ABE 341: Transport Processes in ABE
Syllabus – Spring 2026

Instructor:	Kent Rausch	Lecture:	MWF 12:00 - 12:50 pm, room 208 AESB
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Office:	360b AESB	Credit:	3 hours (undergraduate)
Mailbox:	360k AESB	URL:	https://canvas.illinois.edu/courses/63940
Office hours:	Drop in anytime, as announced in class or by appointment	Note:	you can earn points by reading this syllabus and taking a short quiz ☺

Course Description and Objectives
Principles of transport processes involving momentum, heat, and mass as applied to biological systems in agriculture, food, energy, and the environment. This course applies fundamental principles to transport processes: momentum, heat, and mass as applied to biological processes found in agriculture, food, energy, and the environment. At the end of the course, students should be able to:

- identify, formulate, and solve heat, mass and momentum transport problems by applying principles of engineering, science and mathematics
- identify, formulate and analyze ethical decision options.

Course Prerequisites: credit is not given for both ABE 341 and ChBE 421. Prerequisites: ABE 227 and ABE 228 (or equivalent course preparation from other departments). If in doubt, contact the instructor.

Class Resources and Required Materials

- *Required Textbook:* Geankoplis, C.J. Transport Processes and Separation Process Principles. 4th ed. Prentice Hall. Upper Saddle River, NJ: Pearson Education, Inc. ISBN 0-13-101367-X. A 5th edition has been released. Problem numbers and chapters will not match the 4th edition, creating confusion and more work for you. The 4th ed should be available as a used text. This is an excellent text to use as a reference as you begin engineering practice.
- *Required Materials:* A method to take notes during class; engineering paper for homework, calculator, class notes (slides).
- Students are responsible for all assigned chapters in the required text as well as all handouts distributed via Canvas or in class.
- A method to annotate the numerous PDF files used in this class will be very helpful.
- Course materials will be distributed via Canvas. Lecture slides will be made available about 24 hours before lecture on Canvas as a PDF. Selected solutions, video modules and examples may also be provided.

Course Philosophy, Policies and Grading

Syllabus: The document you are now reading is the syllabus. I consider this as a fixed document that will not change during the semester. Think of the syllabus as rules of a game: it's not fair to change the rules during the game (unless there's overwhelming justification). Canvas also has a "Syllabus" link which lists course assignments.

Schedule: The course schedule is a separate document that will be updated and adjusted quite often. At the Canvas Syllabus link, be sure to verify due dates.

Lectures: Preparation for lecture will make lecture more effective for you. Check Canvas and skim the text materials and lecture slides before lecture. During lecture, my objective is to highlight slides and demonstrate these concepts through examples. Based on student feedback, examples make lecture more enjoyable and effective. Skimming materials before lecture will help you ask questions that facilitate doing homework and Quiz assignments.

Attendance: Why come to class? "Everything is in the text… or online video… or in the slides." And yet, attending course lectures are a

proven method to comprehend and retain key materials. Being present for class and taking notes is a proven way to learn course material. In fact, taking notes by hand, rather than typing, has been shown in clinical studies to improve learning and retention of course material over other methods. Regular and punctual attendance at all lectures is the responsibility of each student. With so much material covered in the course, lecture periods concisely illustrate key points and principles that must be learned for a good grade.

In the event that you find it unavoidable to be absent from a class, you are responsible to make up resulting deficiencies. For a definition of what constitutes excused vs. unexcused absences, please refer to Part 1, Section 5 of the Student Code. If you must be absent, please notify me by email at least 48 hours in advance.

Seeking individual help: I am happy to answer your questions during or after class as time allows. If we need a detailed discussion, we can set up a Zoom or in person meeting. If I am in my office, you are welcome to stop by and ask questions.

