



## Introduction to Environmental Engineering

<b>Course Code</b>	457.210A (College of Engineering)		
<b>Class Times</b>	Mon/Wed/Thu Type B(13:00~16:00)	<b>Classroom</b>	Bldg 35 Rm. 432
<b>Equivalent Year Level</b>	2	<b>Course Credit</b>	3
<b>Instructor</b>	Jong Kwon Choe	<b>Sessions</b>	15(45 class hours)
<b>Office</b>	Bld 35. Rm. 402	<b>Email</b>	jkchoe@snu.ac.kr

### □ Instructor's Profile



#### **Jong Kwon Choe**

Assistant Professor, Department of Civil and Environmental Engineering, Seoul National University

Jong Kwon Choe has worked as an assistant professor in the Department of Civil and Environmental Engineering at Seoul National University since Fall 2016. Prior to joining SNU, he worked as a post-doctoral research fellow at Stanford University and as an assistant professor at Clarkson University in the U.S. He majors in environmental engineering with a specific interest in water and wastewater treatment technologies, application of green chemistry, sustainability analysis, and synthesis and characterization of advanced materials for environmental application. In addition to the undergraduate class of [Environmental Engineering], he teaches [Physicochemical Processes in Environmental Engineering] and [Advanced Water Quality] courses for graduate students.

#### **Education**

Ph.D., Dept. of Civil and Environmental Engineering, University of Illinois at Urbana Champaign

M.S., Dept. of Civil and Environmental Engineering, University of Illinois at Urbana Champaign

B.S., Dept. of Civil Engineering, The Cooper Union for Advancement of Science and Art

#### **Expertise**

Water treatment technologies, catalysis, life cycle assessment, x-ray spectroscopic characterization

#### **Most Recent Works**

"A New Bioinspired Perchlorate Reduction Catalyst with Significantly Enhanced Stability via Rational Tuning of Rhenium Coordination Chemistry and Heterogeneous Reaction Pathway" *Environmental Science & Technology*, Vol. 50, 5874-5881.

"Evaluation of a Hybrid Ion Exchange-Catalyst Treatment Technology for Nitrate Removal from Drinking Water" *Water Research*, Vol 96, 177-187.

"Degradation of Amino Acids and Secondary Structure in Model Proteins and Bacteriophage MS2 by Chlorine, Bromine and Ozone" *Environmental Science & Technology*, Vol 49, 13331-13339



## □ Course Information

Course Description	This course is an introductory class of environmental engineering designed for benefit of any students at college level. For those who seeks for environmental engineering as a major, the class will help build up general background on the subject for future in-depth study. For others, the class will provide college-level knowledge to help understand environmental issues in everyday life. This class will discuss causes, effects, and monitoring of various environmental issues such as water quality and quantity, air quality, climate change, waste management, noise pollution, and engineering solutions for these issues concerns as well as environmental sustainability concept.
Course Evaluation	Class participation 50% Midterm exam 25% Final exam 25%  <b>Attendance</b> will be important for keeping up with class. Good attendance and <b>active participation</b> will be reflected in grade.
Course Materials	Hand-outs
Class Policy	<i>(Insert as necessary)</i>
Etc. <i>(e.g. Guidelines)</i>	<ul style="list-style-type: none"> <li>● First half of each session will be a lecture on each topic and second half of each session will be used for in-class exercises, discussion, and group activities including hands-on experiments, design of sustainable city, etc.</li> <li>● Mid-term and final exam will be based on lecture given in class, not textbook.</li> </ul> <p>* The class will be run with hand-outs only, which is designed to be stand-alone. In other words, students will be able to understand the class topics without the help of any texts other than the hand-outs. However, those who want supplementary readings may obtain the textbook “<u>Davis, M. L. and Masten, S. J. (2014) Principles of Environmental Engineering and Science, 3<sup>rd</sup> ed., McGraw-Hill.</u>” The hand-outs are organized and written based on the textbook.</p>

## □ Course Schedule

Session	Description	Etc
1	Introduction	
2	Environmental system reactor – how to make a complex problem into a simpler model?	
3	Ecosystem – how is our society and surrounding environment look like?	



4	Risk – how do we understand the hazard from the environmental issues?	
5	Water Quality – What are in water?	
6	Water Treatment – How do we treat water?	
7	<i>Mid-term Exam</i>	
8	Hydrology – How much water do we have and where?	
9	Wastewater Treatment – How do we clean our used water?	
10	Air Pollution I – What causes air pollution and how can we model their spread into air?	
11	Air Pollution II – Indoor quality, ozone depletion, global warming	
12	Waste Management – How can we take care of our waste?	
13	Noise Pollution	
14	Sustainability– How can we go for sustainable development?	
15	<b>2020 SNU ISP Final Exam</b>	