UNIVERSITY OF CALGARY
DEPARTMENT OF PHYSICS and ASTRONOMY
COURSE OUTLINE

1. **Asph 507/607: Senior Astrophysics Laboratory/Advanced Observational Astrophysics**

Lecture Sections:

L01: TuTh, 11:00-11:50, ENF334

Instructor, Professor Russ Taylor
Office: SB517
Tel. No: 403-220-5416
e-mail address: russ@ras.ucalgary.ca
Office Hours: drop by or by appointment

Course websites: www.ras.ucalgary.ca/asph507

2. **PREREQUISITES:** (as in Calendar entry for course)

3. **GRADING**: The University policy on grading and related matters is described sections F.1 and F.2 of the online University Calendar. In determining the overall grade in the course the following weights will be used:

[Example:	Rothney Astrophysical Observatory Observing Proposal	10%
	Laboratory assignments (2)	50%
	RAO Observing Project Written Report	25%
	RAO Observing Project Oral Report (in-class)	10%

4. **Missed Components of Term Work**. The regulations of the Faculty of Science pertaining to this matter are found in the Faculty of Science area of the Calendar in section 3.6: **http://www.ucalgary.ca/pubs/calendar/current/sc-3-6.html**. It is the student's responsibility to familiarize himself/herself with these regulations. See also **http://www.ucalgary.ca/pubs/calendar/current/e-3.html**.

5. Observing project will be undertaken at the Rothney Astrophysical Obseravtory

6. In this course, the quality of the student's writing in laboratory reports will a factor in the evaluation of those reports. See **also http://www.ucalgary.ca/pubs/calendar/current/e-2.html**.

7. OTHER IMPORTANT INFORMATION FOR STUDENTS:

(a) ACADEMIC MISCONDUCT (cheating, plagiarism, or any other form) is a very serious offence that will be dealt with rigorously in all cases. A single offence may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under K. Student Misconduct (**http://www.ucalgary.ca/pubs/calendar/current/k.html**) to inform yourself of definitions, processes and penalties

(b) ASSEMBLY POINTS in case of emergency during class time. Be sure to FAMILIARIZE YOURSELF with the information at http://www.ucalgary.ca/emergencyplan/assemblypoints.

(c) ACADEMIC ACCOMMODATION POLICY. Students with documentable disabilities are referred to the following links:
Calendar entry on students with disabilities: **http://www.ucalgary.ca/pubs/calendar/current/b-1.html**
Disability Resource Centre: **http://www.ucalgary.ca/drc/**

(d) SAFEWALK: Campus Security will escort individuals day or night (**http://www.ucalgary.ca/security/safewalk/**). Call **220-5333** for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.

(e) FREEDOM OF INFORMATION AND PRIVACY: This course will be conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). As one consequence**, students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page**. For more information see also **http://www.ucalgary.ca/secretariat/privacy.**

(f) STUDENT UNION INFORMATION: VP Academic **Phone**: 220-3911 **Email**: suvpaca@ucagary.ca.
SU Faculty Rep. **Phone:** 220-3913 **Email:** sciencerep@su.ucalgary.ca Website **http://www.su.ucalgary.ca/home/contact.html**.
Student Ombudsman: **http://www.su.ucalgary.ca/services/student-services/student-rights.html**

(i) INTERNET and ELECTRONIC COMMUNICATION DEVICE Information. You can assume that in all classes that you attend,

your cell phone should be turned off. Also, communication with other individuals, via laptop computers, Blackberries or other devices connectable to the Internet is not allowed in class time unless specifically permitted by the instructor. If you violate this policy you may be asked to leave the classroom. Repeated abuse may result in a charge of misconduct.

Asph 507/607 - Winter 2012
Course Syllabus

This course is designed to teach advanced techniques in astronomical data collection, reduction and analysis through direct experience. Students will complete three laboratories, including one complete observing project using the facilities of the Rothney Astrophysical Observatory (RAO), and two other laboratories using data obtained previously from observations at international observatories. This year the laboratories will focus on continuum and spectral line observations from the world's largest radio and submillimetre wavelength telescope arrays, the Giant Metre-wave Radio Telescope (GMRT) and the Atacama Large Millimetre Array (ALMA). All three laboratories will involve data reduction, analysis and scientific interpretation. The RAO project will be written up in the form of a short professional journal article.

Observing programs are often collaborations of teams of astronomers. For this course students will work in groups of two. Each group will submit one report per assignment, including an in-class presentation on the RAO observing project at the end of the term.

There will be 14 classes over the term that last three of which will be devoted to the presentations on your RAO observing projects. Please see the schedule of classes for an overview of the plan for the term and to find out when the particular lectures will occur.

10 January - introduction to the course

12 January - RAO facilities (Dr. Phil Langill)

17 January - observing proposal and overview of observational astronomy and facilities

19 January - introduction to radio telescopes and radio telescope arrays

31 January - radio telescope fundamentals

2 February - principles and practice of aperture synthesis

7 February - principles and practice of aperture synthesis

9 February - introduction to CASA and continuum aperture synthesis calibration and processing

1 March - image processing, source detection, extragalactic radio source populations and source counts

6 March - spectral line interferometry

8 March - spectral line processing

5 April - RAO Observing project presentations

10 April - RAO Observing project presentations

12 April - RAO Observing project Presentations