

MEMORANDUM FOR STUDENTS ENROLLED IN CHEN 3340 – Section 01

SUBJECT: CHEN 3340 Heat Transfer- Administrative Instructions

Lecture times: Tu/Th, 9:30 am – 10:50 am

Location: RBN 2007

Instructor: Zishu Cao

Office: RBN 3013

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Welcome to 3340 Heat Transfer. This course will introduce the fundamentals and applications of various modes of heat transfer, i.e., conduction, convection, and radiation. Analysis of practical heat transfer processes will be conducted employing analytical methods and numerical techniques. Upon completion of this course, students will be able to apply the simple theory of steady-state heat conduction, external and internal flow convection to engineering applications and understand the design and principles of important types of heat exchangers.

Course Objectives:

1. Understand the three primary modes of heat transfer: conduction, convection and radiation.
2. Apply the conservation of energy to basic heat transfer analysis.
3. Apply the heat conduction equation in one-dimensional and two-dimensional situations.
4. Understand the boundary-layer flow and heat transfer
5. Apply convective heat transfer correlations to external and internal flows.
6. Use energy balances combined with heat transfer and heat transfer coefficients to analyze and design heat exchangers.

Mode of delivery: This is a face-to-face course. Course assignments, such as homeworks and open-ended projects, will always be submitted online via Canvas.

1. The course has two prerequisites which must be completed successfully prior to taking this course:
 - ✓ CHEN 3301 (Thermodynamics)
 - ✓ CHEN 3310 (Fluid Mechanics)
2. The goal of our faculty is to be commonly available to you for assistance, so you are encouraged and expected to seek **additional instruction (AI)**. Take advantage of AI, it's FREE and really will help! There are several ways you can seek AI:
 - ✓ You are welcome to stop by the instructor's office at any time. However, for your own satisfaction, you can ensure the instructor is available at the office by using the following options:
 - ✓ Come to Office hours (**Tuesdays and Thursdays from 12:30 pm - 2:00 pm**). This is the time the instructor has set aside to answer your questions,
 - ✓ E-mail the instructor to set up a mutually agreeable time to meet with the instructor,
 - ✓ E-mail your questions to the instructor (this is the least preferred option because of the limited effectiveness of e-mail communication), but it is acceptable if other options are not possible.
3. Classroom Procedures:
 - a. Please bring textbooks, calculators, and other learning devices to every class. If you have an ebook or e-copy of a book, you are welcome to bring your laptops/tablets. Please read the relevant assigned reading materials in the book. Attendance is highly encouraged, and it will help you to get high final grade. You will not be able to share calculators during exams or quizzes. Class preparation is your individual responsibility.
 - b. *Textbooks:*
Theodore L. Bergman, Adrienne S. Lavine, Fundamentals of Heat and Mass Transfer, 8th Edition (Wiley).

c. *Recitations:*

A portion of certain lectures will be used for recitation sessions. These will be the students' opportunity to practice problem-solving skills applying the concepts learned in lectures. These skills will be needed for solving homework, quizzes and exam problems. Please bring your textbook for the recitation sessions.

4. Evaluations:

a. *ACADEMIC DISHONESTY:* Representation of other's work as your own will not be tolerated. Cheating on examinations, quizzes, and homework and the false representation of work will be interpreted as academic dishonesty. Academic dishonesty will be subject to disciplinary action as outlined by the UT Tyler Student Guide on Conduct and Discipline.

b. *Homeworks:* A set of homework problems will be assigned approximately every two weeks (check Canvas for the due dates). All homework is mandatory and becomes part of your grade. As an engineer your goal is to make a clear, logical, and professional presentation of your work, which is both accurate and correct. As such, both the presentation and the accuracy of your work is important, and both will be graded. It is critical that you show all of your work and leave "foot prints" so that it can be easily followed. You are encouraged to work in groups, but the work that you turn in should be your own. Homework assignments are **due** on Canvas.

c. *Late submissions:* It is a basic principle of professionalism that **"Professionals are not Late."** A "COORDINATED LATE" submission occurs when you will miss the due date for a graded assignment and you contact me in advance. Notification immediately before the submission will not suffice. Point cuts up to the amounts below **may** be assessed for a "COORDINATED LATE" submission:

- | | |
|----------------------------|--|
| 1. 0-24 hours late | a deduction of 25% of the earned grade |
| 2. 24-48 hours late | a deduction of 50% of the earned grade |
| 3. More than 48 hours late | No credit. |

Obviously, there are circumstances that will occur and make a timely submission impossible, and I will work with you when and if they occur.

