Mechanical Engineering 331- Introduction to Heat Transfer

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Office: MEB 324, Office hours: Tuesdays 12:30-2:20 pm; Thursdays and Fridays 1:30-2:20 pm.

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Rodrigo Orozco, roo3@uw.edu, MEB G032E, Office hours: Wednesday, Friday 9:00-11:00 am.
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Text: Bergman, Lavine, Incropera and DeWitt, *Introduction to Heat Transfer*, Sixth edition, John Wiley & Sons.

Schedule: Mon, Wed, Fri. Lectures 12:30-1:20 pm in MEB 238; Tues. Recitation / Exams 3:30-5:20 pm in Bagley 260.
Tues, Wed, Thurs. Open sign-up for Laboratory Experiments 7:30 am – 6:00 pm in MEB G032E.

Grading: Two Midterms and Final Exam @ 100 = 300, 10 Homework Assignments @ 10 = 100, Four Laboratory Experiments @ 25 = 100, Total Possible Points = 500. P ≥ 475, G = 4.0; P = 400, G = 3.1; P = 350, G = 2.5

Homework: Homework assignments and solutions posted at: **http://courses.washington.edu/mengr331**

Policy: All laboratory experiments, reports, and exams must be completed to receive a final grade for the course. In fairness to all students, an individual may not take an exam outside the scheduled time due to the individual's workload or travel plans. Homework must be turned in by 5 pm on the indicated due dates with a time stamp at the main office. Late homework that is handed in at the main office will not be accepted. If you need an extension on homework due to unusual circumstances, ask the instructor at least one day prior to the deadline, then turn homework into her office by the agreed upon time.

Monday	Tuesday	Wednesday	Friday
March 27 Rate Equations, Conservation of Energy 1.1 - 1.7	**March 28** Conduction Laboratory	**March 29** Conduction Rate Equation, Thermal Properties of Matter 2.1 – 2.2	**March 31** Heat Diffusion Equation, Boundary and Initial Conditions 2.3 – 2.5
April 3 *Ch. 1-2 HW* Steady Plane Wall and Radial Systems, 3.1-3.4	**April 4** Extended Surface "Pin Fin" Laboratory	**April 5** Conduction with Thermal Energy Generation, 3.5	**April 7 *Conduction Lab Due*** Heat Transfer from Extended Surfaces, 3.6, 3.10
April 10 Steady 2-D Conduction, 4.1 - 4.3	**April 11 *Ch. 3-4 HW*** Transient Heat Transfer Laboratory	**April 12** Transient Conduction, Lumped Capacitance Method, 5.1 - 5.3	**April 14 *Pin Fin Analysis Due*** Transient Plane Wall and Radial Systems with Convection, 5.4 – 5.6
April 17 Semi-Infinite Solid, Transient 2-D and 3-D Conduction, 5.7-5.8, 5.11	**April 18 *Ch. 5 HW*** Review for Midterm Exam, Chapters 1-3, 5, Sections 4.1 - 4.3	**April 19** Convection Boundary Layers, Local and Average Convection Coefficients, 6.1 - 6.2	**April 21 *Transient Analysis Due*** Laminar and Turbulent Flow, Boundary Layer Equations 6.3 - 6.4
April 24 Boundary Layer Similarity, Dimensionless Parameters 6.5 - 6.8	**April 25 *Midterm* *Examination*** Chapters 1-3, 5, 4.1-4.3	**April 26** External Flow over Flat Plate 7.1 - 7.2	**April 28 *Ch. 6 HW*** External Flow over Cylinder 7.3 - 7.4
May 1 Flow over Sphere, Tube Banks, 7.5-7.6, 7.9	**May 2 *Ch. 7 HW*** Natural Convection Chapter 9 overview	**May 3** Internal Flow: Hydrodynamic Considerations, 8.1	**May 5 *Pin Fin Lab Due*** Internal Flow: Energy Balance and Thermal Considerations, 8.2 - 8.3
May 8 Laminar and Turbulent Tube Flows, 8.4-8.5, 8.9	**May 9** Heat Exchanger Laboratory	**May 10** Heat Exchangers 11.1 - 11.2	**May 12** Heat Exchanger Analysis 11.4 - 11.7
May 15 *Ch. 8, 11 HW* Blackbody Radiation 12.1 - 12.4	**May 16** Review for Midterm Exam, Chapters 6 - 8, 11	**May 17** Surface Emission 12.5	**May 19 *Heat Exchange Lab Due*** Absorption, Reflection, Transmission, 12.6
May 22 Kirchoff's Law, Gray Surface, 12.7 – 12.8	**May 23 *Midterm* *Examination*** Chapters 6 - 8, 11	**May 24** Environmental Radiation 12.9 - 12.10	**May 26 *Ch. 12 HW*** View Factor 13.1
May 29 Holiday	**May 30** Make-up Labs, Review Ch. 1-9, 11-13	**May 31** Blackbody Radiation Exchange, 13.2	**June 2 *Ch. 13 HW*** Gray Surface Radiation Exchange, Multimode Heat Transfer, 13.3-13.4
June 5 ***Transient Heat Transfer Lab Due***	**June 6 (optional review)** Review for Comprehensive Final, Chapters 1-9, 11-13	**Thursday June 8** Final Examination MEB 238, 8:30 – 10:20 am	**June 9 *Final due date for any missing Lab Reports***