

MME 3306: Rate Processes

CRN: 24110

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Office Hours: In person M201J: Tues 9:30-11am, Fri 9:30-11am

Course Information:

COURSE DESCRIPTION

MME 3306 will cover the processes that control materials production systems and modification of material properties for specific applications. The separation processes involved in industrial and research applications are based on mass transport, momentum transport, and heat transport. The basis of these fundamentals will be covered for material balance, chemical kinetics, fluid flow, and heat transfer. The material will be covered from an introductory viewpoint. An in-depth study can be obtained by taking advanced courses as technical electives in junior and senior years.

Students enrolled in MME 3306 should have successfully completed ENGR 1401, CHEM 1306, and MATH 2326 or MATH 3326.

COURSE OBJECTIVES OR EXPECTED LEARNING OUTCOMES

At the end of this course, students will be able to:

- Demonstrate the principles of material balance
- Model reactions kinetics in materials production and materials processing
- Solve fluid flow and heat transfer rate problems in materials production and processing
- Design simple production workflows for materials processing

LEARNING MODULES

This course is designed into 3 modules – Chemical Kinetics, Fluid Statics and Dynamics, and Heat Transfer.

REQUIRED MATERIALS

There is no required textbook for this course. Lecture notes will be supplied as each topic is covered. The following textbooks are recommended for students to use as a reference.

- Transport Process and Unit Operations – Christine J. Geankoplis
- Fundamentals of Momentum, Heat, and Mass Transfer – James R. Welty, Charles E. Wicks, Robert E. Wilson, Gregory Rorrer

COURSE ASSIGNMENTS AND GRADING

Homework: Regular problem sets will be used to reinforce the concepts and techniques covered in the lecture notes and class. All problem sets will be graded and will count as 30% of your final grade. Problem set solutions should be neat and follow the format to be outlined in class. Problem sets are due at the beginning of the class period one week after it is assigned unless other instructions are given. Problem sets are to be turned in before class starts. It should be stapled and flat (do not fold). Late work will only be accepted in the event of illness or an emergency and must be approved by the instructor.

Tests: There will be three midterm tests and a final examination. One makeup test will be given on Dead Day, 5/3/2024 from 9:30am – 11am. This makeup test will cover the entire course. You will only be allowed to take the makeup test if you have a valid, documented excuse for missing a previous test. The University does not allow makeup final exams. I will drop the lowest mark among your 3 midterm tests, with the remaining 2 midterms worth 20% of your final grade each.

Grading policy: There will be no curving of grades in this course. Your grade will be determined by problem sets (30%), top 2 marks of the 3 tests (20% each, for a combined 40%), and final examination (30%). If you score higher on the final examination than your final term grade, your final grade will be the score on your final examination. Final assigned letter grades will be determined using the 100 point final grade scale below as indicated:

Letter grade	Final grade	Meaning
A	85 – 100	Excellent
B	75 – 84	Good
C	65 – 74	Average
D	50 – 64	Below average
F	< 50	Unsatisfactory

TECHNOLOGY REQUIREMENTS

Course content is delivered via the Internet through the Blackboard learning management system. Ensure your UTEP e-mail account is working and that you have access to the Web and a stable web browser. Google Chrome and Mozilla Firefox are the best browsers for Blackboard; other browsers may cause complications. When having technical difficulties, update your browser, clear your cache, or try switching to another browser.

You will need to have access to a computer/laptop. You will need to download or update the following software: Microsoft Office, and Adobe Acrobat Reader. Check that your computer hardware and software are up-to-date and able to access all parts of the course.

If you do not have a word-processing software, you can download Word and other Microsoft Office programs (including Excel, PowerPoint, Outlook and more) for free via UTEP's Microsoft

Office Portal. Click the following link for more information about [Microsoft Office 365](#) and follow the instructions.

IMPORTANT: If you encounter technical difficulties beyond your scope of troubleshooting, please contact the UTEP [Help Desk](#) as they are trained specifically in assisting with technological needs of students. Please do not contact me for this type of assistance. The Help Desk is much better equipped than I am to assist you!

Course Communication:

There are a number of ways we can keep the communication channels open:

- **Office Hours:** I will be available in my office in Metallurgy Building, Room M201J for office hours in-person. You may request alternative times or virtual office hours by appointment and dependent on my availability. Scheduled office hours will take place at the following times (excluding holidays or otherwise notified in class or on Blackboard):
Tues 9:30-11am, Fri 9:30-11am
- **Email:** UTEP e-mail is the best way to contact me. I will make every attempt to respond to your e-mail within 24-48 hours of receipt. When e-mailing me, be sure to email from your UTEP student account and please put the course number in the subject line. In the body of your e-mail, clearly state your question. At the end of your e-mail, be sure to put your first and last name, and your university identification number.
- **Discussion Board:** If you have a question that you believe other students may also have, please post it in the Help Board of the discussion boards inside of Blackboard. Please respond to other students' questions if you have a helpful response.
- **Announcements:** Check the Blackboard announcements frequently for any updates, deadlines, or other important messages.

NETIQUETTE

As we know, sometimes communication online can be challenging. It's possible to miscommunicate what we mean or to misunderstand what our classmates mean given the lack of body language and immediate feedback. Therefore, please keep these netiquette (network etiquette) guidelines in mind. Failure to observe them may result in disciplinary action.

