.75]**

This course will build on the fundamental concepts and principles of communication systems developed in Human Physiology I and examine more complex physiological phenomena such as the control of blood volume and blood pressure, which integrates tissue of the cardiovascular system, the heart, vasculature and kidney, and acid-based physiology, which integrates the respiratory system and the kidney. Finally, all systems will be integrated to determine how the body responds to challenges such as altitude, exercise and shock (blood loss).

**Prerequisite(s):** HK\*2810

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

**HK\*4070 Clinical Biomechanics Winter Only (LEC: 3, LAB: 2) [0.50]**

This course covers functional anatomy, neurophysiology and mechanical characteristics of humans at the tissues and whole-body levels.

Pathomechanics of human movement resultant from disease, abuse or trauma will be examined. Special emphasis will be placed on etiology, testing and correction of functional disorders with special reference to balance, gait and orthopaedic biomechanics.

**Prerequisite(s):** ENGG\*2660 or (HK\*2270, HK\*3600)

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

**HK\*4230 Advanced Study in Human Health and Nutritional Sciences Summer, Fall, and Winter (LEC: 3) [0.50]**

The student will conduct independent literature research of an approved topic to be decided by the student in consultation with a faculty advisor. Students must make arrangements with both a faculty advisor and the course coordinator at least one semester in advance and the signature of the course coordinator will be required to select the course. A departmental registration form must be obtained from the course coordinator and submitted no later than the second class day of the semester in which the student is registered for the course.

**Prerequisite(s):** 12.00 credits

**Restriction(s):** Course coordinator consent required.

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

**HK\*4240 Occupational Biomechanics and Ergonomics Winter Only (LEC: 3, LAB: 2) [0.75]**

This course introduces the methods available for reducing musculoskeletal injuries in the workplace. Topics include: biomechanical, psychophysical, physiological, and integrated approaches to performing physical demands analyses, anatomy and etiology of low back injuries and upper limb disorders, principles of redesigning tasks to reduce the risk of injury, pre-employment screening and legislated guidelines. Students apply the course material to ergonomic assessments performed in industrial environments.

**Prerequisite(s):** ENGG\*1210 or HK\*3600

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

**HK\*4340 Genomics: Exercise and Disease Fall Only (LEC: 3) [0.50]**

This course is an in-depth examination of how exercise 1) effects gene transcription to influence elite performance (ie. training for sport) and 2) can be used as a therapeutic strategy to influence the expression of specific genes to recover the health of an individual (ie. exercising for health). The course represents a unique opportunity to understand the beneficial effects of physical activity and exercise at the genetic level.

**Prerequisite(s):** NUTR\*3360

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

**HK\*4360 Research in Human Health and Nutritional Sciences Summer, Fall, and Winter (LAB: 12) [1.00]**

The student will select a research topic and design and complete a project in an area of interest, in consultation with a faculty advisor. Students must make arrangements with both a faculty advisor and the course coordinator at least one semester in advance and the signature of the course coordinator will be required to select the course. A departmental registration form must be obtained from the course coordinator and submitted no later than the second class day of the semester in which the student is registered for the course.

**Prerequisite(s):** 12.00 credits

**Restriction(s):** Course coordinator consent required.

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

**HK\*4371 Research in Human Health and Nutritional Sciences I Summer, Fall, and Winter (LAB: 6) [0.50]**

First part of the two-semester course HK\*4371/2. The student will select a research topic and design and complete a project in an area of interest, in consultation with a faculty advisor. This is a two-semester course offered over consecutive semesters. When you select it you must select HK\*4371 in the first semester and HK\*4372 in the second semester. A grade will not be assigned to HK\*4371 until HK\*4372 has been completed. Students must make arrangements with both a faculty advisor and the course coordinator at least one semester in advance and the signature of the course coordinator will be required to select the course. A departmental registration form must be obtained from the course coordinator and submitted no later than the second class day of the semester in which the student is registered for the course.

**Prerequisite(s):** 12.00 credits

**Restriction(s):** Course coordinator consent required.

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

**HK\*4372 Research in Human Health and Nutritional Sciences II Summer, Fall, and Winter (LAB: 6) [0.50]**

Second part of the two-semester course HK\*4371/2. The student will select a research topic and design and complete a project in an area of interest, in consultation with a faculty advisor. This is a two-semester course offered over consecutive semesters. When you select it you must select HK\*4371 in the first semester and HK\*4372 in the second semester. A grade will not be assigned to HK\*4371 until HK\*4372 has been completed. Students must make arrangements with both a faculty advisor and the course coordinator at least one semester in advance and the signature of the course coordinator will be required to select the course. A departmental registration form must be obtained from the course coordinator and submitted no later than the second class day of the semester in which the student is registered for the course.

**Prerequisite(s):** HK\*4371

**Restriction(s):** Course coordinator consent required.

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

**HK\*4441 Advanced Study in Human Anatomy Fall Only (LEC: 1, LAB: 10) [1.00]**

First part of the two-semester course HK\*4441/2. This course will provide students who have completed HK\*3402 with the opportunity to pursue anatomical studies in an interdisciplinary fashion at the advanced level. Students will use their knowledge in anatomy to develop educational material and/or teach anatomical concepts and applications of human anatomy. This is a two-semester course offered over consecutive semesters. When you select it you must select HK\*4441 in the first semester and HK\*4442 in the second semester. A grade will not be assigned to HK\*4441 until HK\*4442 has been completed. Students must make arrangements with the course coordinator at least one semester in advance, and the signature of the course coordinator will be required to select the course. A departmental registration form must be obtained from the course coordinator and submitted no later than the second class day of the semester in which the student is registered for the course.

