

**UNIVERSITY OF CALGARY
DEPARTMENT OF PHYSICS AND ASTRONOMY
COURSE INFORMATION SHEET**

1. Course: ASPH 213, Introduction to Astrophysics

Lecture/Time/Session(s): L01: MW: 1530-1645, ST 132, Winter 2010
T01: M: 1700-1750, ST 132, Winter 2010

Instructor(s): L01: Dr. Wilson Office: SB 531, Phone: 220-6088
Office Hours: Thursday 14:00 - 16:00
Email: wjfwilson@ucalgary.ca

Physics and Astronomy Office: SB 605, 220-5385

Course Website: <http://courses.ucalgary.ca/asph213/>

Blackboard site: [ASPH 213 L01 - \(Winter 2010\) - Introduction To Astrophysics](#)

2. Prerequisite: Physics 211 or 221 or 227

Note: The Faculty of Science policy on pre- and co-requisite checking is outlined on page 203, columns 2 and 3 of the 2009-2010 Calendar. A student may not register in a course unless a grade at least "C-" has been obtained in each pre-requisite course; it is the responsibility of students to ensure that their registrations are in order.

3. The University policy on grading and related matters is described on pages 41-53 of the 2009 - 2010 Calendar. In determining the overall grade in the course the following weights will be used:

Homework Assignments (8):	30%	(Assignments MUST be stapled or paper clipped!) DUE AT BEGINNING OF CLASS!!! NO LATE ASSIGNMENTS WILL BE ACCEPTED!!!!!!
Lab Assignments (2)	15%	
In-class test (Wed. Mar 03)	20%	
Final Examination	35%	

There will be a final examination scheduled by the Registrar's Office. A passing grade on the final examination is required in order to pass the course.

4. Missed Components of Term Work. The regulations of the Faculty of Science pertaining to this matter are outlined on page 204, column 1 of the 2009-2010 Calendar. It is the student's responsibility to familiarize himself/herself with these regulations.

5. TEXTBOOK: *"Fundamental Astronomy, 5th ed."*, Karttunen, Kroger, Oja, Poutanen, & Donner, publ. Springer-Verlag.

IMPORTANT/SAFEWALK: Campus Security will escort individuals day or night. Call 220-5333 for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.

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 the heading "Student Misconduct (pages 49-53 for 2009-2010).

FOIP: This course will be conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIP). 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.

STUDENT UNION INFORMATION: VP Academic **Phone:** 220-3911 **Email:** suvpaca@ucalgary.ca
SU Faculty Rep. **Phone:** 220-3913 **Email:** sciencerep@su.ucalgary.ca

WJFW 15-1-10

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Department Approval: _____ Date: _____
Associate Dean's Approval for
out of regular class-time activity: _____ Date: _____

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Astrophysics 213 Course Schedule, Winter 2010

Day	Text Reference	Topics	Assignment Due Dates
M Jan 11 - W Jan 20 Part 1 - Introduction (Ch. 1 & 2 and Sections 7.1 & 7.2)			
M Jan 11	---	General Introduction to Course	
	Ch. 1	Introduction	
	2.1	Spherical Trigonometry	
	2.2	Coordinates on the Earth: Latitude and Longitude	
	2.3	The Celestial Sphere	
	2.4	The Horizontal Coordinate System	
	2.5	The Equatorial Coordinate System	
	2.7	The Ecliptic Coordinate System (no math)	
	7.1	Planetary Configurations	
	7.2	Orbit of the Earth and Visibility of the Sun	
	2.11	Constellations	
	2.13	Sidereal and Solar Time	
	2.15	Calendars (no math)	
	2.10	Positional Astronomy (parallax, proper motion)	
	2.9	Perturbations of Coordinates (precession, nutation, etc.)	
W Jan 13	2.3	The Celestial Sphere	
	2.4	The Horizontal Coordinate System	
	2.5	The Equatorial Coordinate System	
	2.7	The Ecliptic Coordinate System (no math)	
	7.1	Planetary Configurations	
	7.2	Orbit of the Earth and Visibility of the Sun	
	2.11	Constellations	
	2.13	Sidereal and Solar Time	
	2.15	Calendars (no math)	
M Jan 18	2.10	Positional Astronomy (parallax, proper motion)	
W Jan 20	2.9	Perturbations of Coordinates (precession, nutation, etc.)	
	---	Light and the electromagnetic spectrum (<i>course notes</i>)	
	2.10	Positional Astronomy (the Doppler effect)	
M Jan 25 - M Feb 01 Part 2 - E & M (2.10 & Ch. 4)			
M Jan 25	4.1	Flux and Luminosity	Lab #1: Observations this week; write-up due Wed., Feb. 24
	4.2	Apparent Magnitudes	
	4.4	Absolute Magnitudes	
	4.3	Magnitude Systems	
W Jan 27	4.3	Magnitude Systems	Assignment #1: Due Wed., Jan. 27
	4.5	Extinction and Optical Thickness	

