PHYS 1401 (all sections): Stellar Astronomy Laboratory
Syllabus for Spring 2006, W 3:00-4:50 am

Instructor: Dr. Wayne Keith (793-3874, keith.wayne@mcm.edu)
Office Hours: Science 110C - MW 9-11, TR 9:30-11, W 1:30-2:30, and F 9-10
Web: http://www.mcm.edu/~keith.wayne and http://val.brookscole.com
Text: Printed lab manual and Virtual Astronomy Laboratory Manual (for student ID code)
Class: VAL Class ID code 1364 (all sections)

Lab Description: This laboratory course is intended as an introduction to stellar astronomy (the study of stars). A combination of hands-on and computer based labs will be used over the course of the semester. For each of the hands-on labs, students are expected to study the procedure and theory sections **before coming to the laboratory**. The on-line labs will use the VIRTUAL ASTRONOMY LABORATORIES from the textbook publisher. These labs will be conducted in the computer classroom upstairs, and can be completed at any computer with Internet access. Typed lab write-ups will be required for all hands-on labs (see guidelines on back). Printed summaries of the virtual labs will be required. All materials are due in my mailbox in the physics department according to the following schedule:
Tuesday Lab – Due Friday 9:30 am.
Wednesday Lab – Due Monday 9:30 am.
Thursday Lab – Due Tuesday 9:30 am.

Lab Goal: Acquaint the student with scientific laboratory techniques and emphasize the underlying physical principles of astronomy.

Grading: Your final grade (25% of the lecture grade) will be determined by averaging your highest 10 lab grades.

Attendance/Make up policy: Failing to attend the lab meeting and/or not submitting a lab write up on time will result in a zero for the lab. If you cannot make a lab meeting, contact the instructor to see if you qualify to make it up at the end of the semester.

Phys1401 Lab Schedule

Dates	Lab Number	Lab Name
8/28 – 8/31		No Lab
9/5 – 9/7	1	Celestial Sphere
9/12 – 9/14	2	Earth & Sky
9/19 – 9/21	3	Law of Refraction & Reflection
9/26 – 9/28	4	Telescope Observing
10/3 – 10/5	5	Simple Lens
10/10 – 10/12		No Lab
10/17 – 10/19	6 (VAL 11)	The Spectral Sequence and the H-R Diagram
10/24 – 10/26	7 (VAL 12)	Binary Stars
10/31 – 11/2	8	Intensity of Light
11/7 – 11/9	9 (VAL 14)	Neutron Stars and Pulsars
11/14 – 11/16	10 (VAL 16)	Astronomical Distance Scales
11/21 – 11/23		No Lab
11/28 – 11/30	11 (VAL 17)	Evidence of Dark Matter
12/5 – 12/7		Makeup Lab Week

Astronomy Lab Report Guidelines

A formal report is required of each student for each hands-on experiment. Reports must be typed and will be judged on English usage as well as scientific content. The report should contain the following items:

1. Identification: Name of author and co-experimenters, name and number of experiment, date experiment was performed. (5 points)

2. Abstract: A simple statement of the objectives of the experiment followed by a single comment about how well those objectives were met. Reference any important numerical results. (5 points)

3. Apparatus: A list of the equipment used in the lab. Unfamiliar pieces of equipment should be described and diagrams should be included when possible. (10 points)

4. Theory: Discuss the underlying physical principles of the lab. Define new terms and give any mathematical formulae used. Explain how the formulae are used and what the variables stand for. (15 points)

5. Procedure: A brief, past tense narrative of what you actually did and why you did it. **This must be in the student's own words.** (10 points)

6. Data: Provide a table of the measurements made during the laboratory. Include units on all measurements. (10 points)

7. Analysis: provide a table of any calculations carried out using the measurements taken. Present any graphs made of your measurements. *Analyze* your results; tell me what the numbers actually mean. Discuss any graphs; tell me what you learned from them. Discuss any sources of uncertainty or how the measurements might have been improved. (15 points)

8. Conclusion: A brief discussion of what you conclude from your measurements and calculations. Mention any important numerical results. Make sure your conclusions are related to the principles discussed in the Theory section. (15 points)

The final 15 points will be given for the overall layout, organization, mechanics, grammar, and spelling of the write up.