

**UNIVERSITY OF CALGARY
DEPARTMENT OF PHYSICS AND ASTRONOMY
COURSE OUTLINE**

1. Course: **ASPH 213, Introduction to Astrophysics**

Lecture Sections:

L01: MW 15:30 – 16:45 ST 139 Dr. W. Wilson SB 531 Phone: 220-6088 Office hours: W 13:10 – 15:10
T01: M 17:00 – 17:50 ST 139 Dr. W. Wilson Email: wjfwilso@ucalgary.ca

Main Office: SB 605, 220-5385 **Blackboard Course:** [ASPH 213 L01 - \(Winter 2012\) - Introduction To Astrophysics](#)
PHYS 259 Course Website: <http://webapps3.ucalgary.ca/~dppvan/asph213/>

2. Prerequisite: Physics 211 or 221 or 227

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:

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	20%	(Wed. Feb 29)
Final Examination	35%	(To be scheduled by the Registrar)

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.

In ASPH 213 we are using: Percentage grades will be given for all elements of term work and examinations in ASPH 213. A weighted course percentage will be calculated for each student after the final exam is written. A table of conversion from final course percentage to final course letter grade will be published on the ASPH 213 Blackboard site later in the term.

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

6. **EXAMINATION POLICY:** Calculators are permitted on the final exam. Students are encouraged to read the Calendar, Section G, on Examinations: <http://www.ucalgary.ca/pubs/calendar/current/g.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 (FOIPPA). 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@ucalgary.ca.
SU Faculty Rep. **Phone:** 220-3913 **Email:** sciencerep@su.ucalgary.ca
Website <http://www.su.ucalgary.ca>
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.

Astrophysics 213 Course Schedule, Winter 2012

Day	Text Reference	Topics	Assignment Due Dates
M Jan 09 - W Jan 18 Part 1 - Introduction (Ch. 1 & 2 and Sections 7.1 & 7.2)			
M Jan 09	---	General Introduction to Course	
	Ch. 1	Introduction	
	2.1	Spherical Trigonometry	
	2.2	Coordinates on the Earth: Latitude and Longitude	
W Jan 11	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 16	2.10	Positional Astronomy (parallax, proper motion)	
W Jan 18	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 23 - M Jan 30 Part 2 - E & M (2.10 & Ch. 4)			
M Jan 23	4.1	Flux and Luminosity	
	4.2	Apparent Magnitudes	
	4.4	Absolute Magnitudes	
	4.3	Magnitude Systems	
W Jan 25	4.3	Magnitude Systems	Assignment #1: Due Wed., Jan. 25
	4.5	Extinction and Optical Thickness	
M Jan 30	4.5	Extinction and Optical Thickness	
	3.1	Observing Through the Atmosphere	
	3.2	Optical Telescopes	
W Feb 01 - M Feb 06 Part 3 - Telescopes (Ch. 3)			
W Feb 01	3.2	Optical Telescopes	Assignment #2: Due Wed., Feb. 01
	3.3	Detectors and Instruments	Lab #1: Take-home lab; write-up due Mon., Mar. 05
	3.4	Radio Telescopes	
M Feb 06	3.4	Radio Telescopes	
	3.5	Other Wavelength Regions	
	3.6	Other Forms of Energy	

CONTINUED ON NEXT PAGE

Day	Text Reference	Topics	Assignment Due Dates
W Feb 08 - M Feb 13 Part 4 - Radiation (Ch. 5 & 15)			
W Feb 08	5.1 5.2	Radiation of Atoms and Molecules The Hydrogen Atom	Assignment #3: Due Wed., Feb. 08
M Feb 13	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 15 - M Mar 12 Part 5 - Sun & Stars (Ch. 8, 10, 12)			
W Feb 15	12.1 12.2	The Sun: Internal Structure The Atmosphere of the Sun	Assignment #4: Due Wed., Feb. 15
Monday, February 20 is Alberta Family Day - University closed (but libraries open). February 19-26 is Reading Week. No lectures. University open except Monday.			
M Feb 27	---	Review for Midterm Test	
W Feb 29 Midterm Test: Chapters 2, 3, 4, 5, 7			
M Mar 05	12.3 8.1 8.2	Solar Activity Measuring Spectra The Harvard Spectral Classification	Lab #1: Write-up due Mon., Mar. 05
W Mar 07	8.3 8.4 8.5	The Yerkes Spectral Classification Peculiar Spectra The Hertzsprung-Russell Diagram	
M Mar 12	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 12 - M Mar 19 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	

CONTINUED ON NEXT PAGE

Day	Text Reference	Topics	Assignment Due Dates
W Mar 14	Ch. 6 Ch. 6	Force and Newton's Law of Gravitation Centre of Mass	Assignment #5: Due Wed., Mar. 14
M Mar 19	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 21 - M Apr 02		Part 7 - Stellar Evolution (Ch. 11)	
W Mar 21	11.1 15.4 11.2	Evolutionary Timescales The Formation of Protostars Contraction of Stars Toward the Main Sequence	Assignment #6: Due Wed., Mar. 21
M Mar 26	11.3	The Main Sequence Phase	Lab #2: Write-up due Mon., Mar. 26
W Mar 28	11.4	The Giant Phase	Assignment #7: Due Wed., Mar. 28
M Apr 02	11.5 11.8	The Final Stages of Evolution The Origin of the Elements	
W Apr 04	--	Extra Topics if Time Permits	
M Apr 09	--	Extra Topics if Time Permits	Assignment #8: Due Mon., Apr. 09
W Apr 11	--	Review for Final Exam	

The last day of lectures for Winter, 2012, is Friday, April 13.