Course Grade: Canvas should allow students to check their scores, receive updates and download course materials. Discrepancies between assignment grades and those recorded in Canvas should be brought to my attention within 24 hours after the assignment is due. You should always attempt to do your best throughout the course. However, you should track your progress so that you know how you are doing. You are welcome to meet with me and discuss assignment grades. Assignments are graded based on a scale, not on a curve. Course grades will be based on the following percentages:

*Assessment***	*Portion of Grade*	*Course Points*	*Course Grading Scale*
Homework (13 @ 5 pt each)	5.9%	65	A- = 90.0-93.9%; A = 94.0-97.9%; A+ = 98.0-100%
Quizzes (12 @ 50 pt each)*	54.1%	600	B- = 80.0-83.9%; B = 84.0-86.9%; B+ = 87.0-89.9%
Ethics assignment	6.8%	75	C- = 70.0-73.9%; C = 74.0-76.9%; C+ = 77.0-79.9%
Participation activities (~ 14 @ 5 pt each)	6.3%	70	D+ = 67.0-69.9%
Final Exam (comprehensive)	27.0%	300	F = 59.0% and below
Total	100%	1110	

**Portion of Grade (%) is exact; Course Points are approximate and may change slightly.
*Lowest quiz score will be dropped.

Assignments

Your homework solutions are a form of communication. Clear and organized solutions usually receive partial credit. They convey professionalism, clarity of thought and lend credibility to your abilities and answers. In engineering practice, written reports and papers convey credibility. Quizzes are drawn from key concepts and homework problems; the final exam is drawn from quizzes, examples and homework.

Late assignments: In general, no late assignments will be accepted, but you should submit the assignment as close to the deadline as possible to avoid falling behind. In some cases, partial credit of 50% may be given if turned in within 24 hours of the due date.

Participation activities: typically following each lecture, a short set of questions will be posted in Canvas and must be completed by the due date. These activities reinforce key concepts discussed in lecture. Full credit is given for attempting each question, regardless of correctness. Answers are usually provided at the completion of each set of questions.

Homework: Diligence and persistence in homework is key to doing well in this course. Effort placed in attempting and

learning homework concepts will lead to better Quiz scores.

- The objective of each homework is to be able to solve engineering problems discussed in class, with plenty of time to figure them out (compared to a quiz). Solving problems directly affects your ability to work problems during a quiz when time is limited.
- Homework is given a completion grade, meaning you will receive full credit if you've honestly attempted each problem in the assignment.
- Homework is a "low stakes activity". Although a relatively small percentage of the semester grade, understanding homework has a large effect on your grade.
- Understanding problem solutions is a key responsibility. Homework should be completed but solutions also studied and problems practiced several times. Additionally, they should then be practiced at a rapid pace to prepare for quizzes and the final.
- Homework requirements for receiving credit:
    - All homework must be worked on engineering paper. 200 sheets are about the cost of two Starbucks visits. Purchase it online or a similar source: https://www.amazon.com/gp/product/B000Q5Z5UO/ref=ppx_yo_dt_b_asin_title_o04_s00?ie=UTF8&psc=1
    - Alternatively, you can submit homework solutions using digital technology that displays your handwriting, such as an iPad and the Notability app. There are other possibilities, but the solutions should be written by hand, not typed and have the appearance of a solution on engineering paper.
    - The solution must be attempted in an organized fashion using a Given summary, Find statement and Solution calculations.
    - For credit, each problem must be set up, solved and an answer clearly indicated.
    - Use the nongridded side of the engineering paper only.
    - Do not crowd your solutions. Use one page per problem, unless more than one solution will fit entirely on one page.
    - Your name, problem number and page number should be on each page.
    - *Neatness counts!* Unorganized, messy assignments will not receive as much consideration for credit as will organized ones. Illegible work will not receive credit.
    - Each homework scan should be legible. This may take some practice (and require time) with scanning apps.
    - Homework due dates and times will be given in the course schedule.
    - Homework must be submitted electronically in PDF format as a single file.
    - Do not use photos.
    - Research and practice using apps available for creating PDFs using your phone or tablet.
    - Plan ahead so that you have time to scan to a PDF and upload it into Canvas.
    - No late homework will be accepted.
- Homework will not be graded for absolute accuracy or analyzed to determine where mistakes occurred.
- Following each Homework due date, a solution will be posted so that you can evaluate your ability to solve each problem.
- Homework tips:
    - Manage your time. If you get stuck, outline your best attempt and submit the problems on time. Then follow up with the solution and ask questions in class.
    - It is okay to study in groups but be aware that you may not be learning how to work problems.
    - When the solution is posted, make sure you understand the solution.
    - Work problems again after they are due if you had difficulty.

