Syllabus and course plan*

PHYS2053: Galaxies & Cosmology, DU Autumn 2010

4 credits, can count toward your Astronomy or Physics minor.

GOALS: To bring the student to a modern level of understanding about the origin and evolution of our galaxy, galaxies and the universe, using principle of physics and computation to explore structure and internal/external dynamical changes. Modern discoveries involving galaxies in our universe, and cosmological theories based on these, plus particle physics findings will be examined using the tools of modern physics and astronomy.

Class meets: Mon & Wed 2-345pm, SpaceSciLab room 323; office hour = 4pm Mon.
Instructor: Prof. Stencel, rstencel@du.edu, 303-871-2135, SSL room 409
Textbook: Carroll & Ostlie, Introduction to Astrophysics, Addison-Wesley 2006 edition II.
Reference books*: Kutner, Astronomy: A Physical Perspective, 2nd ed., Cambridge 2003; Zeilik & Gregory, Intro. Astron.Astrophys., 4th ed. Saunders 1998; Shu, Intro Astro. etc.

*Available at Penrose Library: QB461.C35; QB801.O885 & QB 400s-800s

PHYS 2053 - Galaxies/Cosmology – SCHEDULE PLAN**

WEEK	TOPIC	READING	HOMEWORK Due, Monday class	PROJECT
1	Milky Way I	Ch.24a	--	Orientation
2	Milky Way II	Ch.24b	Prob.Set One	
3	Galaxies I	Ch.25a	Prob.Set 2	Proj. 1 due
4	Galaxies II	Ch.25b	Prob.Set 3	
5	Galactic Evolution	Ch.26	& Quiz one	
6	Structure	Ch.27	Prob.Set 4	Proj. 2 due
7	Active Galaxies	Ch.28	Prob.Set 5	
8	Cosmology I	Ch.29a	Prob.Set 6	
9	Cosmology II	Ch.29b	& Quiz 2	Proj. 3 due
10	Early Universe	Ch.30	Prob.Set 7	
Final**	Wed.Nov. 22nd			

**Subject to change as conditions require.

Choice of observational or computational projects, described in class.
Guarantee: If you will invest 2-3 hours studying, for each hour in class, you can master this subject!
Grading will be based on combination of attendance, participation, problem sets, projects, quizzes and the final exam. Scale and breakpoints nominally are:
A-/B+ @90%, B-/C+ @80%, C-/D+ @70% etc.
Grades will be posted/updated at Blackboard6.du.edu
Late papers lose 10% of max value per day overdue.
Honor code in effect, see website www.du.edu/honorcode
Please turn off your cell phone during class.
Over...

In prep for project updates in class, please consider the following guidelines:
1-use a lab report outline for structure: Goals, Methods, Results;
2a-Observing projects: explain what is known about your class of objects AS WELL AS gathering images of same;
2b-Computational projects: what is the method designed to accomplish and how does it relate to stellar physics;
3-on your portfolio site, 2 to 3 slides in ppt or pdf format (please save in ppt and not pptX format if possible);
4-in class, a short talk using those slides to illustrate your topic;
5-updated weekly.

PROJECT OPTIONS: OBSERVATIONAL OR COMPUTATIONAL ASTROPHYSICS

COMPUTATIONAL PROJECTS – appropriate for physics majors, astronomy minors or anyone familiar with programming (C, IDL, fortran, other). Choice of 3 topics includes comet tails, meteor dynamics, 3 body problem, polytropes, stellar models, stellar atmospheres, white dwarf structure and more...
http://www.scholarpedia.org/article/Category:Computational_Astrophysics
http://www.scholarpedia.org/article/Computational_cosmology

Articles in category "Computational Astrophysics" includes: Accretion Discs; Computational Astrophysics; Core-collapse Supernova Simulations; Dark energy; Dark matter; Fast dynamos; First stars; Flux Transport Dynamos; Galactic Magnetic Fields; Gamma Ray Bursts; Hydromagnetic Dynamo Theory; MHD Reconnection; Magneto-Convection; Magnetohydrodynamics; Magnetorotational Instability; N-body Simulations; Nonlinear Dynamos; Quark Stars; Radiative Transfer; Shock Structures; Supernova Type Ia Simulations; Type Ia Supernovae, WMAP, etc. & COMPUTER PROBLEMS FROM TEXT & KUTNER.

OBSERVATIONAL PROJECTS–
Appropriate for other majors or those interested in discovering the contents of the universe using remote control telescopes:
A. Go to this link to sign up: http://portal.tzecmaun.org/student/signup.php
B. Join the University of Denver team.
C. Use this password to access the sign-up page: pioneer
D. Video tutorials: http://www.tzecmaun2.org/video/sky_chart/sky_chart.html

To log in and schedule telescopes: http://www.tzecmaun2.org/?q=node/170

PROJECT TOPICS – see list at:
http://www.du.edu/~rstencel/stn_proj.htm
Additional important planning tool: www.calsky.com