Syllabus

MEMS 5403: Theory of Conduction and Convection

This is the *tentative* information for the course and it is subject to change without notice. Check periodically! Last updated on January 16, 2017.

#	DATE	TOPIC	NOTES
1	1/17	Intro., Fourier Law, deriv. conduc. eqn., bound. cond.	—
2	1/19	1–D model, derive fin eqn., review elem. results	hw 1 assigned
3	1/24	Annular fin, Frobenius method	—
4	1/26	1–D unsteady intro., review, Dirichlet	hw 1 due / hw 2 ass.
5	1/31	Dirichlet Problem & Separation of variables	—
6	2/2	Dimensionless analysis, Robbins' problem	hw 2 due / hw 3 ass.
7	2/7	The Rayleigh problem, similarity analysis	—
8	2/9	2–D steady conduction, Dirichlet problem	hw 3 due / hw 4 ass.
9	2/14	Dirichlet prob. and numerical issues	—
10	2/16	uniqueness of solution, Neumann problem	hw 4 due / hw 5 ass.
11	2/21	Neumann example, superposition	—
12	2/23	3–D steady conduction	hw 5 due / hw 6 ass.
13	2/28	Convection: Conservation Laws	—
14	3/2	Dimensionless Analysis / No Slip	hw 6 due / hw 7 ass.
15	3/7	1–D Couette, Int. Transform	—
16	3/9	Integral Transform Method	hw 7 due / hw 8 ass.
—	3/14	NO CLASS	Spring Break
—	3/16	NO CLASS	Spring Break
17	3/21	**MIDTERM EXAM**	—
18	3/23	2–D Couette flow / viscous dissipation	hw 8 due / hw 9 ass.
19	3/28	2–D Couette flow / viscous dissipation	—
20	3/30	Couette Numerical Evaluation	hw 9 due / hw 10 ass.
21	4/4	Fully–developed pipe flow: const. heat flux	—
22	4/6	const. flux and remarks on const. temp.	hw 10 due / hw 11 ass.
23	4/11	Derivation of Boundary Layer Equations	—
24	4/13	Karman–Pohlhausen approximate solution	hw 11 due / hw 12 ass.
25	4/18	K–P soln. / similarity	—
26	4/20	numerical solution of similarity ODE	hw 12 due / hw 13 ass.
27	4/25	Piercy–Preston successive int. method	—
28	4/27	Piercy–Preston successive int. method	hw 13 due