- Seek one-on-one support before or after the due date as needed.

Equation Sheets: a packet of equations and tables will be provided and used during quiz and exam periods. Details for equation sheet use are:

- No pages/sheets may be added to the packet. Everyone is allowed the same paper surface area in the packet.
- Anything can be added to the equation sheets – this means anything, as long as it is in your handwriting. You should annotate as needed, including units used for equations.
- Equation sheet hardcopies are collected and inspected following quizzes and the final to ensure fairness and integrity.

Quizzes: The objective of each quiz is to test your understanding of lecture concepts and ability to work questions.

- Quizzes are paper based and serve as "dress rehearsals" for the final.
- Quizzes will be due at the end of class and graded fully. Partial credit is awarded as appropriate.
- Quizzes will be closed book and closed notes with equation sheets allowed.
- Problems are derived from homework and lecture concepts.
- There is no make-up for missing a quiz.

Ethics assignment: all engineers have a responsibility to society for performing their work properly. Recognizing ethical dilemmas and making ethical decisions is an important skill. We will discuss this in depth during the semester, then an assignment will be due at the end of the semester, worth the value of one quiz.

Final Exam: is comprehensive. There will be 3 hours for completion. Closed book, closed notes, with equation sheets allowed.

Assignment Return: quizzes will be returned as soon as possible. The final exam will not be returned. All grades will be posted on Canvas. In accordance with federal law (FERPA), we cannot use a publicly accessible pick-up box to return assignments or allow a classmate to pick them up for you. Quiz solutions will be posted shortly after the quiz period (usually within 48 hours).

Response times: *Quizzes* are hand graded and therefore may take about a week to be returned. Solution notes for each quiz will be posted about 1 day after it has been taken; these can be used immediately to improve learning. *Homework* solutions are posted immediately after the due date. *Responding to emails and phone calls:* You should not hesitate to send questions via email regardless of the time or day. I will answer questions via email or by a one-on-one appointment. I will do my best to respond to any message within 1 business day using email, even if you phone me. If you email me after about 4:30 pm, I may not be available to respond in time for a quiz the following day. Questions sent late on a Friday or during the weekend/holiday may not get a response until the following Monday.

Computer crash policy: *All* computers, networks and other systems have temporary glitches and failures, or worse. Bandwidth for file transmission may suddenly decrease or wi-fi networks may stop working. This is not an excuse for turning in an assignment late. When uploading files for an assignment, allow sufficient time in the event that problems occur.

Absence Policy: Class attendance is critical to doing well in this course. If you are unable to attend lecture or take a quiz, notify me in advance as soon as possible. Some absences are understandable (e.g., job interview, professional conference) if you let me know in advance. Unexplained absences will be documented. Missing lecture usually leads to more work for you, the student, regardless of the reason. If you will be ill more than 3 days of class you should obtain an absence letter. More information can be found from the Student Code: https://studentcode.illinois.edu/article1/part5/1-501/ .

