Queen's University
School of Kinesiology and Health Studies

Course Name: **KNPE 354/3.0** Occupational Biomechanics and Physical Ergonomics	**Course Instructor:**	**Contact Hours:** Lectures: 2 x 1.5 hrs/wk / 12 weeks **Prerequisite:** KNPE 254/3.0 KINE Plan level 2 or above. **Exclusion:** KNPE 253/3.0 if taken before 2014-15.

Course Purpose:

The purpose of this course is to prepare you with the introductory knowledge and skills required to understand the practice of physical ergonomics. You will also learn how to apply biomechanical principles to evaluate occupational performance.

Course Texts:

There are no required textbooks for this course. For those who are interested, and for additional information on the lecture topics, see:

Chaffin, D.B, Andersson, G.B.J., & Martin, B.J. (2006). Occupational Biomechanics. 4th Edition. New York: J Wiley & Sons.

Nordin, M., & Frankel, V.H. (2012). Basic Biomechanics of the Musculoskeletal System. 4th Edition. Maryland: Lippincott Williams and Wilkins.

Lecture notes and supplementary readings will be posted on onQ.

Learning Outcomes:

- Describe the role of ergonomics as scientific process that can be applied to improve workplace productivity and decrease injury risks.
- Describe the structure and function of the musculoskeletal system in the context of occupational performance and associated musculoskeletal disorders.
- Observe and report on physical demands in the workplace.
- Apply biomechanical methods, self-report surveys and ergonomic hazard assessment tools to evaluate the ergonomics of a workstation.
- Analyze and interpret ergonomics and occupational biomechanics data to identify high-risk work tasks.
- Critically review ergonomics literature
- Clearly and concisely communicate (oral and verbal) ergonomics information

Course Evaluation:

Musculoskeletal Disorders Root-Cause Analysis	15%
Office Workstation Evaluation	15%
Ergonomic Hazard Tools – Group Project	15%
Physical Demands Analysis – Group Project	15%
Weekly In class and OnQ Discussions	15%
Final Exam – Individual Presentation	25%

Course Outline	
Introduction	Anthropometry
Biomechanical terms and concepts	Hazard tool assignment presentations
Tissue mechanics	Physical demands description (PDD)
Structure and function of the Musculoskeletal System	Manual Material Handling Limits
An overview of common workplace injuries	Practical guidelines for workplace and machine control layout
Ergonomics as a process – case study	Worker selection, Training, and Personal Protective Device Consideration
Office Ergonomics	Presentation skills
Bioinstrumentation	