All homework on this course must be properly documented. As you are having your work reviewed it is likely that you might receive help from your classmates, just simply document it. Information from the course textbooks (equations and outlines of procedures), class notes, or me is considered immediately available to all students and need not be acknowledged or documented with one exception. **YOU ARE REQUIRED TO ACKNOWLEDGE AND DOCUMENT ALL OTHER ASSISTANCE AND REFERENCES USED.**

d. *Quizzes:* There will be four quizzes during the semester, scheduled dates will be announced on Canvas at least one week in advance. The quizzes will include problems similar to lecture examples and previous homework assignments. For grading, the highest three quiz scores will count toward the final grade, while the lowest score will be dropped.

e. *Participation grade:* Students are expected to be engaged in class and outside of the class. The instructor will assign a participation grade to each student based on the following observations:

- 1) Attendance in class and punctuality;
- 2) Level of participation in class.

f. *Mid-Term Exams and Final Exam:* There will be two Midterm Exams and one Final exam. The Midterms will be one hour and twenty minutes and the Final will be two hours long. The scheduled dates will be announced on Canvas at least one week in advance. Official reasons for missing an exam are outlined in the "Student Handbook". Report any conflict to me as soon as possible prior to the Exam. You can use a **TI-30 calculator** (or FE equivalent), and **you can bring one sheet with equations** for each Exam.

g. *Project:* At some point in the semester, students will be required to work on an assigned project. More details and requirements will be posted through Canvas. The project will be graded based on the report and oral

presentation. You are encouraged to work in groups. Only one report from each group is necessary. The contribution from each student should be clearly mentioned in the project report. Each student is required to present some portion in the oral project presentation.

5. Grading:

Grades will be based entirely on the student's demonstrated ability to develop detailed, neat, organized, and correct solutions to the problems presented. Correct answers accompanied by incorrect, incomplete, or untidy solutions may receive no credit.

Course Points

| | |
|------------------------------------|----|
| Quizzes (3 at 7 points each) | 21 |
| Homeworks (6 at 2 points each) | 12 |
| Participation (1 at 4 points) | 4 |
| Project (1 at 6 points) | 6 |
| Midterm Exams (2 at 17 points) | 34 |
| Final Examination (1 at 23 points) | 23 |

Total 100 (100%)

Grade Scale based on points

| | |
|--------------------------|---|
| Higher than 85 points | A |
| Between 72 and 85 points | B |
| Between 60 and 72 points | C |
| Between 30 and 60 points | D |
| Less than 30 points | F |

You need at least 60 points total to pass the course with a C grade.

6. Collection of Student Work:

Throughout the semester I will collect student work (best, average, and worst) for the ABET course and outcomes notebooks. This will require me to make a copy of your work, keep your original and return a copy of the graded work to you. I will not draw attention as to what level of work you accomplished.

7. Assigned readings:

The class schedule will include assigned reading for every lecture. Students who read the corresponding sections of the book *before each class* will certainly make the most of the lectures, so this is highly recommended. In addition, the instructor will periodically post the lecture notes on the course website. Doing the assigned reading prior to class will help you to understand the material presented during the instruction and will fill in gaps for things we do not cover (***I will not cover everything***). It will also make you more familiar with terms and concepts to be covered.

8. **UT Tyler Honor Code** - Every member of the UT Tyler community joins together to embrace: Honor and integrity that will not allow me to lie, cheat, or steal, nor to accept the actions of those who do.

9. **Students Rights and Responsibilities:** to know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link: <http://www.uttyler.edu/wellness/rightsresponsibilities.php>.

10. **Campus Carry** - We respect the right and privacy of students 21 and over who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. More information is available at <http://www.uttyler.edu/about/campus-carry/index.php>.

11. **UT Tyler a Tobacco-Free University** - All forms of tobacco will not be permitted on the UT Tyler main campus, branch campuses, and any property owned by UT Tyler. This applies to all members of the University community, including students, faculty, staff, University affiliates, contractors, and visitors. Forms of tobacco not permitted

include cigarettes, cigars, pipes, water pipes (hookah), bidis, kreteks, electronic cigarettes, smokeless tobacco, snuff, chewing tobacco, and all other tobacco products. There are several cessation programs available to students looking to quit smoking, including counseling, quitlines, and group support. For more information on cessation programs please visit www.uttyler.edu/tobacco-free.

