PHYSICS 416 SYLLABUS, SPRING 2019

COSMOLOGY

Cosmology, the study of the Universe, its birth and evolution, is currently experiencing a tremendous renaissance, mostly due to a plethora of new observations. This introduction to modern cosmology discusses the Big Bang, the expanding Universe and the basic cosmological parameters describing it, the dynamics of our Universe (dominated by some yet unspecified dark matter and dark energy), arguments for an early inflationary period, the formation of light elements in the early universe. We will also discuss the wealth of information we can extract from measurements of the Cosmic Microwave Background (CMB) and basic ideas on structure formation in the Universe. The class will be at the upper undergraduate level and will make use of calculus and differential equations. The prerequisite for this class is PHYS 324, Modern Physics.

By the end of the semester, you will have an up to date knowledge of the evolving state of affairs in cosmology, of the things we are pretty sure we understand, as well as of the open issues that arguably make cosmology one of the most exiting areas of physics and astronomy today. We will focus our efforts on understanding the concepts of cosmology, their observational foundation, and their range of applicability. We will follow the second edition of the book "Introduction to Cosmology" by Barbara Ryden (see below) – our goal will be to cover the entire book.

Instructors:
Dr. Markos Georganopoulos (georgano@umbc.edu)
Dr. Eileen Meyer (meyer@umbc.edu)

Lectures, time and place: Tuesday and Thursday 5:30-6:45 PM in PHYS 401 (not in Meyerhoff Chemistry 256 as listed).

Office Hours: Tuesday and Thursday 1:30-2:45 PM in PHYS 409 (MG) or PHYS 312 (EM)

Required Text: "Introduction to Cosmology" by **Barbara Ryden. Second edition**, publisher: Cambridge University press, ISBN-13: 978-1107154834

Academic Integrity: By enrolling in this course, each student assumes the responsibilities of an active participant in UMBC's scholarly community in which everyone's academic work and behavior are held to the highest standards of honesty. Cheating, fabrication, plagiarism, and helping others to commit these acts are all forms of academic dishonesty, and they are wrong. Academic misconduct could result in disciplinary action that may include, but is not limited to,

suspension or dismissal. To read the full Student Academic Conduct Policy, consult the UMBC Student Handbook, the Faculty Handbook, or the UMBC Policies section of the UMBC Directory.

Grading

Homework (30%): A homework will be assigned every week. Students are expected to solve all the problems of the homework and to turn in their solutions at the beginning of class on the due day of the homework. These solutions (assuming they demonstrate a clear attempt to solve the problem) will be worth 2 points out of 10 as "completion" credit. The remaining 8 points can be earned during the 'quiz' in the first 15 minutes of class on the day the homework is due. In this quiz, the students will be asked to clearly reproduce the solution to one of the homework problems selected by the instructor.

Midterm (30%): The midterm will cover the material from the beginning of the class up to the lecture before the midterm. The class will be notified at least a week in advance.

Final Exam (40%): An exam at the end of the course on all the course material, with somewhat more emphasis on the material discussed after the midterm.

NOTE: Clear handwriting, proper English grammar and syntax, as well as logical flow of your arguments and no missing steps are required in all exams and homework.

Please let us know in advance if you cannot participate in a quiz or exam due to religious or other reasons.