DEPARTMENT OF CIVIL AND CONSTRUCTION ENGINEERING

SOUTHERN POLYTECHNIC COLLEGE OF ENGINEERING AND ENGINEERING TECHNOLOGY

COURSE SYLLABUS

COURSE TITLE:	**Introduction to Environmental Engineering**	**TERM:**	Fall
		YEAR:	2015
COURSE:	CE 3702	**TIME:**	T 3:30 – 4:45 pm (Sec 01)
SECTION NO.:	01 (Hybrid); **Meeting: T**		R 3:30 – 4:45 pm (Sec 02)
	02 (Hybrid); **Meeting: R**	**PLACE:**	**L-120**
INSTRUCTOR:	**Dr. M. A. Karim, P.E.**	**OFFICE LOCATION:**	**M-162B**
OFFICE HOURS:	T R 11:00 – 12:00 pm	**OFFICE PHONE:**	(678) 915-3026
	T R 01:30 – 03:00 pm	**CELL PHONE:**	(804) 986-3120
	*Other hours by appointment	**E-MAILS:**	mkarim4@kennesaw.edu
			makarim@juno.com

DEPARTMENTAL PHONE: (678) 915-4220; **MY WEBSITE:** http://facultyweb.kennesaw.edu/mkarim4

NUMBER OF CREDIT HOURS: 3-0-**3** (Lecture-Lab-**Total**)

PREREQUISITS: ENGR 3343 (Fluid Mechanics) and CHEM 1212K (Chemistry II)

COREQUISITS: None

COURSE DESCRIPTION: Introduction to environmental engineering issues, legal aspects, engineering solutions, and basic approaches to abatement system design including water supply, water treatment, water quality management, wastewater treatment, air pollution control, solid and hazardous waste management, and environmental impacts.

REQUIRED or ELECTIVE: **Required**

REQUIRED TEXT: **Introduction to Environmental Engineering** by Mackenzie L. Davis and David A. Cornwell**,** McGraw-Hill Book Company, Current Edition (Fifth Edition, 2013; ISBN: 978-0-7-340114-0).

REFERENCES: None

OTHER MATERIALS: Additional handouts may be provided as needed for face-to-face options. It is recommended that students take notes in a three ring binder since they may be receiving handouts throughout the semester. KSU **email** and **Desire2Learn** (**D2L**) Brightspace systems will be used for messages and content delivery, respectively. Students should access these sites regularly.

COURSE OBJECTIVES: To introduce students to the integrated science, engineering, design and management concepts of engineered environmental systems. The course will cover environmental regulations and standards, environmental parameters, mass balance and natural systems, water supply system, water quality management, water and wastewater treatment, air pollution control, solid and hazardous waste management, and an overview of contemporary global environmental engineering issues.

COURSE LEARNING OUTCOMES: Upon successful completion of this course, students shall be able to:

1. Interpret the Federal/State environmental regulations and standards as well as their impact.
2. Solve environmental engineering problems using mass balance equation.
3. Define public water supply system, interpret the importance of water supply system, and calculate the pressure at any point in water supply system using energy equation.
4. Characterize source water and recommend the best available technologies (BAT) for physical and chemical treatment of drinking water.
5. Know the importance of surface water quality management and estimate oxygen depletion on surface waters.
6. Characterize wastewater and recommend the BAT for physical, chemical and biological treatment of wastewater.
7. Identify common air pollutants and their pathways and determine the various technologies available for air pollution control.
8. Interpret selected contemporary global environmental issues such as global warming, ozone depletion, acid rain, and emerging contaminants.
9. Define, classify, and characterize the solid waste and discuss the solid waste management technologies.
10. Define, identify, classify, and characterize the hazardous waste and interpret and discuss the issues and legislations related to hazardous waste management.

COURSE REQUIREMENTS:

1. **Attendance Policy:** Students are required to attend the class on-campus the day the class is supposed to meet on-campus. Advance notice of an absence should be provided whenever possible. Makeup experiments, exams, quizzes, and acceptance of late assignments/reports will be considered only for documented medical reasons, real emergency circumstances, or other university sponsored activities. The students are solely responsible for managing their enrollment status in this course. Nonattendance does not constitute a withdrawal from the course.

2. **Computer Requirements:** Students will need a working computer with internet connection, headphone, and microphone for attending live group or class room meetings in Wimba Classroom /Go to Meetings. Students are encouraged to logon to Desire 2 Learn (**D2L**) Brightspace daily basis to keep up with the course requirements and finish the weekly task by the end of each week.

