Astronomy 441 - Observational Astronomy

Spring Semester 2016

Professor: John T. Clarke jclarke@bu.edu CAS Building, Room 400 617-353-0247

Office Hours: - open door, in CAS room 400 or room 506

- feel free to send questions and comments by e-mail!

Course information can be accessed through the BU Blackboard Learn page (learn.bu.edu). This will be the source of schedules, notices, homework assignments, supplementary material, and grading information for this course. Anyone enrolled in the course can access the pages for AS441 by logging in with your BU username and Kerberos password.

Lectures: Mon/Wed/Fri 11:00 a.m. - noon Room 500 CAS Building

Discussion: Time TBD - this will be a time to go over the assignments and lab work.

Laboratory: Schedule TBD, will consist of both computer exercises in image processing and data reduction, and experimental work using the rooftop 14" telescope.

Course Grading:	Homework sets	20 % of grade
	Labs	25 % of grade
	Class Project	20 % of grade
	Midterm exam	15 % of grade
	Final Exam	20 % of grade

Assigned Texts: Astrophysical Techniques - C.R. Kitchin

An Introduction to Error Analysis - J.R. Taylor

(available at Barnes and Noble BU bookstore)

Other textbooks:
Fundamentals of Optics - Jenkins and White
Handbook of CCD Astronomy - S. B. Howell
Handbook of Astronomical Image Processing - Berry & Burnell
Optical Astronomical Spectroscopy - C.R. Kitchin
Data Reduction and Error Analysis for the Physical Sciences – Bevington
Observational Astronomy – Edmund C. Sutton

Overview of Course:

Astronomy 441 is the main course in the astronomy and astronomy/physics major where students gain some practical knowledge about the methods of research in astrophysics. Since Astronomy is an observational science, the methods of observation and data reduction are important for observers and theorists alike. Lectures for 3 hours per week will be supplemented by homework and laboratory assignments. In these, you will obtain observational data, apply methods of data reduction and analysis to these and to data sets from other telescopes, and write reports on the results of your work in the same format that will be used later in your career for published research papers. In addition, you will choose a class project, which will be a significant part of the course grade, and which will be presented at the end of the term.

Topics to be Covered:

- Historical summary of astronomical measurements

- Basic principles of remote observations of astronomical objects

- Overview of methods in different wavelength bands

- Optics of telescopes and spectrographs

- Statistics of measurements

- Light Detectors

- Space-based Instrumentation

- Optical Observing Methods: Photometry, Polarimetry

- Spectroscopy and Spectral Line Analysis

- Interferometry

- Fitting and Deconvolving Data

Spring Break Travel:

Over the week of spring break there will be a trip to visit NASA Goddard Space Flight Center and Wallops Flight Facility. We will drive down from Boston, and the travel will be funded by the AS Dept. Participation is not required, but in the past students have had a great time and an adventure. You can expect to have tours of both facilities, see spacecraft integration and test facilities, and possibly a launch from WFF. Last time we visited the Hubble Space Telescope Operations center, and had a tour of the large clean room where they are assembling and testing the James Webb Space Telescope.