

## MECH4350 Indoor Air Quality in Buildings

<b>Course Code:</b> MECH4350	<b>Course Title:</b> Indoor Air Quality in Buildings
<b>Required Course Or Elective Course:</b> Elective	<b>Terms Offered (Credits):</b> Fall (3 credits)
<b>Faculty In Charge:</b> Edwin Chi-Yan Tso	<b>Pre/Co-Requisites:</b> MECH 2310
<b>Course Structure:</b> Lecture: 2 days per week, 1.5 hours	
<b>Textbook/Required Material:</b> (1) Class notes, (2) online lecture materials	
<b>Course Description:</b> Indoor air pollutants in buildings and their transport dynamics with respect to building ventilation systems. Design methodology in handling indoor air quality in buildings and enclosed spaces. Building environmental assessment method.	
<b>Course Topics:</b> <ol style="list-style-type: none"><li>1. Overview of Indoor air quality in buildings</li><li>2. Indoor carbon dioxide</li><li>3. Indoor Radon Pollution</li><li>4. Indoor Aerosol Science</li><li>5. Particle Removal and Air Cleaner Performance Evaluation</li><li>6. VOCs, Measurement and Sorption Science and Purification Technology</li><li>7. Indoor Ozone Pollution, Combustion Related Pollutants</li><li>8. Bio-aerosol and Thermal Comfort</li><li>9. Ventilation Theory and Standards</li><li>10. Emerging Topics in Indoor Air Quality</li></ol>	
<b>Course Objectives:</b>	<ol style="list-style-type: none"><li>1. To provide students comprehensive understanding on an emerging area for indoor air quality in buildings. Topics include discussion of indoor air pollutants in buildings and enclosed spaces and their transport dynamics with respect to building ventilation systems and indoor/outdoor flow characteristics.</li><li>2. To address pollutant characteristics such as airborne particulate, radon gas and daughters, volatile organic compounds, bio-aerosols. Other areas such as thermal comfort, sick building syndrome and odor theory will be followed.</li><li>3. To introduce the various methods in handling indoor air quality in buildings. Ventilation and indoor air quality measurement techniques will be demonstrated.</li></ol>
<b>Course Outcomes:</b>	<ol style="list-style-type: none"><li>A. The students will have a thorough understanding of the fundamental knowledge and emerging topics in indoor air quality in buildings, including the types and effects of indoor air pollutants, the response of indoor air quality on air handling system designs, etc. through the lectures and group project.</li><li>B. Be equipped with knowledge in identifying indoor air quality problems and indoor pollution sources, designing ventilation and air cleaning systems, other mitigation strategies in dealing with the problems.</li></ol>

	C. Be able to apply building environmental assessment method and modern technology in achieving energy efficient and green building design and operation.
<b>Assessment Tools:</b>	Midterm - 30% Project – 30% Final examination - 40%