12. Grade Replacement/Forgiveness and Census Date Policies - Students repeating a course for grade forgiveness (grade replacement) must file a Grade Replacement Contract with the Enrollment Services Center (ADM 230) on or before the Census Date of the semester in which the course will be repeated. Grade Replacement Contracts are available in the Enrollment Services Center or at <http://www.uttyler.edu/registrar>. Each semester's Census Date can be found on the Contract itself, on the Academic Calendar, or in the information pamphlets published each semester by the Office of the Registrar. Failure to file a Grade Replacement Contract will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates are eligible to exercise grade replacement for only three course repeats during their career at UT Tyler; graduates are eligible for two grade replacements. Full policy details are printed on each Grade Replacement Contract. The Census Date is the deadline for many forms and enrollment actions of which students need to be aware. These include:

- Submitting Grade Replacement Contracts, Transient Forms, requests to withhold directory information, approvals for taking courses as Audit, Pass/Fail or Credit/No Credit.
- Receiving 100% refunds for partial withdrawals. (There is no refund for these after the Census Date)
- Schedule adjustments (section changes, adding a new class, dropping without a "W" grade)
- Being reinstated or re-enrolled in classes after being dropped for non-payment
- Completing the process for tuition exemptions or waivers through Financial Aid

13. State-Mandated Course Drop Policy - Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped after the census date (See Academic Calendar for the specific date). Exceptions to the 6-drop rule may be found in the catalog. Petitions for exemptions must be submitted to the Enrollment Services Center and must be accompanied by documentation of the extenuating circumstance. Please contact the Enrollment Services Center if you have any questions.

14. Disability/Accessibility Services - In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA) the University of Texas at Tyler offers accommodations to students with learning, physical and/or psychological disabilities. If you have a disability, including a non-visible diagnosis such as a learning disorder, chronic illness, TBI, PTSD, ADHD, or you have a history of modifications or accommodations in a previous educational environment, you are encouraged to visit <https://hood.accessiblelearning.com/UTTyler> and fill out the New Student application. The Student Accessibility and Resources (SAR) office will contact you when your application has been submitted and an appointment with Cynthia Lowery, Assistant Director of Student Services/ADA Coordinator. For more information, including filling out an application for services, please visit the SAR webpage at <http://www.uttyler.edu/disabilityservices>, the SAR office located in the University Center, # 3150 or call 903.566.7079.

15. Student Absence due to Religious Observance - Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class meeting of the semester.

16. Student Absence for University-Sponsored Events and Activities - Revised 05/19 If you intend to be absent for a university-sponsored event or activity, you (or the event sponsor) must notify the instructor at least two weeks prior to the date of the planned absence. At that time the instructor will set a date and time when make-up assignments will be completed.

17. Social Security and FERPA Statement - It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.

18. Emergency Exits and Evacuation - Everyone is required to exit the building when a fire alarm goes off. Follow your instructor's directions regarding the appropriate exit. If you require assistance during an evacuation, inform your instructor in the first week of class. Do not re-enter the building unless given permission by University Police, Fire department, or Fire Prevention Services.

19. Student Standards of Academic Conduct - Disciplinary proceedings may be initiated against any student who engages in scholastic dishonesty, including, but not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

i. "Cheating" includes, but is not limited to:

- copying from another student's test paper;
- using, during a test, materials not authorized by the person giving the test;
- failure to comply with instructions given by the person administering the test;
- possession during a test of materials which are not authorized by the person giving the test, such as class notes or specifically designed "crib notes". The presence of textbooks constitutes a violation if they have been specifically prohibited by the person administering the test;
- using, buying, stealing, transporting, or soliciting in whole or part the contents of an unadministered test, test key, homework solution, or computer program;
- collaborating with or seeking aid from another student during a test or other assignment without authority;
- discussing the contents of an examination with another student who will take the examination;
- divulging the contents of an examination, for the purpose of preserving questions for use by another, when the instructors has designated that the examination is not to be removed from the examination room or not to be returned or to be kept by the student;
- substituting for another person, or permitting another person to substitute for oneself to take a course, a test, or any course-related assignment;
- paying or offering money or other valuable thing to, or coercing another person to obtain an unadministered test, test key, homework solution, or computer program or information about an unadministered test, test key, home solution or computer program;
- falsifying research data, laboratory reports, and/or other academic work offered for credit;
- taking, keeping, misplacing, or damaging the property of The University of Texas at Tyler, or of another, if the student knows or reasonably should know that an unfair academic advantage would be gained by such conduct; and
- misrepresenting facts, including providing false grades or resumes, for the purpose of obtaining an academic or financial benefit or injuring another student academically or financially.

ii. "Plagiarism" includes, but is not limited to, the appropriation, buying, receiving as a gift, or obtaining by any means another's work and the submission of it as one's own academic work offered for credit.

iii. "Collusion" includes, but is not limited to, the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any section of the rules on scholastic dishonesty.

iv. All written work that is submitted will be subject to review by plagiarism software.

20. Artificial Intelligence (AI) Language for Syllabi

UT Tyler is committed to exploring and using generative AI tools as appropriate for the discipline and task undertaken. We encourage discussing generative AI tools' ethical, societal, philosophical, and disciplinary implications. All uses of generative AI should be acknowledged as this aligns with our commitment to honor and integrity, as noted in UT Tyler's Honor Code. Faculty and students must not use protected information, data, or copyrighted materials when using any generative AI tool. Additionally, users should be aware that generative AI tools rely on predictive models to gen-erate content that may appear correct but shown sometimes to be incomplete, inaccurate, taken without attribution from other sources, and/or biased. Consequently, an AI tool should not be con-sidered a substitute for traditional approaches to research. You are ultimately responsible for the quality and content of the information you submit.

