

ME 503
TENTATIVE LECTURE OUTLINE—Spring 2014

Date	Lecture Topic	Reading Due	Assignments Due
Week 1:			
Jan. 14 (T.)	Course introduction; conservation laws; fundamentals	A&L; Ch. 1.1-1.5	
Jan. 16 (R.)	Course introduction; conservation laws; equations	A&L; Ch. 2.1-2.4	
Week 2:			
Jan. 21 (T.)	Parallel flows-I; steady and unsteady Poiseuille flow	A&L; Ch. 3.1	HW 1 Assigned
Jan. 23 (R.)	Parallel flows-II; steady and unsteady Couette flow	A&L; Ch. 3.2	
Week 3:			
Jan. 28 (T.)	Parallel flows-III; dissipation effect; buoyancy-driven flows	A&L; Ch. 3.3-3.4	HW 2 Assigned HW 1 Due
Jan. 30 (R.)	Parallel flows-IV; thermal boundary layers; fully developed heat transfer	A&L; Ch. 3.5-3.6	
Week 4:			
Feb. 4 (T.)	Nearly parallel (boundary layer) flows-I; principals	A&L; Ch. 4.1	HW 3 Assigned HW 2 Due
Feb. 6 (R.)	Nearly parallel (boundary layer) flows-I; conservation equations	A&L; Ch. 4.1	
Week 5:			
Feb. 11 (T.)	Nearly parallel (boundary layer) flows-II; momentum and thermal boundary layers	A&L; Ch.4.3	HW 4 Assigned HW 3 Due
Feb. 13 (R.)	Similarity transformation-I; principals	A&L; Ch. 5.1	
Week 6:			
Feb. 18 (T.)	Similarity transformation-II; example problems	A&L; Ch. 5.2	HW 5 Assigned HW 4 Due
Feb. 20 (R.)	In-Class Exam-I		
Week 7:			
Feb. 25 (T.)	Similarity solutions-III; fundamentals of heat transfer correlations	A&L; Ch. 5.3-5.4	HW 6 Assigned HW 5 Due
Feb. 27 (R.)	Similarity solutions-IV; fundamentals of heat transfer correlations-Continued	A&L; Ch. 5.3-5.4	
Week 8:			
Mar 4 (T.)	Time periodic convection; principals	A&L; Ch. 6.1-6.3	HW 7 Assigned HW 6 Due
Mar 6 (R.)	Time periodic convection; example problems	A&L; Ch. 6.2	
Week 9:			
Mar 11 (T.)	Spring Break		
Mar 13 (R.)	Spring Break		
Week 10:			
Mar 18	Turbulent convection; principals	A&L;	HW 7 Assigned

(T.)		Ch. 8.1	HW 6 Due
Mar 20 (R.)	Turbulent convection; governing equations	A&L; Ch. 8.2-8.7	
Week 11:			
Mar 25 (T.)	Turbulent convection; scaling laws	A&L; Ch. 9.1-9.2	HW 8 Assigned HW 7 Due
Mar 27 (R.)	Turbulent convection; heat transfer correlations-I	A&L; Ch. 9.3-9.4	
Week 12:			
April 1 (T.)	Turbulent convection; heat transfer correlations-II	A&L; Ch. 9.5-9.6	HW 9 Assigned HW 8 Due
April 3 (R.)	In-Class Exam-II		
Week 13:			
April 8 (T.)	Natural convection; principals	From handout	HW 10 Assigned HW 9 Due
April 10 (R.)	Natural convection; governing equations;	From handout	
Week 14:			
April 15 (T.)	Natural convection; scaling laws-I	From handout	HW 11 Assigned HW 10 Due
April 17 (R.)	Natural convection; scaling laws-II	From handout	
Week 15:			
April 22 (T.)	Dimensional Analysis ; principals	A&L; Ch. 12.1	HW 12 Assigned HW 11 Due
April 24 (R.)	Dimensional Analysis ; similitude	A&L; Ch. 12.2	
Week 16:			
April 29 (T.)	Dimensional Analysis ; example	A&L; Ch. 12.3-12.4	HW 13 Assigned HW 12 Due
May 1 (R.)	Review & catch up		

Final Exam: Thursday, May 8, 3:10am-6:10 pm

Course Description: ME503 (Convective Heat Transfer) is a course that deals with laminar and turbulent forced convection heat transfer over surfaces and inside tubes, including non-circular cross sections. The course also comprises developing flows, laminar free convection, and time periodic flows. Emphasis throughout is on the analytical approach.

Emergency Procedures: Southern Illinois University, Carbondale is committed to providing a safe and health environment for study and work. Because some health and safety circumstances are beyond our control, we ask that you become familiar with the SIUC Emergency Response Plan and Building Emergency Response Team (BERT) program. Emergency response information is available on posters in buildings on campus, available on BERT's website at www.bert.siu.edu, Department of Safety's website www.dps.siu.edu (disaster drop down), and in the Emergency Response Guideline pamphlet. Know how to respond to each type of emergency.

Instructors will provide guidance and direction to students in the classroom in the event of an emergency affecting your location. It is important that you follow these instructions and stay with your instructor during an evacuation or sheltering emergency. The Building Emergency Response Team will provide assistance to your instructor in evacuating the building or sheltering within the facility.