Welcome to Physics 114

- Instructor: Dr. K. Burak Ucer
- Office: Olin 305D / Lab: Olin 209
- Phone: 758-4989
- E-mail: ucerkb@wfu.edu
- Class Hours: 8:30 - 10:30 am
- Lab Hours: 10:45 am - 12:45 pm
- Office Hours: M-F / 1:30-2:30 pm
  - or any other time

Class Material

- Text Book: Physics for Scientists and Engineers / Serway & Jewett / 8th edition
- Class Web Page (for lecture notes, homework questions, dates, etc.): http//www.wfu.edu/~ucerkb/Phy114.html
- Homework Assignments: WebAssign http://www.webassign.net

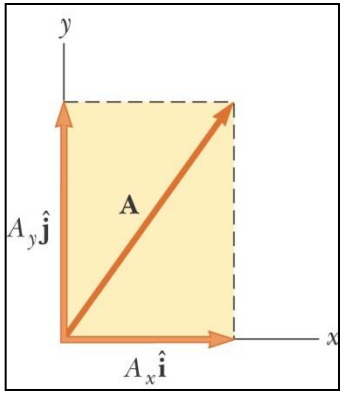
Subjects

- Electricity (Ch. 23-28)
  - Charges, currents, circuits
- Magnetism (Ch. 29-33)
  - Fields & forces, induction, AC
- Optics (Ch. 34-38)
  - EM Waves, images, interference & diffraction

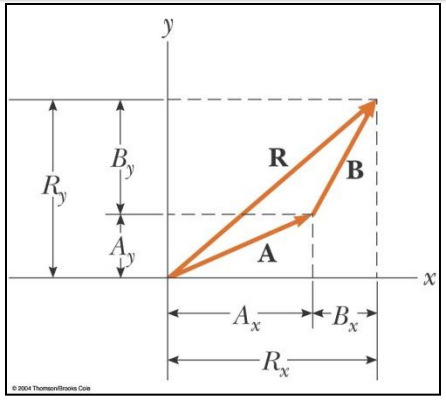
What Do You Need?

- A basic knowledge of calculus
- Vector algebra (vector addition, dot products, cross products)
- A grasp of the concepts of force, energy and power
- Some carry over from PHY 113 (fields, waves, rotational concepts)

Vectors



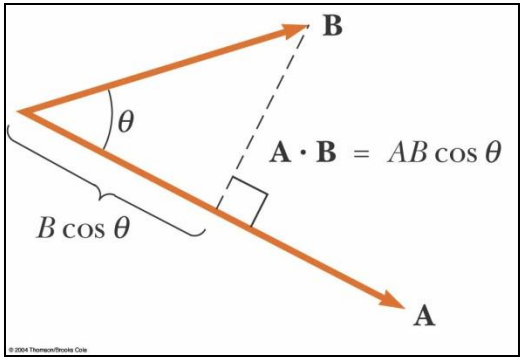
$$\mathbf{A} = A_x\hat{\mathbf{i}} + A_y\hat{\mathbf{j}}$$



$$\mathbf{A} = A_x\hat{\mathbf{i}} + A_y\hat{\mathbf{j}} \quad \mathbf{B} = B_x\hat{\mathbf{i}} + B_y\hat{\mathbf{j}}$$

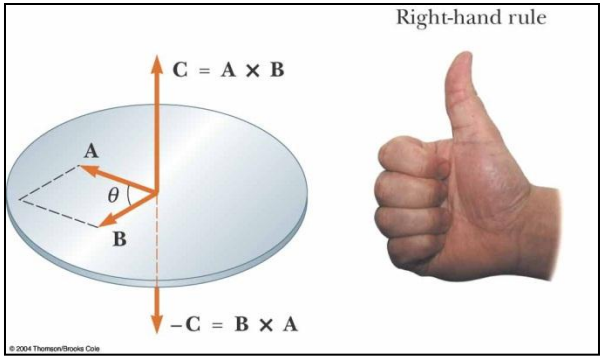
$$\mathbf{R} = \mathbf{A} + \mathbf{B} = \left(A_x + B_x\right)\hat{\mathbf{i}} + \left(A_y + B_y\right)\hat{\mathbf{j}}$$

