

**Syllabus for 3342.515**  
**Classical ElectroMagnetism I**  
**Spring 2005**

**Course:**

Lecture: Mo/We 2:30–3:45  
Room: 024-306

**Lecturer:** Seonho Choi (최선희)

Office: 27-105  
Phone: 880-9193  
Email: [choi@phy.snu.ac.kr](mailto:choi@phy.snu.ac.kr)  
Web Page: <http://phy.snu.ac.kr/~choi>  
Office Hours: Mo 4:00–5:00, and by appointment

**Prerequisites:** Introductory modern physics, undergraduate E&M, basic computer programming language skill (C, C++, FORTRAN *etc*)

**Main textbook:** Classical Electrodynamics, 3<sup>rd</sup> Edition by John David Jackson

**References:** To be determined

**Topics to be Covered:** This course will cover *classical* electrodynamics in an advanced level. Needless to say, Electrodynamics (*or* Electromagnetism *or* E&M for short) deals with physics with electric charges. From stationary charges, we have electrostatics. When charges are moving around, combined with special relativity, we have magnetism. When charges are accelerated, we get electro-magnetic waves. For the first semester, we will deal with Chapters 1 to 6 of the textbook, which includes *Introduction to Electrostatics, Boundary-Value Problems in Electrostatics: I, Boundary-Value Problems in Electrostatics: II, Multipoles, Electrostatics of Macroscopic Media, Dielectrics, Magnetostatics, Faraday's Law, Quasi-Static Fields, Maxwell Equations, Macroscopic Electromagnetism, Conservation Laws*. Probably, most of these topics have already been in corresponding undergraduate classes somewhat in a limited way. In general, the graduate level course will require more advanced mathematics. At this stage, I am not sure if we will be able to cover EM waves in the first semester. Let's wait and see.

**Homework:** Homeworks will be given out every Monday in general and are due by the following Monday. Discussion with friends to solve the problem is *highly* recommended, but almost identical

answers will be investigated and might be nullified. Some homework problems are numerical calculation oriented and requires some computer programming language skill such as C-language or FORTRAN. If you are clever enough, you might be able to use programmable calculator.

**Exams:** There will be two exams: mid-term and final. The exams will be scheduled during regular class hours.

**Grading:**

Homework	100
Mid-term Exam	100
Final Exam	100
Total	300 points

**Working Together:** It is highly encouraged to work together on homework. But if you work together on a homework which requires a definite solution, please try to write up the solution on your own after discussion with your classmates. Working together on exams, of course, is expressly forbidden.

**Absences:** You are expected to attend every class. If you are not able to attend a class, please send me an e-mail (or a phone call) so that everybody won't have to wait for you. Planned absence to exams (in case of an emergency) should be notified as soon as possible so that you can get another chance to take the exams.

**Cheating:** Of course, cheating will be dealt strictly.

**Expectations:** I expect that everyone will maintain a classroom conducive to learning. I like an informal atmosphere, but it must be orderly. Thus, everyone is expected to behave with basic politeness, civility, and respect for others. In particular, talking in class is ok if it's part of a class discussion or with me. Private communications are not, especially during tests. Neither are reading extraneous materials, using electronic equipment (including cellular phone or PDA), or sleeping. If you intend to do these *irregular* activities, you had better skip the class. All the cellular phones should be turned off or put into the vibration mode during the class. **As usual, any reasonable questions are welcome anytime, anywhere. NEVER kill your curiosity.**

**Suggestions:** Suggestions for improvement are welcome at any time. Any concern about the course should be brought first to my attention. Further recourse is available through the Department Chair. Any improper wording or behavior from my part (sexual/personal/biased) can also be mentioned to me in private or in public.

**Time Table:**

Week	Dates		Topics to be covered	Comments
1		Mar. 2	Introduction	
2	Mar. 7	Mar. 9	Electrostatics Introduction	
3	Mar. 14	Mar. 16	Boundary Value Problems in Electrostatics I	
4	Mar. 21	Mar. 23		
5	Mar. 28	Mar. 30	No classes	학회 참석
6	Apr. 4	Apr. 6	Boundary Value Problems in Electrostatics II	
7	Apr. 11	Apr. 14		
8	Apr. 18	Apr. 21	Multipoles, Electrostatics of Macroscopic Media	Mid-term (Apr. 25)
9	Apr. 25	Apr. 27		
10	May 2	May 4	Magnetostatics, Faraday's Law, Quasi-Static Fields	
11	May 9	May 11		
12	May 16	May 18	Maxwell Equations, Macroscopic Electromagnetism, Conservation Laws	
13	May 23	May 25		
14	May 30	Jun. 1	Plane Electromagnetic Waves and Wave Propagation	현충일 (Jun. 6) Final (Jun. 15)
15	Jun. 6	Jun. 8		
16	Jun. 13	Jun. 15		