**Prerequisite(s):** HK\*3402, (HK\*3810 or HK\*3940)

**Restriction(s):** Course coordinator consent required.

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

**HK\*4442 Advanced Study in Human Anatomy Winter Only (LEC: 1, LAB: 10) [1.00]**

Second part of the two-semester course HK\*4441/2. This course will provide students who have completed HK\*3402 with the opportunity to pursue anatomical studies in an interdisciplinary fashion at the advanced level. Students will use their knowledge in anatomy to develop educational material and/or teach anatomical concepts and applications of human anatomy. This is a two-semester course offered over consecutive semesters. When you select it you must select HK\*4441 in the first semester and HK\*4442 in the second semester. A grade will not be assigned to HK\*4441 until HK\*4442 has been completed. Students must make arrangements with the course coordinator at least one semester in advance, and the signature of the course coordinator will be required to select the course. A departmental registration form must be obtained from the course coordinator and submitted no later than the second class day of the semester in which the student is registered for the course.

**Prerequisite(s):** HK\*4441

**Restriction(s):** Course coordinator consent required.

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

**HK\*4460 Regulation of Human Metabolism Winter Only (LEC: 3) [0.50]**

The course focuses on the underlying metabolic events that occur in association with exercise. Skeletal muscle metabolism and substrate delivery are discussed with respect to the intracellular biochemical events integrated with both the endocrine and the chemical aspects of neural mechanisms.

**Prerequisite(s):** (HK\*3810 or HK\*3940), NUTR\*4210

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

**HK\*4510 Teaching, Learning and Knowledge Transfer Summer, Fall, and Winter (LAB: 12) [1.00]**

In consultation with a faculty advisor, the student will select, design and complete an independent project on the scholarship of teaching, learning and/or knowledge transfer in human health. Students must make arrangements with both a faculty advisor and the course coordinator at least one semester in advance and the signature of the course coordinator will be required to select the course. A departmental registration form must be obtained from the course coordinator and submitted no later than the second class day of the semester in which the student is registered for the course.

**Prerequisite(s):** 10.00 credits including BIOL\*1080

**Restriction(s):** Course coordinator consent required.

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

**HK\*4511 Teaching, Learning & Knowledge Transfer I Summer, Fall, and Winter (LAB: 6) [0.50]**

First part of a two-semester course HK\*4511/2. In consultation with a faculty advisor, the student will select, design and complete an independent project on the scholarship of teaching, learning and/or knowledge transfer in human health. This is a two-semester course offered over consecutive semesters; when you select it you must select HK\*4511 in the first semester and HK\*4512 in the second semester (a grade will not be assigned to HK\*4511 until HK\*4512 has been completed). Students must make arrangements with both a faculty advisor and the course coordinator at least one semester in advance and the signature of the course coordinator will be required to select the course. A departmental registration form must be obtained from the course coordinator and submitted no later than the second class day of the semester in which the student is registered for the course.

**Prerequisite(s):** 10.00 credits including BIOL\*1080

**Restriction(s):** Course coordinator consent required.

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

**HK\*4512 Teaching, Learning & Knowledge Transfer II. Summer, Fall, and Winter (LAB: 6) [0.50]**

Second part of a two-semester course HK\*4511/2. In consultation with a faculty advisor, the student will select, design and complete an independent project on the scholarship of teaching, learning and/or knowledge transfer in human health. This is a two-semester course offered over consecutive semesters; when you select it you must select HK\*4511 in the first semester and HK\*4512 in the second semester (a grade will not be assigned to HK\*4511 until HK\*4512 has been completed). Students must make arrangements with both a faculty advisor and the course coordinator at least one semester in advance and the signature of the course coordinator will be required to select the course. A departmental registration form must be obtained from the course coordinator and submitted no later than the second class day of the semester in which the student is registered for the course.

**Prerequisite(s):** HK\*4511

**Restriction(s):** Course coordinator consent required.

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

**HK\*4550 Human Cardio-respiratory Physiology Fall Only (LEC: 3) [0.50]**

The central focus of this course is a comprehensive examination of the effects of a variety of work parameters on normal cardio-respiratory adjustments required to meet metabolic demands. Immediate adjustments to increase metabolic rate as well as long term cardio-respiratory adaptability will be discussed.

**Prerequisite(s):** HK\*3810 or HK\*3940

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

**HK\*4600 Applied Human Kinetics II Winter Only (LEC: 3, LAB: 3) [0.75]**

The objective of this course is to expand on the introductory laboratory practices developed in HK 3600 Applied Human Kinetics I. Students will examine the functioning of a human body at rest and in motion, while learning clinical and advanced laboratory techniques. The students will be introduced to the underlying concepts of various physiological and biomechanical measures in lecture. Subsequently, the principles from the lecture will be used to make direct measures in the laboratory, with an emphasis on understanding exercise physiology, clinical testing practices, and integrative approaches to studying human movement. Students will be asked to critically analyze the laboratory measures and findings, and to integrate the lecture and laboratory material in formalized laboratory reports.

**Prerequisite(s):** HK\*3600

**Restriction(s):** Restricted to students in Human Kinetics.

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph

**HK\*4610 Health and Injury Biomechanics Fall Only (LEC: 3, LAB: 2) [0.50]**

This course presents an overview of bone and joint function from a biomechanics perspective, within the framework of health and injury. Particular emphasis is placed on the influence of biomechanical signals on the regulation of bone and joint structure and function. Individual diseases, such as osteoarthritis, will be considered as they impact the various tissues of the joint (cartilage, ligament and bone) and the neuromuscular system. The laboratory will provide supplementary material illustrating particular aspects of musculoskeletal function including in vivo and in vitro biomechanical testing.

**Prerequisite(s):** ENGG\*3150 or HK\*2270

**Department(s):** Department of Human Health and Nutritional Sciences

**Location(s):** Guelph