- Respect and courtesy must be provided to classmates and to the instructor at all times. No harassment or inappropriate postings will be tolerated.
- Blackboard is not a public internet venue; all postings to it should be considered private and confidential. Whatever is posted on in these online spaces is intended for classmates and professor only. Please do not copy documents and paste them to a publicly accessible website, blog, or other space.

Course Policies:

ATTENDANCE AND PARTICIPATION

There is no mandatory attendance policy. However, the importance of attending every class cannot be over emphasized. When you miss a class, you will need to put in extra time outside of class to completely make up for what you missed in class. Copying someone's class notes is not sufficient to make up what was missed in class. This is especially true for this course as there is no assigned textbook.

EXCUSED ABSENCES AND/OR COURSE DROP POLICY

According to UTEP Curriculum and Classroom Policies, “When, in the judgment of the instructor, a student has been absent to such a degree as to impair his or her status relative to credit for the course, the instructor may drop the student from the class with a grade of “W” before the course drop deadline and with a grade of “F” after the course drop deadline.” See academic regulations in the UTEP Undergraduate Catalog for a list of excuse absences. Therefore, if I find that, due to non-performance in the course, you are at risk of failing, I will drop you from the course. I will provide 24 hours advance notice via email. However, if you feel that you are unable to complete the course successfully, please let me know and then contact the [Registrar’s Office](#) to initiate the drop process. If you do not, you are at risk of receiving an “F” for the course.

DEADLINES, LATE WORK, AND ABSENCE POLICY

Problem sets

- Problem sets are due at the beginning of the class period a week after it is assigned unless other instructions are given. Problem sets are to be turned in before class starts. It should be stapled and flat (do not fold). Late work will only be accepted in the event of illness or an emergency and must be approved by the instructor. Late work will be subject to a 30% mark penalty.

Midterm tests

- One makeup midterm test will be given on Dead Day, 5/3/2024 from 9am – 10:30am. This makeup test will cover the entire course. You will only be allowed to take the makeup test if you have a valid, documented excuse for missing a previous test. You cannot make up more than one missed midterm test.

MAKE-UP WORK

Make-up work will be given *only* in the case of a *documented* emergency. Note that make-up work may be in a different format than the original work, may require more intensive preparation, and may be graded with penalty points. If you miss an assignment and the reason is not considered excusable, you will receive a zero. It is therefore important to reach out to me—in advance if at all possible—and explain with proper documentation why you missed a given course requirement. Once a deadline has been established for make-up work, no further extensions or exceptions will be granted.

ACCOMMODATIONS POLICY

The University is committed to providing reasonable accommodations and auxiliary services to students, staff, faculty, job applicants, applicants for admissions, and other beneficiaries of University programs, services and activities with documented disabilities in order to provide them with equal opportunities to participate in programs, services, and activities in compliance with sections 503 and 504 of the Rehabilitation Act of 1973, as amended, and the Americans with Disabilities Act (ADA) of 1990 and the Americans with Disabilities Act Amendments Act (ADAAA) of 2008. Reasonable accommodations will be made unless it is determined that doing so would cause undue hardship on the University. Students requesting an accommodation based on a disability must register with the [UTEP Center for Accommodations and Support Services](#) (CASS). Contact the Center for Accommodations and Support Services at 915-747-

5148, or email them at cass@utep.edu, or apply for accommodations online via the [CASS portal](#).

SCHOLASTIC INTEGRITY

Academic dishonesty is prohibited and is considered a violation of the UTEP Handbook of Operating Procedures. It includes, but is not limited to, cheating, plagiarism, and collusion. Cheating may involve copying from or providing information to another student, possessing unauthorized materials during a test, or falsifying research data on laboratory reports. Plagiarism occurs when someone intentionally or knowingly represents the words or ideas of another as one's own. Collusion involves collaborating with another person to commit any academically dishonest act. Any act of academic dishonesty attempted by a UTEP student is unacceptable and will not be tolerated. All suspected violations of academic integrity at The University of Texas at El Paso must be reported to the [Office of Student Conduct and Conflict Resolution \(OSCCR\)](#) for possible disciplinary action. To learn more, please visit [HOOP: Student Conduct and Discipline](#).

COPYRIGHT STATEMENT FOR COURSE MATERIALS

All materials used in this course are protected by copyright law. The course materials are only for the use of students currently enrolled in this course and only for the purpose of this course. They may not be further disseminated.

Course Resources: Where you can go for assistance

UTEP provides a variety of student services and support:

Technology Resources

- [Help Desk](#): Students experiencing technological challenges (email, Blackboard, software, etc.) can submit a ticket to the UTEP Helpdesk for assistance. Contact the Helpdesk via phone, email, chat, website, or in person if on campus.

Academic Resources

- [UTEP Library](#): Access a wide range of resources including online, full-text access to thousands of journals and eBooks plus reference service and librarian assistance for enrolled students.
- [Math Tutoring Center \(MaRCS\)](#): Ask a tutor for help and explore other available math resources.

Individual Resources

- [Military Student Success Center](#): Assists personnel in any branch of service to reach their educational goals.
- [Center for Accommodations and Support Services](#): Assists students with ADA-related accommodations for coursework, housing, and internships.
- [Counseling and Psychological Services](#): Provides a variety of counseling services including individual, couples, and group sessions as well as career and disability assessments.