

## Syllabus

<b>Course prefix and number, section number, and title</b>	<b>(50:750:374) Energy and the Environment</b> (Fulfills the Gen Ed PLS requirement)
<b>Semester term and credit hours</b>	Fall 2023, 3 Credit Hours
<b>Class meeting days/times/location</b>	TBD
<b>Instructor name, contact information, and office hours</b>	<b>Dr. Hong Fang</b> Email: hfangtom@gmail.com Office: TBD Office Hours: TBD, or by appointment
<b>Course description</b>	<b>Traditional power sources:</b> Coal, oil, and gas. <b>Renewable energy and the environment:</b> Solar power, hydrogen and fuel cells, nuclear energy (fission and fusion), wind, tidal, geothermal, and hydrodynamics energy. <b>Application of renewable energy:</b> Mobile vehicles, energy grid, household. <b>Energy policy:</b> National scientific and industrial policies in energy.
<b>Course prerequisites</b>	No Prerequisites.
<b>Student learning outcome</b>	<ol style="list-style-type: none"> <li>1. Learn sciences of renewable energy and the difference from conventional energy;</li> <li>2. Learn the important advantages and shortcomings as well as the environmental impacts of renewable energy including electrochemical energy, hydrogen and fuel cells, nuclear power, wind, tidal, geothermal, and hydrodynamic energy.</li> <li>3. Learn the key applications of renewable energy, including electric vehicles, long-duration energy storage, and carbon-neutral economy.</li> <li>4. Learn the causes of energy crises and suggestions for energy policy.</li> <li>5. Understand the importance of carbon-neutral economy and sustainability of energy.</li> </ol>
<b>Reference Book</b>	<i>Fundamentals and Applications of Renewable Energy (2019, McGraw-Hill Education)</i> by Mehmet Kanoğlu, Yunus Çengel, and John Cimbala.

<b>Course schedule</b>	<p>Ch. 1. Introduction to traditional and renewable energy sources (Coal, oil, gas, and renewable energy).</p> <p>Ch. 2. Fundamentals in energy transfer and conversion (Basics of thermodynamics, heat transfer, fluid mechanics, and thermochemistry).</p> <p>Ch. 3-4. Solar energy and applications (Solar cells)</p> <p>Ch. 5. Nuclear energy (Fission and fusion; Special topic: National Ignition project)</p> <p>Ch. 6. Wind energy (Turbine)</p> <p>Ch. 7. Hydropower</p> <p>Ch. 8. Geothermal energy</p> <p>Ch. 9. Tidal energy</p> <p>Ch. 10. Hydrogen and fuel cells (hydrogen production and storage)</p> <p>Ch. 11. Renewable energy in economics and environment</p>
<b>Final Exam</b>	TBD
<b>Grading scale</b>	<p>Letter grades will be assigned on the following scale:  A: 90-100%, B: 80-89%, C: 70-79%, D: 60-69%, and F: &lt;60%</p> <p>Depending upon the class performance, these margins may be modified, benefiting the students.</p>
<b>Grade categories and weights</b>	<p>25 % Homework (Homework will be assigned at the end of each chapter).</p> <p>10 % Quizzes (Quizzes will be given at the end of each chapter. The day of the quiz will be announced a week in advance).</p> <p>40 % Midterm Exams (times TBD).</p> <p>25 % Final Exam (This will be comprehensive and will cover all materials covered in the class).</p>