

Intermediate Electricity and Magnetism

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Rabi-II to Dhul-Qi'dah, 1436

Topics to be covered:

Introduction to Electricity and Magnetism (with some mathematical sophistication)

Boundary value problems in electrostatics and magnetostatics

Dielectrics media and Magnetic materials (not too deep)

Maxwell's equations

Conservation laws

Fields and Gauge Transformations

Electromagnetic Waves

Resonators and Wave Guides

Radiating systems and the Lienard-Wiechert potentials.

E&M and the Special Theory of Relativity

Textbooks

Classical Electrodynamics, J.D. Jackson, (3rd Edition John Wiley & sons, Inc. 1999)

Introduction to Electrodynamics Theory, D. J. Griffiths, (3rd Edition Pearson, 2008)

The Feynman Lectures on Physics, especially Vol-II (<http://www.feynmanlectures.caltech.edu/>)

References

Classical Electricity and Magnetism, W K H Panofsky and M Phillips, (2nd edition, Addison-Wesley, Reading MA 1962)

Electricity and Magnetism Edward M. Purcell. Berkley Physics Course –Vol. 2. (McGraw-Hill, NY 1963)

Electromagnetic Fields & Waves by P. Lorrain & D. Corson (2nd Edition, W.H. Freeman, 1970)

Schaum's outline Series Theory and Problems of Electromagnetic, by J. A. Edminister (McGraw-Hill book company, 1979)

What I expect of my students

High level of excitement to learn

Effort exerted in reading, thinking, solving, discussing and researching

Punctuality (to class and with submissions)

Interaction/ Engagement in class

Study from the textbooks (at least)

Summarize lessons learnt

Solve homework

Transparency and constructive criticism

A few comments

A few comments

The language of instruction: Arabic/ English??

A few comments

Do we get into QED?

A few comments

The 'extra' qualities/ skills you should acquire

A few comments

The 'extra' qualities/ skills you should acquire

English language, pedagogic discipline; camaraderie with colleagues, critical thinking, rational discussion, instruction, mathematical insight, computer programming

A few comments

Might we modify the syllabus?

A few comments

Something to think about..

A few comments

Something to think about..

How is E&M special in our lives?

A few comments

What's next?