Scalar (Dot) Product



$$\mathbf{A}\cdot\mathbf{B} = AB\cos\theta$$

Vector (Cross) Product



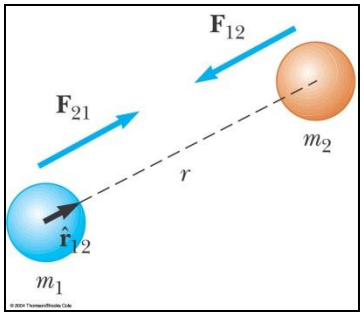
$$\mathbf{A}\times\mathbf{B} = \mathbf{C} \qquad C = AB\sin\theta$$

Forces and Fields

Gravitational Force

$$\mathbf{F}_{12} = -G\frac{m_1 m_2}{r^2}\hat{\mathbf{r}}$$

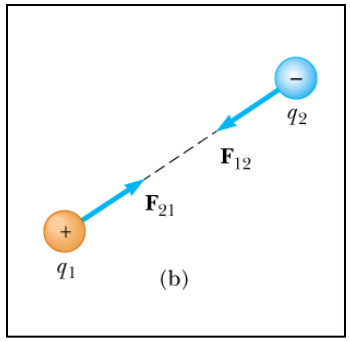
$$G = 6.673\times10^{-11}\,\mathrm{N.m^2/kg^2}$$



Electrical Force

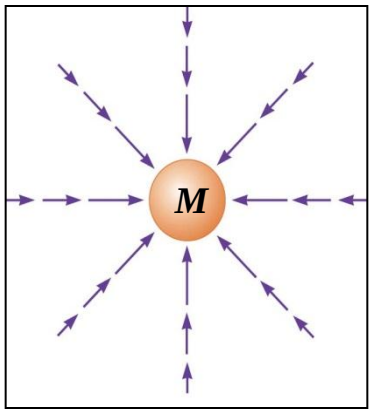
$$\mathbf{F}_{12} = k_e\frac{q_1 q_2}{r^2}\hat{\mathbf{r}}$$

$$k_e = 8.99\times10^{9}\,\mathrm{N.m^2/C^2}$$



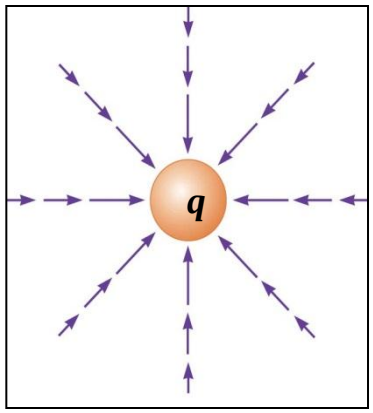
Gravitational Field

$$\mathbf{g} = \frac{\mathbf{F}_g}{m} = -G\frac{M}{r^2}\hat{\mathbf{r}}$$



Electric Field

$$\mathbf{E} = \frac{\mathbf{F}_e}{q} = k_e\frac{q}{r^2}\hat{\mathbf{r}}$$



Daily Assignments

- Homework problems will be assigned through WebAssign.
- 10 problems and/or concept questions.
- Due two lectures after assignment.
- 9 tries per question, no late submissions.
- Reading assignment: next lecture's chapter(s).
- Tutoring Sessions: TBD

Labs

- Labs start on 7/12/10 (Monday).
- The schedule is M-W-F in Olin 104.
- Lab times: Between 10:40 am and 12:30 pm.
- Lab TA is Maxim Zalutskiy
- Lab Manager is Eric Chapman (Olin 110)

Exams and Grading

- 3 Midterms + 1 Final (August 10 – 9:00 am)
- Midterms: 2 qualitative and 3 quantitative questions plus some multiple choice.
- May have 1-2 questions from the homework assignments.
- A cheat sheet will be provided with the formulas.
- Midterms: 15% each, Final: 30%, Lab: 15%, Homework: 10%

For Next Class

- Reading Assignment
  - Chapter 23 – Electric Fields