

**PHY 712 Electrodynamics**  
**9-9:50 AM MWF Olin 103**

**Plan for Lecture 5:**

**Reading: Chapter 1 & 2 in JDJ**

**Introduction to numerical methods**

- 1. Finite difference methods with 2-dimensional example (Section 1.13 of your textbook)**
- 2. Finite element methods with 2-dimensional example (Section 2.12 of your textbook)**

1/23/2017

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**PHY 712 Electrodynamics**

MWF 9-9:50 AM | OPL 103 | <http://www.wfu.edu/~natalie/s17phy712/>

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**Course schedule for Spring 2017**

(Preliminary schedule -- subject to frequent adjustment.)

Lecture date	JDJ Reading	Topic	HW	Due date
1 Wed: 01/11/2017	Chap. 1	Introduction, units and Poisson equation	#1	01/18/2017
2 Fri: 01/13/2017	Chap. 1	Electrostatic energy calculations	#2	01/18/2017
Mon: 01/16/2017		MLK Holiday - no class		
3 Wed: 01/18/2017	Chap. 1	Poisson equation and Green's theorem	#3	01/20/2017
4 Fri: 01/20/2017	Chap. 1 and 2	Poisson equation in 2 and 3 dimensions	#4	01/23/2017
5 Mon: 01/23/2017	Chap. 1 and 2	Brief introduction to grid solution methods	#5	01/25/2017
6 Wed: 01/25/2017	Chap. 2	Method of images	#6	01/27/2017
7 Fri: 01/27/2017				

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**PHY 712 -- Assignment #5**

January 23, 2017

Review last section of Chap 1 in Jackson.

1. Work Problem #1.24 in Jackson. Note that you can set this up as a linear algebra problem as we did in the lecture notes and can be solved directly for the three unknown values in Maple or Mathematica. It is not then necessary to use iteration methods. Also note that it is convenient to multiply the entire equation by  $4\pi\epsilon_0$  so that the values of  $4\pi\epsilon_0 \Phi$  are calculated directly. Also note that in these units,  $\rho = 1$ . These can be compared to the exact results in part (c) and to the series solution of the same system in Jackson problem 2.16.

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