ASTR 5460: Extragalactic Astronomy – Fall 2004

Michael Brotherton Instructor

General Information

Office: PS 217, x5402
Hours: Afternoons – drop in as you need to!
Email: mbrother@uwyo.edu
Website: http://physics.uwyo.edu/ mbrother
Meetings: Monday 10-10:50AM, Wednesday 9-10:50AM, Cinnamon Room (or Lab)
Extra meetings: To be announced in class (e.g., for the observing project)
Text: *Galaxies and Cosmology*, **2nd** Edition, by Combes, Boisse, Mazure, & Blanchard

Course Content

The official course title is "Galaxy Structure and Evolution; Cosmology," which is quite a mouthful! The official course description is a potpourri of extragalactic astronomy that could be split into several courses (and perhaps will be in a future curriculum revision). We will focus on a number of topics that every student in our graduate program should know about extragalactic astronomy. There is no perfect textbook for this. We will supplement *Galaxies and Cosmology* with other materials, particularly webpages and review articles.

The tentative schedule of topics with suggested reading is on the last page of this syllabus. This may be modified during the semester. Go to the course website for the most up-to-date official information.

Grading Scheme

This is a graduate course and all of you should work to earn grades of "A" (better than 80%) or "B" (70 to 80%). A grade of "C " or worse ($<$ 70%) is failing. The specific grade scale may be curved compared to raw scores – if so, I will let you know exactly how. I'll privately inform anyone doing C-level work my concerns, hopefully in time for that student to rebound.

We will have homework sets (probably 5-6), exams (a midterm and a final, both take home), an observing project, and a telescope proposal. The observing project will be decided on in the first 2-3 weeks of class. For the observing project, you will need to learn some IRAF or IDL, and for the homeworks and proposal you will need to learn LaTeX and some plotting program like IDL. The telescopes proposals will be for WIRO and due at the end of the semester – feel free to do a proposal for another telescope if that is more consistent with your research interests. We may also have one or two unconventional homeworks (e.g., reviewing telescope proposals, for instance) in place of or in addition to problem sets. The general breakdown will be:

Homework = 30%
Exams = 30%
Observing Project = 20%

Telescope Proposal = 20%

Having said all that, grades shouldn't be regarded as too important. What is important is that you all take the opportunity to learn as much as you can about extragalactic astronomy this semester. If you apply yourself and learn, you should get a decent grade. Most of you will probably do research related to these topics in the future, so work hard. In particular, don't just do the minimum. Work extra problems, do extra reading, above and beyond what I officially require. Use NASA ADS to look up some of the references in the textbook, or ones I mention during class. Also, everyone should make a habit of visiting the astro-ph preprint server at xxx.lanl.gov on a regular basis – now and after the course ends. Graduate-level classes are not just about passing with good grades, they are about mastering material relevant to your career.

Other Resources and Skills

Finally, there are a number of resources/skills that you're going to have to use or learn to use during this course. I won't necessarily spend class time on them unless I feel the need to do so, or if you really want me to.

NASA's Extragalactic Database (NED), http://nedwww.ipac.caltech.edu/ – both for information on specific objects and for the "level 5" review articles.

A plotting package, e.g., sm or IDL.

An image reduction package, e.g., IRAF or IDL.

LaTeX (See http://www.journals.uchicago.edu/AAS/AASTeX/ for example files).

The astrophysics preprint server at xxx.lanl.gov

NASA's Astrophysics Data System (http://adswww.harvard.edu/).

A number of other webpages and software packages may come up during the course of the course, but the above items are fundamental and important for nearly every observational astronomer.

Final Comments

I expect everyone to behave professionally, with the common end goal of learning a lot about extragalactic astronomy. Please provide me with feedback about the course during the semester so I can improve your learning experience. I'm very accommodating about anything and everything as long as the common end goal is supported. At this level, professors are as much facilitators as teachers – you must learn a lot of the material on your own in one fashion or another. Please help me help you do that.

Course Topic/Reading Schedule

Week	Topic	Text Reading
1	Classification/Morphology of Galaxies	Ch. 1
2	Kinematics and Masses of Galaxies	Ch. 3
3	Kinematics and Masses of Galaxies	
4	Elliptical Galaxies	Ch. 4
5	Spiral Structure	Ch. 5 (parts)
6	Galaxy Interactions	Ch. 7
7	Extragalactic Radio Sources	Ch. 8
8	Quasars and AGN	Ch. 9
9	More Quasars and AGN	
10	Large Scale Structure	Ch. 11
11	Galaxy Formation	Ch. 12
12	Cosmology	Ch. 13
13	No class – Thanksgiving Week	
14	Cosmology	
15	Catch-up/Special Topics, time permitting	