



## CE 4373 – Environmental Engineering Microbiology

### Instructor Details

**Instructor:** Dr. Amy Borello Gruss  
**Office:** L-158  
**Office Hrs:** T: 11 am – 2 pm  
W: 10 am – 12:30 pm  
**Office Phone:** 470-578-7262  
**Email Address:** agruss@kennesaw.edu

### Course Details

**Term:** Spring 2020  
**Classroom:** L-120  
**Time:** MWF 9:05 – 9:55 pm  
**Credit Hours:** 3-0-3 (Lecture-Lab-Total)  
**Prerequisites:** CE 3702

**COURSE DESCRIPTION:** This course is intended to provide fundamental knowledge about microorganisms in the natural and engineered environment and their role in the cycling of elements, both natural and anthropogenically introduced into the environment. The course focuses on understanding their role in the biodegradation of contaminant chemicals and the application of processes that take advantage of the microbiological biodegradation processes

**REQUIRED or ELECTIVE:** Required for EnvE program

**REQUIRED TEXT:** (1) **Brock Biology of Microorganisms.** Madigan, Martinko, Parker, 14<sup>th</sup> Edition (ISBN 10: 0-321-89739-0; ISBN 13: 978-0-321-89739-8)

(2) **NCEES: FE Reference Handbook.** This text can also be downloaded for FREE in the provided link: <http://ncees.org/exams/study-materials/download-fe-supplied-reference-handbook/> or on our courses D2L website.

**OTHER MATERIALS:** Handouts may be provided as needed. **Kennesaw email** and **GeorgiaView Desire 2 Learn (D2L)** systems will be used for messages and part of the content delivery. Students should access these sites on a daily basis. *Disclaimer: Please do NOT email me through D2L as I will not be checking these regularly. To contact me, please email me at my KSU email: agruss@kennesaw.edu.*

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

1. Explain various aspects of environmental microbiology.
2. Calculate microbial growth kinetics for bacterial growth and substrate degradation.
3. Interpret various metabolic pathways used by environmental microorganisms.
4. Describe the impacts of microorganism in public health and industry.
5. Demonstrate the use of microorganisms in various engineering applications.

## **COURSE REQUIREMENTS:**

1. **Homework:** All problem assignments must be submitted by the date assigned by the instructor.
  - A physical copy of the homework is due at the **START** of class on the due date.
  - Homework turned in one class period late will lose 25% of the possible score. Assignments **WILL NOT be accepted more than one class late** without prior instructor consent. 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.
  - All homework must be submitted on 8½"x11" white paper, engineering graph paper, or on the assigned printed worksheet.
  - Fold the assignment in half (the long way), and on the outside of the folded sheet write your (1) name, (2) course number, (3) assignment number (i.e, HW1, HW2...), and (4) date submitted.
  - If calculations are required, show all your work for full credit.
  - Box or Underline your answers. Illegible handwriting will not be graded.
  - Graded homework will be returned to students; however, students need to preserve them until the grades are finalized and show them to the instructor if there is any dispute in final grades.
  
2. **Exams/Quizzes:** All exams/quizzes are closed books and notes unless advised otherwise. However, **NCEES FE Handbook can be used** during the Exams and/or Quizzes. **NO make-up** exams/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. Graded exams/quizzes 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 final grades. Typically, quizzes will be in class the date assigned by the instructor; however, pop quiz may also be given from time to time.
  
3. **Attendance Policy:** Students are required to attend classes. Advance notice of an absence should be provided whenever possible. No points are assigned for attendance. The students are solely responsible for managing their enrollment status in this course. Nonattendance does not constitute a withdrawal from the course. Attendance is mandatory when we have guest speakers!
  
4. **Course Project:** Students will complete one course project by the end of the semester and present this project in class. The course project is individual and not a team effort. More information on the course project will be provided in class and on D2L Brightspace.
  
5. **Field Visits:** Students will be required to travel off campus when field/site visits are planned. Carpooling is preferred. If students are unable to attend due to extenuating circumstances, make-up work will be required.
  
