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MAT 341: Applied Real Analysis
Fall 2016
Schedule & Homework

Schedule

The PDF version of the schedule is available for print **here**.

Date	Topic	Section	Assignments	Due date
Aug 30	Periodic functions and Fourier series	1.1	**1.1:** 1abc, 2ad, 4, 7b, 8	**HW1** Due Sept 8
Sep 1	Even & odd extensions, Fourier sine & cosine series.	1.2	**1.2:** 1, 7, 10b, 11bc	
Sep 6	*no class (Labor day)*			
Sep 8	Convergence of Fourier series	1.3	**1.3:** 1abd, 2ad, 5 6, 8	**HW2** Due Sept 13
Sep 13	Uniform convergence of Fourier series	1.4	**1.4:** 1ae, 2,4,5	**HW3** Due Sept 20
Sep 15	Basic operations on Fourier series	1.5	**1.5:** 2, 5, 9	
Sep 20	The heat equation. Steady-state solutions	2.1, 2.2	**2.1:** 2, 8; **2.2:** 2, 6	**HW4** Due Sept 27
Sep 22	Fixed-end temperatures. Transient solutions	2.3	**2.3:** 2, 6, 8	
Sep 27	Insulated bar; Examples	2.4	**2.4:** 4, 5, 8	**HW5** Due Oct 4
Sep 29	Different boundary conditions. Review	2.5	**2.5:** 4, 5, 6	
Oct 4	Convection. Eigenvalues and eigenfunctions	2.6, 2.7	**2.6:** 7, 9, 10	**HW6** Due Oct 11
Oct 6	**Midterm 1** in class, 10:00-11:20am. Covers 1.1-1.5, 2.1-2.4			
Oct 11	Sturm-Liouville problems. Relation to Fourier series	2.7, 2.8	**2.7:** 1, 3bc, 7	**HW7** Due Oct 18
Oct 13	Series of eigenfunctions & examples. Fourier integral	2.8, 1.9	**2.8:** 1; **1.9:** 1ab, 3a	
	Fourier integral & applications to PDEs.			

Oct 18	Semi-infinite rod	2.10	**2.10:** 3, 4	**HW8** Due Oct 25
Oct 20	The wave equation	3.1, 3.2	**3.2:** 3, 4, 5, 7	
Oct 25	The wave equation; Examples Solution to the vibrating-string problem	3.2	**page 255:** 18 **page 257:** 31	**HW9** Due Nov 1
Oct 27	D'Alembert's solution; Examples	3.3, 3.4	**3.3:** 1, 2, 5	
Nov 1	Laplace's equation. Review	4.1, 4.2	**4.1:** 1-6	**HW10** Due Nov 10
Nov 3	**Midterm 2** in class, 10:00-11:20am. Covers 2.5-2.8, 2.10, 1.9, 3.1-3.2			
Nov 8	Dirichlet's problem in a rectangle; Examples	4.2, 4.3	**4.2:** 5, 6	**HW11** Due Nov 15
Nov 10	Potential in a rectangle; Examples. Potential in unbounded regions	4.3, 4.4	**4.3:** 2b **4.4:** 4a, 5ab	
Nov 15	Polar coordinates. Potential in a disk	4.1, 4.5	**4.1:** 6 **4.5:** 1	**HW12** Due Nov 22
Nov 17	Dirichlet problem in a disk; Examples	4.5	**4.5:** 4	
Nov 22	Two-dimensional heat equation. Problems in polar coordinates	5.3, 5.4	**5.3:** 1, 7; **5.4:** 5	**HW13** Due Dec 6
Nov 24	*no class (Thanksgiving)*			
Nov 29	Bessel's equation. Temperature in a cylinder	5.5, 5.6	**5.5:** 4, 6; **5.6:** 3, 7	
Dec 1	Vibrations of a circular membrane	5.7	**5.7:** 2	
Dec 6	Spherical coordinates; Legendre polynomials	5.9	**5.9:** 6, 8	**Practice problems**
Dec 8	Review		**page 371:** 1, 2, 6	
Dec 16	**Final Exam** in class, 11:15am-1:45pm. The final is cumulative and it covers: 1.1-1.5, 1.9, 2.1-2.8, 2.10, 3.1-3.4, 4.1-4.5, 5.3-5.7, 5.9			