

<p>Course Name: KNPE 450/3.0</p> <p>Ergonomics and Design</p>	<p>Course Instructor:</p> <p>Dr. Clare Davies</p>	<p>Contact Hours:</p> <p>Winter 2021 – Remote Delivery</p>																
<p>Course Description:</p> <p>This course provides an overview of ergonomic problems that are addressed in engineering design including biomechanical, physical and physiological issues. Case studies will range from the design of vehicle cockpits to process control rooms, from industrial manual materials handling tasks to human directed robots, and from domestic tools to biomechanical devices.</p>		<p>Prerequisites:</p> <p>(ANAT 101/3.0 or ANAT 315/3.0) and (KNPE 254/3.0 or KNPE 353/3.0) or 6.0 units in PHYS at the 100 level) Level 4 in a HLTH, KINE or PHED plan.</p> <p>Exclusion:</p> <p>MECH 495/3.0, PT 419/3.0, RHBS 428/3.0</p> <p>Course Text:</p> <p>Human Factors in Engineering and Design, 7th Edition. Saunders and McCormick, McGraw-Hill Inc., New York, 1993. In 2019 became unavailable. Queen's has bought the copyright to print the textbook in full which can be purchased at the bookstore.</p> <p>All required materials will be posted on onQ.</p>																
<p>Learning Outcomes:</p> <ul style="list-style-type: none"> Identify and describe ergonomic issues associated with systems and devices involving human interfaces, with attention to the range of abilities expected in the population. Design and describe practical user-centred designs of devices and systems that incorporate current best practices in the application of ergonomic design principles, including the use of universal design methods. Understanding risks involved in workplace environments from the physiological and biomechanical perspectives. Experience Interdisciplinary Interaction between kinesiology and engineering students in assessment of risk for manual materials handling. 	<p>Evaluation:</p> <table border="0"> <tr> <td>MC Development</td> <td>10%</td> </tr> <tr> <td>Quizzes</td> <td>10%</td> </tr> <tr> <td colspan="2"><u>Assignments</u></td> </tr> <tr> <td>Workspace Design</td> <td>30%</td> </tr> <tr> <td>Manual Materials Handling</td> <td>5%</td> </tr> <tr> <td>MMH Assignment</td> <td>10%</td> </tr> <tr> <td>Midterm</td> <td>10%</td> </tr> <tr> <td>Final Exam</td> <td>25%</td> </tr> </table>		MC Development	10%	Quizzes	10%	<u>Assignments</u>		Workspace Design	30%	Manual Materials Handling	5%	MMH Assignment	10%	Midterm	10%	Final Exam	25%
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<p>Lecture Schedule</p>	<p>Tutorial Schedule</p>																	

Introduction	Anthropometrics
Anthropometrics	Basic Biomechanics
Work Station Design	Back Biomechanics
Arrangements of Components	Integrated Evaluation Methods
Structure of MS System and Intro. Biomechanics	Advanced Construction Methods
Work Physiology	Upper Extremity Assessment and Tool Design
Manual Materials Handling	Light and Illumination
NIOSH Lifting Guidelines	Noise and Vibration
Control of Speed and Accuracy of Movement	
Human Control of Systems	
Controls and Data Entry Devices	
Hand Biomechanics and Rapid Upper Limb Assessment	
Hand Tool Design	
Illumination	
Lighting, Sound and Noise	
Noise Control	
Motion Effects and Protection	
Impact Injuries and Protection	
Regulation of Heat and Thermal Comfort	

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