In this class, Generative AI is not permitted in this course at all. To best support your learning, you must complete all graded assignments by yourself to assist in your learning. This exclusion of other resources to help

complete assignments includes generative artificial intelligence (AI). Refrain from using AI tools to generate any course context (e.g., text, video, audio, images, code, etc.) for an assignment or classroom assignment.

21. UT Tyler Resources for Students

- UT Tyler Writing Center (903.565.5995), writingcenter@uttyler.edu
- UT Tyler Tutoring Center (903.565.5964), tutoring@uttyler.edu
- The Mathematics Learning Center, RBN 4021, this is the open access computer lab for math students, with tutors on duty to assist students who are enrolled in early-career courses.
- UT Tyler Counseling Center (903.566.7254)

Tentative Class Schedule

| Week | | Date | Material | Assigned Reading | Evaluation due |
|------|----|----------|--|------------------|----------------|
| 1 | Tu | Jan 13 | Syllabus, Transport Phenomena, Heat Transport | 1.1, 1.2 | |
| | Th | Jan 15 | Heat Transfer Rates, Relationship to Thermodynamics | 1.3-1.6 | |
| 2 | Tu | Jan 20 | Recitation 1 | | |
| | Th | Jan 22 | Introduction to conduction | 2.1, 2.2 | HW 1 |
| 3 | Tu | Jan 27 | The Heat Diffusion Equation | 2.3, 2.4 | |
| | Th | Jan 29 | The Plane Wall, Recitation 2 | 3.1 | Quiz 1 |
| 4 | Tu | Feb 3 | Thermal Resistance, An Alternative Conduction Analysis | 3.2 | |
| | Th | Feb 5 | Conduction in Radial Systems | 3.3 | |
| 5 | Tu | Feb 10 | Conduction with Thermal Energy Generation | 3.5 | |
| | Th | Feb 12 | Recitation 3 | | HW 2 |
| 6 | Tu | Feb 17 | 2-D Conduction | 4.2 | |
| | Th | Feb 19 | Conduction Shape Factor | 4.3 | |
| 7 | Tu | Feb 24 | Finite Difference Equations | 4.4 | |
| | Th | Feb 26 | Solving Finite Difference Equations | 4.5 | HW 3, |
| 8 | Tu | March 3 | Convection : The boundary layers, Local and Average Convection Coefficients | 6.1, 6.2 | Quiz 2 |
| | Th | March 5 | Laminar and Turbulent Flow, The Boundary Layer Equations, Boundary Layer Analogies | 6.3- 6.7 | Midterm 1 |
| 9 | Tu | March 10 | <i>No class -spring break</i> | | |
| | Th | March 12 | <i>No class -spring break</i> | | |
| 10 | Tu | March 17 | External Flow: The Empirical Method, The Flat Plate in Parallel Flow | 7.1, 7.2 | |
| | Th | March 19 | Methodology for a Convection, Cylinder in Cross Flow | 7.3, 7.4 | |
| 11 | Tu | March 24 | Cylinder in Cross Flow | 7.4 | HW 4 |
| | Th | March 26 | Internal Flow: Hydrodynamic Considerations ,Thermal Considerations | 8.1,8.2 | Quiz 3 |
| 12 | Tu | March 31 | The Energy Balance – Laminar Flow in Circular tubes | 8.3, 8.4 | |
| | Th | April 2 | Convection Correlations | 8.5, 8.6 | |
| 13 | Tu | April 7 | Recitation 4 | | HW 5 |
| | Th | April 9 | | | Midterm 2 |
| 14 | Tu | April 14 | Heat Exchanger Types, Overall Heat Transfer Coefficient | 11.1,11.2 | |

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|----|----|----------|--|------|--------|
| | Th | April 16 | The Log Mean Temperature Difference | 11.3 | |
| 15 | Tu | April 21 | Heat Exchanger Analysis | 11.4 | Quiz 4 |
| | Th | April 23 | Project presentation , Review for Final Exam | | HW 6 |

Assignments due for the week will be announced on canvas, please make sure to regularly check canvas for announcements.

Important Dates:

Census Date: January 26, 2026

Last day to withdraw: March 30, 2026

No Classes:

Martin Luther King, Jr. Holiday: January 19, 2026

Spring break: March 9-13, 2026

Final Exam: April 27- April 30, 2026 (TBA)

Note: This syllabus, including the grading criteria, schedule and the content, are tentative. They can be changed at anytime at the sole discretion of the instructor