Modern Astrophysics II
SPRING 2013

Instructor: George E. McCluskey, Jr.

Office: Lewis Lab 409

Course Schedule: MWF 10:10 – 11:00; Lewis Lab 512
x83721; cgm0@lehigh.edu
Office Hours: To be arranged
Other hours by appointment

Textbook: An Introduction to Modern Astrophysics 2nd edition
B. W. Carroll and D. A. Ostlie, Addison - Wesley (2007)

Course Requirements:
1. Read all assigned material
2. Attendance is required
3. Complete all homework assignments on time
4. See instructor if you are having trouble

Grading: Your numerical grade will be determined as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Homework</td>
<td>20%</td>
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<tr>
<td>Term Paper I</td>
<td>25%</td>
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<td>Term Paper II</td>
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<tr>
<td>Final Examination (Written)</td>
<td>30%</td>
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<tr>
<td>TOTAL</td>
<td>100%</td>
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Course Material: Chapters 24-30 plus supplementary material.
TOPICS TO BE COVERED

1. The Milky Way Galaxy

   A. Overall Structure

      a. Disk
      b. Bulge
      c. Halo
      d. Nucleus

   B. Contents

      a. Stars
      b. Gas and Dust
      c. Star Clusters
      d. Dark Matter

   C. Nature of the Spiral Arms

   D. Formation and Evolution of the Galaxy

2. Galaxies

   A. Classification and Morphology

      a. Spiral Galaxies
      b. Barred Spiral Galaxies
      c. Elliptical Galaxies
d. Irregular Galaxies

3. The Local Group of Galaxies
   A. Contents, Interactions and Evolution

4. Clusters of Galaxies
   A. Contents, Interactions and Evolution
   B. The Importance of Mergers and Collisions of Galaxies

5. Large Scale Distribution of Galaxies
   A. Clustering, Walls Voids, etc.

6. Active Galaxies
   A. Seyfert Galaxies
   B. Radio Galaxies
   C. BL Lac Objects
   D. Quasars

7. The Theory of Active Galactic Nuclei (AGN)
   A. Supermassive Black Holes and Accretion
   B. Beams and Jets
   C. The Unified Model
D. Formation and Evolution

8. Cosmology

A. Historical Review
B. General Relativity and the FLRW Models
C. The Big Bang or the Steady State?
D. The Big Bang – Now the Paradigm
E. Inflationary Big Bang
F. Dark Matter and Dark Energy
G. Quantum Gravity and Quantum Cosmology

Accommodations for students with disabilities: If you have a disability for which you are or may be requesting accommodations, please contact both your instructor and the Office of Academic Support Services, University Center C212 (610-758-4152) as early as possible in the semester. You must have documentation from the Academic Support Services office before accommodations can be granted.