

<p><b>Course Name:</b>  <b>KNPE 354/3.0</b></p> <p>Occupational Biomechanics and Physical Ergonomics</p>	<p><b>Course Instructor:</b></p> <p>Dr. Patrick Costigan</p>	<p><b>Contact Hours:</b>  Winter 2021 – Remote Delivery</p>													
		<p><b>Prerequisite:</b>  KNPE 254/3.0  KINE or PHED Plan level 2 or above.</p>													
		<p><b>Exclusion:</b>  KNPE 253/3.0 if taken before 2014-15.</p>													
<p><b>Course Purpose:</b></p> <p>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.</p>		<p><b>Course Texts:</b></p> <p>There are no required textbooks for this course. For those who are interested, and for additional information on the lecture topics, see:</p> <p>Chaffin, D.B, Andersson, G.B.J., &amp; Martin, B.J. (2006). Occupational Biomechanics. 4<sup>th</sup> Edition. New York: J Wiley &amp; Sons.</p> <p>Nordin, M., &amp; Frankel, V.H. (2012). Basic Biomechanics of the Musculoskeletal System. 4<sup>th</sup> Edition. Maryland: Lippincott Williams and Wilkins.</p> <p>Lecture notes and supplementary readings will be posted on onQ.</p>													
<p><b>Course Objectives:</b></p> <ul style="list-style-type: none"> <li>• Describe the role of ergonomics as scientific process that can be applied to improve workplace productivity and decrease injury risks.</li> <li>• Describe the structure and function of the musculoskeletal system in the context of occupational performance and associated musculoskeletal disorders.</li> <li>• Observe and report on physical demands in the workplace.</li> <li>• Apply biomechanical methods, self-report surveys and ergonomic hazard assessment tools to evaluate the ergonomics of a workstation.</li> <li>• Analyze and interpret ergonomics and occupational biomechanics data to identify high-risk work tasks.</li> <li>• Critically review ergonomics literature</li> <li>• Clearly and concisely communicate (oral and verbal) ergonomics information</li> </ul>	<p><b>Course Evaluation:</b></p> <table border="0"> <tr> <td>Musculoskeletal Disorders Root-Cause Analysis</td> <td>15%</td> </tr> <tr> <td>Office Workstation Evaluation</td> <td>10%</td> </tr> <tr> <td>Ergonomic Hazard Tools – Group Project</td> <td>15%</td> </tr> <tr> <td>Physical Demands Analysis – Group Project</td> <td>15%</td> </tr> <tr> <td>Identifying High Risk Tasks Using a Hazard Screen</td> <td>15%</td> </tr> <tr> <td>Identifying High Risk Using Biomechanics</td> <td>15%</td> </tr> <tr> <td>Final Exam – Individual Presentation</td> <td>15%</td> </tr> </table>	Musculoskeletal Disorders Root-Cause Analysis	15%	Office Workstation Evaluation	10%	Ergonomic Hazard Tools – Group Project	15%	Physical Demands Analysis – Group Project	15%	Identifying High Risk Tasks Using a Hazard Screen	15%	Identifying High Risk Using Biomechanics	15%	Final Exam – Individual Presentation	15%
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**Course Outline**

Introduction to ergonomics and biomechanics key term review	What it's Like to be an Ergonomist
Biomechanical terms and concepts	MSD Hazard Assessment Tools
Biomechanical loading on the MSK system: Biomechanics of Bone	Interpreting MSD Hazard Assessment Data
Biomechanics of Tendons, Ligaments and Muscles	Occupational Task Simulations
Critically Reviewing Ergonomics Literature	PDD Presentations
Overview of Common Work-related Injuries	Occupational Biomechanical Modeling: Fundamentals
Ergonomics as a Process	Occupational Biomechanical Modeling: 2D Static Modeling
Office Ergonomics	Interpreting Biomechanical Data
Bioinstrumentation	Occupational Task Simulations
Anthropometry / Physical Demands	

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