6. **Communications, Grading, and Response Timeframe:** The best way to communicate with me is by KSU email. Please do not send emails through D2L as it will not be checked regularly. Grading of homeworks/assignments may take up to a week. I will try to respond emails **by the close of the following business day**. Expect to receive a response to emails sent on the weekend on the following Monday.

Do not expect to solve all problems via email! Taking advantage of office hours is the easiest and most effective way to answer questions. If you are unable to attend office hours, allow ample time to arrange a meeting, as I am not usually not immediately available outside of office hours.

7. **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.
8. **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.
9. **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.
10. **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>
11. **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/scail/content/ksu-student-code-conduct>.
12. **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.”  
[http://www.kennesaw.edu/stu\\_dev/dsss/policies.shtml](http://www.kennesaw.edu/stu_dev/dsss/policies.shtml).

13. **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](http://www.kennesaw.edu/registrar/policies/grade_appeals.php).
14. **Useful Resource:** "The KSU Writing Center helps students in all majors improve their writing. Experienced, friendly writing assistants help with topic development, revision, research, documentation, grammar, and more. For more information or to make an appointment, visit [writingcenter.kennesaw.edu](http://writingcenter.kennesaw.edu) or stop by English Building, Room 242 (Kennesaw campus) or Johnson Library, Room 121 (Marietta campus)."
15. **Contacts to get Help:**
  - D2L Technical Support, go to <https://d2lhelp.view.usg.edu/> or call 678-915-HELP
  - D2L Brightspace website at <https://kennesaw.view.usg.edu/d2l/login>
  - KSU Help Desk Phone Number: (678) 915-HELP (4357).
  - KSU Distance Learning at <http://distancelearning.kennesaw.edu/support/content-tools.php>
  - KSU UITS at <http://uits.kennesaw.edu/>
  - Accessibility policy of all technologies:  
<https://softchalkcloud.com/lesson/serve/jV10GKPfztZwQn/html>
16. **Additional Resources**
  - Remote access to Library Resources at <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/>
  - Academic support services and student services at <http://kennesaw.edu/currentstudents.php>
  - KSU CETL Thank a Teacher at <http://cctl.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 class.

<b><u>Class Grade Components:</u></b>		<b><u>Class Grading scale and letter grade</u></b>	
Homework	10%	>90.0	A
Quizzes	20%	89.9 – 80.0	B
Course Project	30%	79.9 – 70.0	C
Midterm Exam	20%	69.9 – 60.0	D
Final Exam	20%	<59.9	F
Total	100%	Withdrawal after deadline	WF

Please visit <http://catalog.kennesaw.edu/content.php?catoid=24&navoid=2170> for KSU’s detailed grading policy.

**SCHEDULE:** Three 50-minute classes

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

Class/Week	Tentative Lecture Topic/Outline	Chapter
Week 1	Topic 1: Classification of Microorganisms	1.1 – 1.5
Week 2 – 3 MLK Jr. Day	Topic 2: Bacteria, Viruses, Algae, Fungi and Protozoa Monday Jan. 20 <sup>th</sup> – No class	Handout
Week 4	Topic 3: Growth Kinetics	PowerPoints, TBD
Week 5	Topic 4: Soil and Solid Waste Microbiology, Insect and Rodent-borne Diseases	19.6 – 19.7, 30.1 – 30.7
Week 6	Topic 5: Atmospheric and Indoor Air Microbiology, Airborne Diseases	Handouts, 29.1 – 29.8
Week 7	Midterm Exam	---
Week 8 – 9	Topic 6: Pathogens, Sanitation, and Health	23.6 – 23.12
Week 10 – 12	Topic 7: Water and Wastewater Microbiology	21.6 – 21.9
Week 13	SPRING BREAK (March 30 <sup>th</sup> - April 3 <sup>rd</sup> ) – No class	--
Week 14	Topic 8: Waterborne Diseases and Water Quality	31.3 – 31.5
Week 15	Topic 9: Inorganic and Organic Contaminants	21.3 – 21.5
Week 16	Project Presentations	--
Week 17	Final Exam – In class, Monday, April 27 <sup>th</sup>	---