

**MENG 3316 – Heat Transfer**  
**Course Syllabus**

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| <b>Semester / Year</b>                          | Spring 2025   |
| <b>Catalog Description</b>                      | Fundamentals and applications of conduction, convection, and radiation heat transfer. Analysis of steady-state and transient conduction employing analytical methods and numerical techniques. The simple theory of laminar and turbulent, free and forced convection, and the use of practical correlations. Basic thermal radiation concepts and applications. Three hours of lecture per week. |
| <b>Prerequisites</b>                            | MENG 3401 and MENG/CENG 3310.   |
| <b>Section Number</b>                           | 030   |
| <b>Instructor Name</b>                          | Dr. Hayder Abdul-Razzak   |
| <b>Contact Information</b>                      | Email: <a href="mailto:habdulrazzak@uttyler.edu">habdulrazzak@uttyler.edu</a>   |
| <b>Class Type / Instruction Mode / Location</b> | Face to face / Lecture/ HEC B210  |
| <b>Class Time</b>                               | TuTh: 3:30 pm to 4:50 pm  |
| <b>Office Hours</b>                             | TuTh: 5:00 pm to 6:30 pm or by appointment  |
| <b>No. of Credits</b>                           | 3 credits   |
| <b>Required Textbook</b>                        | Fundamentals of Heat and Mass Transfer, 8th edition, by Bergman, Lavine, Incropera, DeWitt, Wiley, 2018 (ISBN 978-1- 119-35388-1)   |
| <b>Optional References</b>                      | 1. Schaum's Outline of Heat Transfer, 2nd Edition (SCHAUMS' ENGINEERING) Paperback by Donald Pitts, Leighton E. Sissom, 2011<br>2. Heat Transfer, 1st edition, by Nellis and Klein, Cambridge University Press, 2009 (ISBN 978-1-107-67137-9)   |
| <b>Additional Rules and Requirements</b>        | Students can use AI programs (ChatGPT, Copilot, etc.) in this course. If you utilize an AI tool to help create content for an assignment, you must acknowledge and cite the tool's contribution to your work.   |
| <b>Evaluation Method</b>                        | Two Mid-term Exams 50%<br>Final Exam 25%<br>Homework and Quizzes 25%  |
| <b>Grading Policy / Scale</b>                   | Letter grades, scale:<br>A: 90 – 100; B: 80 – 89; C: 70 – 79; D: 60 – 69; F: < 60   |
| <b>Important Events / Dates</b>                 | Census date: 01/27/2025<br>Last date to withdraw from one or more 15-week courses: 03/31/2025<br>Final Exam: TBD<br>See UT Tyler Academic Calendar:<br><a href="https://www.uttyler.edu/schedule/files/2024-2025/academic-calendar-2024-2025-main-20240222.pdf">https://www.uttyler.edu/schedule/files/2024-2025/academic-calendar-2024-2025-main-20240222.pdf</a>                                |
| <b>Attendance / Makeup policy / other rules</b> | Regular attendance is required. In case you have to miss a class, it is your responsibility to keep up with the class work and be informed of all announcements made in the class.<br><b>Homework Assignments:</b> homework will be assigned according with the topics covered in lectures. Assignments are considered very important for   |



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|  | <p>the understanding of the course material. Completing your homework independently is an absolute necessity to do well in this course.</p> <p><b>Canvas:</b> Course syllabus, course material such as handouts and example problems with solutions, homework, assignments, homework solutions, review material, exam solutions will all be posted on Canvas. Please review all the material posted on Canvas on a regular basis.</p>  |
| <b>Course Learning Objectives / ABET &amp; PEOs Relation</b> | <p>By the end of this course, students will be able to:</p> <ol style="list-style-type: none"><li>1. apply the conservation of energy to basic heat transfer analysis.</li><li>2. apply the heat conduction equation in one-dimensional and limited multi-dimensional situations.</li><li>3. use a computer numerical solution for the numerical analysis of heat transfer.</li><li>4. apply engineering analysis to unsteady heat conduction.</li><li>5. apply convective heat transfer correlations to external and internal flows.</li><li>6. apply radiative heat transfer analysis techniques to engineering situations</li></ol> |
| <b>Tentative Topics / Course Plans</b>                       | <p>Week 1 Cover syllabus and intro to class.<br/>Week 2 Basic Concepts – Relationship with Thermodynamics.<br/>Week 3 Introduction to conduction.<br/>Week 4 One dimensional conduction.<br/>Week 5 Two-dimensional, Steady-state Conduction.<br/>Week 6 Transient Conduction.<br/>Week 7 Review &amp; First Exam.<br/>Week 8 Introduction to Convection.<br/>Week 9 External flow convection.<br/>Week 10 Internal flow convection.<br/>Week 11 Free convection.<br/>Week 12 Review &amp; Second Exam.<br/>Week 13 Heat Exchangers.<br/>Week 14 Radiation heat transfer.<br/>Week 15 Review</p>                                       |
| <b>University Policies</b>                                   | <p><a href="https://www.uttyler.edu/offices/academic-affairs/files/syllabus-information.pdf">https://www.uttyler.edu/offices/academic-affairs/files/syllabus-information.pdf</a></p>   |