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Day	Text Reference	Topics	Assignment Due Dates
M Feb 01	4.5 3.1 3.2	Extinction and Optical Thickness Observing Through the Atmosphere Optical Telescopes	
W Feb 03 - M Feb 08 Part 3 - Telescopes (Ch. 3)			
W Feb 03	3.2 3.3 3.4	Optical Telescopes Detectors and Instruments Radio Telescopes	Assignment #2: Due Wed., Feb. 03
M Feb 08	3.4 3.5 3.6`	Radio Telescopes Other Wavelength Regions Other Forms of Energy	
W Feb 10 - W Feb 24 Part 4 - Radiation (Ch. 5 & 15)			
W Feb 10	5.1 5.2	Radiation of Atoms and Molecules The Hydrogen Atom	Assignment #3: Due Wed., Feb. 10
Monday, February 15 is Alberta Family Day - University closed (but libraries open). February 14-21 is Reading Week. No lectures. University open except Monday.			
M Feb 22	5.3 5.4 5.5 5.6 5.7 5.8 5.9 5.10 15.2 15.3	Line Profiles: natural line width; Doppler broadening Quantum Numbers, Selection Rules, Population Numbers Molecular Spectra Continuous Spectra Blackbody Radiation Temperatures Other Radiation Mechanisms Radiative Transfer Interstellar Gas (no math) Interstellar Molecules (extra math not in textbook)	
W Feb 24 - M Mar 15 Part 5 - Sun & Stars (Ch. 8, 10, 12)			
W Feb 24	12.1 12.2	The Sun: Internal Structure The Atmosphere of the Sun	Lab #1: Write-up due Wed., Feb. 24
M Mar 01	---	Review for Midterm Test	
W Mar 03 Midterm Test: Chapters 2, 3, 4, 5, 7			
M Mar 08	12.3 8.1 8.2	Solar Activity Measuring Spectra The Harvard Spectral Classification	Lab #2: Take-home lab; write-up due Mon., Mar. 29
W Mar 10	8.3 8.4 8.5	The Yerkes Spectral Classification Peculiar Spectra The Hertzsprung-Russell Diagram	Assignment #4: Due Wed., Mar. 10

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Day	Text Reference	Topics	Assignment Due Dates
M Mar 15	8.7 10.1 10.2 10.3 10.4	What Do the Observations Tell Us? Stellar Models: Internal Equilibrium Conditions Physical State of the Gas Stellar Energy Sources Stellar Models (discussion only, no math)	
M Mar 15 - M Mar 22		Part 6 - Celestial Mechanics (Ch. 6 or a 1st year Physics text)	
	Ch. 6 Ch. 6 Ch. 6 Ch. 6	Ptolemy's Epicyclic Model Copernicus' Heliocentric Model Ellipses and Kepler's Three Laws of Planetary Motion Force and Newton's Law of Gravitation	
W Mar 17	Ch. 6 Ch. 6	Force and Newton's Law of Gravitation Centre of Mass	Assignment #5: Due Wed., Mar. 17
M Mar 22	Ch. 6 Ch. 6 Ch. 6 Ch. 6	Kepler's Laws for Two Bodies Elliptical Orbits Escape Velocity Virial Theorem and Jeans Mass	
W Mar 24 - M Apr 05		Part 7 - Stellar Evolution (Ch. 11)	
W Mar 24	11.1 15.4 11.2	Evolutionary Timescales The Formation of Protostars Contraction of Stars Toward the Main Sequence	Assignment #6: Due Wed., Mar. 24
M Mar 29	11.3	The Main Sequence Phase	Lab #2: Write-up due Mon., Mar. 29
W Mar 31	11.4	The Giant Phase	Assignment #7: Due Wed., Mar. 31
Apr 2 is Good Friday Holiday. University Closed			
M Apr 05	11.5 11.8	The Final Stages of Evolution The Origin of the Elements	
W Apr 07	--	Extra Topics if Time Permits	
M Apr 12	--	Extra Topics if Time Permits	Assignment #8: Due Mon., Apr. 12
W Apr 14	--	Review for Final Exam	

The last day of lectures for Winter, 2010, is Friday, April 16.