Course Outline

ASTA02H3
Introduction to Astronomy and Astrophysics II:
Beyond the Sun and Planets

University of Toronto at Scarborough
Winter 2013

Instructor:
Dr. Parandis Khavari
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Lectures:
Tuesdays and Thursdays, 10am - 11am
Location: Lecture Room SW 128

Course Description:
This course uses the basis developed in ASTA01H to extend consideration to all stars, galaxies and the Universe. The structure and evolution of stars and galaxies is considered, with our own galaxy, the Milky Way, providing the opportunity for detailed study of a well-observed system. Even this system challenges us with many unanswered questions, and the number of questions increases with further study of the universe and its large-scale character. Current models and methods of study of the universe will be considered. The course is suitable for both science and non-science students.

Website:
This course will use the Blackboard system. All the material, including the assignments, as well as important dates and announcements will be posted on Blackboard. Any questions of a non-personal nature should be posted on the Discussion Board. The aim is to prevent the repetition of questions and answers as many students might have similar questions. Please ensure that you visit the course website frequently.

Tutorials:

Students registered in the course are expected to enroll in one tutorial session. Tutorials are 50 minutes in duration, and are held every Thursday starting in the second week of classes. Your TAs this semester are Alex Venditti, Cindy Yang and Naoya Kobayashi.

Textbook:

The textbook for this course is *"Astro"* by Dana Backman and Michael A. Seeds (ISBN 978-0538738040). Copies are available at the UTSC bookstore and of course Amazon. Another helpful study aid is the *"Schaum's Outline of Astronomy"* by Stacey Palen (ISBN 978-0071364362) but this is not a required book. The paperback copy of this book is priced at under CAD$25 and a Kindle edition is available under CAD$10.

Office Hours:

Thursdays from 9:00 am - 10:00 am.

Evaluation:

20%	Midterm I : Tuesday, February 12th, 2013
20%	Midterm II : Tuesday, March 19th, 2013
20%	Four Online Assignments (each worth 5%)
40%	Final Exam

It is the student's responsibility to be available for all the evaluation elements of this course.

Outline of Lecture Course (only an approximate guide):

• *Stars*: Distances, Apparent Brightness, Intrinsic Brightness and Luminosity
• *Stars:* Temperature, Mass, Size and Spectrum, Brief Review of Black Body Radiation and Wien's Law, Spectral Classification
• *Stars:* Structure and Formation of Stars, Brown Dwarfs, Hydrostatic Equilibrium, Energy Transport, Energy Sources of Stars
• *Evolution and Faith of Stars:* Main Sequence, Red Giants, Supernovae, White Dwarfs, Neutron Stars and Black Holes
• *Galaxies:* History of Galaxies, Types of Galaxies, Distance, Size and Mass and Structure of Galaxies, Luminosities, Stellar Populations and Dark Matter

• *Cosmology:* Expansion of the Universe, Hubble's Law, Einstein's Prediction of the Expansion
• *Big Bang:* Birth of the Universe, Cosmic Microwave Background Radiation, Brief Review of Big Bang Nucleosynthesis, Acceleration of the Universe, Curvature of the Universe, The Fate of the Universe

Miscellaneous:
• Midterm I covers the material taught from the beginning of the course up to (*and not including*) the material taught on February 7th class.

• Midterm II covers the material taught from (and including) February 7th up to (*and not including*) the material taught on March 14th.

• The final exam will cover *all of the material*. All the exams will have a multiple choice format.

• You will want to bring a non-programmable calculator to the midterms and the final exam session. No other aids are allowed. Any necessary equations will be provided.

• Any material discussed in class, during the tutorial, or found in the relevant chapters of the textbook, may appear on the midterms and final exam, unless otherwise stated.

• If you miss one of the midterms for a valid reason (medical issues, for example) then your final exam grade will be worth 60%.

Although I have made every effort to insure the accuracy of this course outline, errors may still exist. If you notice an error, please inform me. If any changes to this outline is made, it will be announced.