3. **Student Responsibility:** Distance learning with hybrid course requires more individual discipline than traditional classes, and requires that students have at least some control over their time and schedule. It is not easier or less time than face-to-face courses. Students may need to spend 5 - 10 hours each week to complete the necessary tasks. Students are supposed to start with watching the course introduction video and reading the syllabus, and then taking the syllabus quiz. Until the students take the syllabus quiz and score **75%** or more, the subsequent modules/topics will not show up in the course content for his/her review and use. The students will have up to 5 attempts for the syllabus quiz. Also students are suggested to be familiar with the NCEES FE Exam Handbook that is part of the Welcome module. Students may need to use this document throughout the semester. Students can print the Environmental Engineering section of the Handbook and keep it with him/her during the study. Students are suggested to review the announcements and calendar events daily that may be posted in D2L.

4. **Netiquette:** The rules of behavior in the internet. Please review the netiquette provided in the link, http://www.education.com/reference/article/netiquette-rules-behavior-internet/ and follow it closely throughout the semester.

5. **Class Decorum:** No cell phone use, checking emails, eating, and/or multitasking are allowed during the class. For emergency, cell phone can be operated in vibration mode; however, students can receive an emergency call only stepping out of the class room. No feet on the table and/or on the nearby chair are allowed during the class. It is also encouraged not to bring any foods in the class.

6. **Homework:** Homework may be assigned for this course. Homework assignments must be finished, scanned in pdf with a file name as "HW#2-LastName.pdf" (example name for 2nd homework) and submitted in the corresponding dropbox by the end of the week and/or any other date assigned by the instructor. Dropbox will show the due date in D2L. Late homework WILL NOT be accepted. Exceptions may be considered in case of illness, serious emergencies, or other university sponsored activities. However, appropriate evidence must be presented in order to qualify for exceptions. Show the detail works for full credit.

7. **Quizzes:** All quizzes will be at the end of each module that the students have to complete. Quiz questions are randomly selected from a question library for each topic and each question carries 2 points. Quiz will be available for two to three days at the end of the Module week and two attempts will be allowed for each quiz. Time allowed for each quiz is 45 to 60 minutes. NO make-up quizzes will be given. Exceptions may be considered in case of illness, serious emergencies, or other university sponsored activities. However, appropriate evidence must be presented in order to qualify for exceptions.

8. **Exams:** There will be two exams: two **midterms** and one **Final**. All exams will be proctored and closed book unless advised otherwise. Students have to come to KSU campus to take the exams. Out of town students have to arrange a proctor and an exam facility approved by the course instructor. The date of the exam will be posted in D2L as an announcement and in D2L Calendar. NO make-up exams will be given. Exceptions may be considered in case of illness, serious emergencies, or other university sponsored activities. However, appropriate evidence must be presented in order to qualify for exceptions. Graded exams will be returned to

students; however, students need to preserve them until the grades are finalized and show them to the instructor if there are any disputes in grades. ***No formula sheets will be provided or allowed. However, students are required to have a hard copy of the current NCEES FE Exam Handbook or print it from the NCEES website, if available***.

9. **Calculator Use Policy:**
   - **Casio:** All fx-115 models. Any Casio calculator must contain fx-115 in its model name. Examples of acceptable Casio fx-115 models include (but are not limited to): fx-115 MS, fx-115 MS Plus, fx-115 MS SR, fx-115 ES, fx-115 ES Plus.
   - **Hewlett Packard:** The HP 33s and HP 35s models, but no others.
   - **Texas Instruments:** All TI-30X and TI-36X models. Any Texas Instruments calculator must contain either TI-30X or TI-36X in its model name. Examples of acceptable TI-30X and TI-36X models include (but are not limited to): TI-30Xa, TI-30Xa SOLAR, TI-30Xa SE, TI-30XS Multiview, TI-30X IIB, TI-30X IIS, TI-36X II, TI-36X SOLAR, TI-36X Pro.

10. **Discussion/Chat:** Discussion/chat may be assigned for the course. If so, the topics will be selected and posted in D2L each week or as assigned. Students need to participate and respond and/or create new topic for discussion/chat to receive the grades assigned for discussion/chat.

11. **What is Plagiarism?** KSU defines Plagiarism as the practice of taking someone else's work or ideas and passing them off as one's own. When unaware or uncertain on how to properly cite a particular source, please do not neglect to add the citation — KSU considers not doing so as plagiarism. If you have questions on how to cite your work, please contact me immediately! For more information, please refer to the "Plagiarism Policy" under the *Policies* section of this syllabus.