Academic Integrity: Behavior in the classroom sets the pattern for ethical behavior in engineering practice. As an engineer, you will enter one of the most highly respected professions in our society. The University of Illinois *Student Code* is

considered a part of this syllabus. Students should pay particular attention to Article 1, Part 4: Academic Integrity. Read the Code at: http://studentcode.illinois.edu/. Academic dishonesty may result in a failing grade. Every student is expected to review and abide by the Academic Integrity Policy. Ignorance is not an excuse for any academic dishonesty. It is your responsibility to read this policy to avoid any misunderstanding. Do not hesitate to ask me if you are in doubt about what constitutes plagiarism, cheating, or any other breach of academic integrity.

1. If a conflict assignment has been arranged, it is unethical to view and study an online solution prior to taking the conflict assignment. It is also unethical to discuss the assignment with others that have taken the assignment.
2. In the case of a take-home assignment, there should be absolutely no discussion of any aspect of the assignment with your classmates or peers before the due date.

Students with Disabilities: To ensure disability-related concerns are addressed properly from the beginning, students with disabilities who require assistance to participate in this class should contact me as well as the Disability Resources and Educational Services (DRES) during the first few days of the semester. You should send me your DRES-approved Letter of Accommodation immediately. If you need accommodations for any sort of disability, please speak to me after class, or make an appointment. DRES provides students with academic accommodations, access and support services. Contact DRES: 333-4603, or send an e-mail to disability@uiuc.edu, http://www.disability.illinois.edu/.

Emergency Response Recommendations can be found at the following website: http://police.illinois.edu/emergency/. Please review floorplans and exits of this building within the first few days on campus. Run, Hide, Fight summary, specific to room 208: For severe weather, we should move down the north staircase to the lower level, away from windows. For a fire alarm, exit via the nearest stairs and doorway. For a violent situation/shooter situation, the first choice is to run unless it is unsafe to do so. We may hide in place in room 208.

Family Educational Rights and Privacy Act (FERPA): Any student who has suppressed their directory information pursuant to *Family Educational Rights and Privacy Act* (FERPA) should self-identify to the instructor to ensure protection of the privacy of their attendance in this course. See http://registrar.illinois.edu/ferpa for more information. The most apparent impact of FERPA is that grades and graded assignments cannot be made public; therefore, I must return assignments to you directly.

Inclusiveness Statement: The effectiveness of this course is dependent upon the creation of an encouraging and safe classroom environment. Exclusionary, offensive or harmful speech (such as antisemitism, racism, sexism, homophobia, transphobia, etc.) will not be tolerated and in some cases subject to University harassment procedures. We are all responsible for creating a positive and safe environment that allows everyone equal respect. I expect each of you to help establish and maintain an environment where you and your peers can contribute without fear of ridicule or intolerant or offensive language (adapted from Professor Robyn Deterding, AHS).

Sexual Misconduct Policy and Reporting: The University of Illinois is committed to combatting sexual misconduct. Faculty and staff members are **required** to report any alleged instances of sexual misconduct to the University's Title IX and Disability Office. In turn, an individual with the Title IX and Disability Office will provide information about rights and options, including accommodations, support services, the campus disciplinary process, and law enforcement options. A list of the designated University employees who, as counselors, confidential advisors, and medical professionals, do not have this reporting responsibility and can maintain

confidentiality, can be found here: wecare.illinois.edu/resources/students/#confidential. Other information about resources and reporting is available here: wecare.illinois.edu.

Bias and Inclusivity: The effectiveness of this course is dependent upon each of us to create a safe and encouraging learning environment that allows for open exchange of ideas while also ensuring equitable opportunities and respect for all. Everyone is expected to help establish and maintain an environment where students, staff, and faculty can contribute without fear of personal ridicule, or intolerant or offensive language. If you witness or experience racism, discrimination, or other offensive behavior, you are encouraged to bring this to the attention of the course director if you feel comfortable. You can also report these behaviors to the Bias Assessment and Response Team (BART) (https://bart.illinois.edu/). Based on your report, BART members will follow up and reach out to students to make sure they have the support they need to be healthy and safe. If the reported behavior also violates university policy, staff in the Office for Student Conflict Resolution may respond as well and will take appropriate action.