College of Engineering

Department of Civil Engineering

CE 549 Special Topics in Environmental Engineering

Credit and Contact hours	3/ 3 (Lectures), 0 (Tutorials), 0 (Laboratory)
Required, or Elective	Required for a MSCE degree
Course Description	Study of special topics in environmental engineering with emphasis on current problems. Participants are expected to write a report and give an oral presentation on an environmental topic of their choice and of local concern. The work may include literature search, laboratory work and field investigation.
Prerequisites or Co-requisites	- Under graduate Course CE 433 - Under graduate Course CE 448 - Under graduate Elective Course CE 444
Course Learning Outcomes	Students completing this course successfully will be able to

Course Learning Outcomes	***Related Program Outcomes***
CLO1: Recognize and identify the current environmental issues and the demands that must be known by engineers to solve the complex environmental problems.	**K1**
CLO2: Identify sources, types, and composition of the pollutant, in addition to the physical, chemical, and biological properties to conduct and design environmental engineering experiments.	**K1**
CLO3: Determine quantities of the pollutant or problem in concern that can be treated, and perform quality monitoring plans to meet guidelines.	**S1**
CLO4: Develop design strategies depending on the contemplating environmental issue to mitigate the impact of the pollutants.	**S1**
CLO5: Utilize management and legislation for source reduction and treatment requirements to maintain the quality of the final waste/product.	**S1**
CLO6: Select equipment and setting performance standards from the perspective of an environmental engineer and system manager	**C2**

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<tr><td></td><td><table><tr><td>CLO7: Discuss the current environmental problems and evaluate its solutions through the available recent literature</td><td>C1</td></tr></table></td></tr>
<tr><td>Student Outcomes related to this Course</td><td>K1. Recognize advanced engineering knowledge, concepts and techniques to identify, interpret and analyze complex and real-life engineering problems.
S1. Provide solution for complex and real-life engineering problems through critical thinking and using modern engineering tools and identify its impact on social and ethical issues.
C1. Criticize and discuss scientific research reports /papers related to Civil Engineering issues with high level of ethics and proficiency, independently, or as a team work.
C2. Design novel advanced Civil Engineering systems and evaluate its performance and effectiveness for engineering practice and its impact on society.</td></tr>
<tr><td>Topics Covered</td><td><table><tr><th>List of Topics</th><th>Related CLOs</th></tr><tr><td>1. Reverse Osmosis for Water Desalination</td><td>CLO1</td></tr><tr><td>2. Water Reuse & Reclamation</td><td>CLO2</td></tr><tr><td>3. Advanced Wastewater Treatment</td><td>CLO4</td></tr><tr><td>4. Solid Waste Management</td><td>CLO3</td></tr><tr><td>5. Industrial Wastewater treatment</td><td>CLO5</td></tr><tr><td>6. Odor Control for WWTPs.</td><td>CLO7</td></tr><tr><td>7. Air Pollution Control.</td><td>CLO6</td></tr><tr><td>8. Environmental Impact Assessment and Reporting</td><td>CLO2</td></tr></table></td></tr>
<tr><td>Textbook(s) and Other Required Material</td><td>1. Different Environmental Engineering textbook related to the contemplating issue and treatment strategies.</td></tr>
<tr><td>Grading System</td><td>Assignments 20%
Research Work 20%
Midterm Exam 20%
Final Exam 40%</td></tr>
<tr><td>Instructors</td><td>Prof. Ashraf Refaat, Office 2A4, refaat@ksu.edu.sa</td></tr>
<tr><td>Date of Review</td><td>February, 2021</td></tr>
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