12. **Plagiarism Policy:** KSU considers committing plagiarism as an act of academic dishonesty, and takes all occurrences very seriously. Any instances where academic dishonesty is suspected will result in an automatic grade of a zero for all students involved. The instructor reserves the right to remove any student from the class if the student's behavior is of a disruptive nature or if there is an evidence of academic dishonesty. Further disciplinary action may be taken such as suspension or expulsion from the University.

13. **FERPA:** The Family Education Rights and Privacy Act (FERPA) is a federal law designed to protect the privacy of educational records by limiting access to these records, and precludes Southern Polytechnic State University from providing information regarding the student to anyone without written authorization. Examples of records not released are grades; grade point average; the specific number of hours/credits enrolled, passed, or failed; Social Security Number; student ID number; name of parents or next of kin; and/or residency status.

14. **Ethics and Sexual Harassment Policy:** Sexual harassment in any situation is reprehensible. It subverts the mission of the University, and threatens the careers of students, faculty, and staff. It is viewed as a violation of Title VII of the 1964 Civil Rights Act as amended by the 1991 Civil Rights Act. Sexual harassment will not be tolerated at KSU. KSU is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, religion, color, sex, national origin, disability, age, sexual orientation, or veteran

status. In adhering to this policy, the University abides by the requirements of Title IX of the Education Amendments of 1972; by Title VII of the Civil Rights Act of 1964, as amended by the Civil Rights Acts of 1991; by Sections 504 and 504 of Rehabilitation Act of 1973; by Executive Order 11246, as amended by 38 U.S.C. 2012; the Vietnam Era Veterans Readjustment Assistance Act of 1972, as amended; and by other applicable statutes and regulations relating to equality of opportunity. This policy on sexual harassment applies to the entire University and to the conduct of students, faculty, and staff alike.

15. **Student Rights and Responsibilities:** Students of KSU are entitled to an environment that is conducive to learning and individual growth. To this end, students enrolling at KSU assume a responsibility to abide by the policies and regulations expressed in this section. By doing so, students may fulfill their responsibilities and enjoy the exercise of their own rights while also respecting the rights of others. Information about the student rights and responsibilities can be found at http://catalog.kennesaw.edu/content.php?catoid=27&navoid=2263

16. **Academic Honesty/Integrity:** KSU has an academic honesty/integrity and a procedure for handling cases when academic misconduct is alleged. All students should be aware of them. Information about the academic honesty/integrity and the misconduct procedure can be found at https://web.kennesaw.edu/scai/content/ksu-student-code-conduct.

17. **ADA Provisions:** "Students with disabilities, as defined by the Americans with Disabilities Act (ADA) of 1990, should contact the instructor during the first week of the semester regarding the accommodations necessary to complete the requirements of this course. The instructor, with the help of KSU, will make reasonable adjustments to take into consideration the specific handicap of each student covered under the ADA." The students can also contact KSU Marietta Campus ADA coordinator at 678-915-7244 for additional help."

18. **Communications, Grading, and Response Timeframe:** The best way to communicate with me is by KSU email, then by telephone. Grading of homeworks/ assignments may take up to a week. I will try to respond to any discussions/ comments/ questions within 24 hours. However, I may not be available during the weekend or while I am in vacation or in official trip.

19. **Grade Dispute/Appeal:** Final grade dispute/appeal must be submitted within a week of the final exam. The procedure has been outlined in the KSU website that can be accessed via the link at http://www.kennesaw.edu/registrar/policies/grade_appeals.php.

20. **Contacts to get Help:**
    - D2L Brightspace Technical Support, go to https://d2lhelp.view.usg.edu/
    - or call 678-915-HELP(4357)
    - KSU Help Desk Phone Number: (678) 915-HELP(4357)

21. **Additional Resources**
    - Remote access to Library Resources http://www.kennesaw.edu/library/Dl/dl.html
    - You can find The USG Copyright Policy at http://www.usg.edu/copyright/
    - Other help for student success at http://sss.kennesaw.edu/
    - KSU CETL Thank a Teacher: http://cetl.kennesaw.edu/thank-a-teacher

GRADING POLICY: All exams, quizzes, and assignments must be completed satisfactorily in order to pass the course. The evaluation process described below is subject to change by the instructor. Changes will be announced in D2L as it is necessary.

Class Work:

1. Homework	- 10%
2. Quiz	- 20%
3. Discussions	- 05%
4. Midterm 1 Exam	- 20%
5. Midterm 2 Exam	- 20%
6. Final Exam	- 25%
TOTAL	**- 100%**

Total Grade:

Scale, Letter Grade, and GPA

90%	- 100%	A	4.0	(Excellent)
80%	- 90%	B	3.0	(Good)
70%	- 80%	C	2.0	(Satisfactory)
60%	- 70%	D	1.0	(Passing)
	< 60%	F	0.0	(Failure)
--	--	WF	0.0	(Withdrawn after deadline)

Please visit http://catalog.kennesaw.edu/content.php?catoid=24&navoid=2170 for detail grading policy.

SCHEDULE: **Two 110-minute classes** or 3-75 minute classes or 1-220 minutes class per week

TENTATIVE LECTURE TOPIC/OUTLINE: The following lecture topic/outline is subject to change by the instructor. Changes will be announced in the class.

Class/Week	Tentative Lecture Topic/Outline	Chapter
Week 1	**Topic 1: Introduction and Mass Balance** – definitions, introduction to environmental engineering issues, code of ethics, environmental systems overview, environmental legislation, regulations, environmental ethics, mass balance, and problem solving using mass balance equations.	Chapters 1 & 2 + Handouts
Week 2	**Topic 2: Water Supply -** elements of water supply systems such as source of supply, collections system, treatment system, distribution system, and planning of water supply system.	Handouts
Week 3 - 4	**Topic 3: Water Treatment –** water chemistry, physical, chemical, and biological treatment of water such as sedimentation, filtration, chlorination, coagulation, flocculation, and water softening.	Chapter 4 + Handouts
Week 4	**Midterm 1 Exam – Proctored Exam in class**	---
Week 5 - 7	**Topic 4: Water Pollution –** definition and uses of biochemical oxygen demand (BOD) and chemical oxygen demand (COD), determination of BOD rate constant (*k*), and development of dissolved oxygen (DO) sag curve using Streeter Phelps' equation for a stretch of stream/river.	Chapter 5 + Handouts

Class/Week	Tentative Lecture Topic/Outline	Chapter
Week 8 - 10	**Topic 5: Wastewater Treatment -** wastewater microbiology, characteristics of wastewater, physical, chemical and biological treatment of wastewater such as unit operations of pretreatment, primary treatment, unit processes of secondary treatment, tertiary/advanced treatment, disinfection, various options for wastewater disposal and reuse.	Chapter 6 + Handouts
Week 10	**Midterm 2 Exam – Proctored Exam in class**	---
Week 11 - 12	**Topic 6: Air Pollution –** introduction to air pollution, air pollution perspective, air pollution standards, effects of air pollutants, origin and fate of air pollutants, and air pollution control of stationary sources.	Chapter 7 + Handouts
Week 13 -14	**Topic 7: Solid Waste Management -** definition and types of solid waste from technical and regulatory points of view, characteristics of solid waste, generation rate of solid waste in different regions and climate, process for storage, collection, treatment, disposal procedures, and perspectives of solid waste, recycling and reuse of waste, and disposal of municipal solid waste (MSW) in landfills.	Chapter 9 + Handouts
Week 15	**Topic 8: Hazardous Waste Management -** definition of hazardous wastes from technical and regulatory points of view, introduction to resource conservation and recovery act (RCRA) and comprehensive environmental response, compensation, and liability act (CERCLA), identification of hazardous waste, hazardous waste exclusions and exemptions, types of hazardous waste: listed and characteristic hazardous wastes, mixture rule, hazardous waste recycling and universal wastes, hazardous waste generators, and transporters.	Chapter 10 + Handouts
Week 16	**Final Exam – Comprehensive Proctored Exam in class**	---

ABET CATEGORY:

Engineering science: 2 credit hours (67%)
Engineering design: 1 credit hour (33%)

IMPORTANT DATES:

Event	7-Week Session I	7-Week Session II	15-Week Session
First Day of Classes	August 17 (M)	October 13 (Tu)	**August 17 (M)**
Breaks / Holidays	September 5-7 (Sa - M)	November 23 - 29 (M – Su)	**September 5 - 7 (Sa – M)** **November 23 - 29 (M – Su)**
Last Day to Withdraw Without Academic Penalty	September 9 (W)	November 5 (Th)	**October 7 (W)**
Last Day of Classes	October 5 (M)	December 7 (M)	**December 7 (M)**
Final Exams	October 6 - 7 (Tu - W)	December 8 - 14 (Tu - M)	**December 8 - 14 (Tu - M)**
Final Grades Due	October 10 (Sa), 5:00pm	December 17 (Th), 5:00pm	**December 17 (Th), 5:00pm**
Graduation	**December 15 - 17 (Tu-Th): Kennesaw Campus**		