Textbook:

*Introduction to Cosmology, 2nd Ed.* – Barbara Ryden (Addison Wesley). You may use the first edition of the book, if you find it. However, I will assign problems from the second edition and these are some of the things that are likely to change. You are responsible for doing the problems based on the second edition.

This course is an upper-level astronomy course dealing with the modern astrophysical theory of the beginning and evolution of the Universe. The science of cosmology is the branch of astrophysics that deals with these issues. We will gain an introductory understanding of the modern ideas on how the Universe began and developed. We will cover the basics of the Big Bang Theory, multi-parameter cosmological models, the cosmic microwave background radiation, cosmic inflation, and nucleosynthesis of the lightest elements. We will have a very brief intro to the mathematics of General Relativity, enough to allow us to see where the Friedmann equation comes from. I assume you have at least two years of Calculus and at least one semester of upper level Mechanics, Electromagnetic theory, and Thermodynamics in your background. ASTR 4010 and 4020 are recommended, but not required for this course. Weekly information about the course, homework assignments, etc., will be posted on the website.

Grading: Three to five homework problems will be assigned each week (or every few weeks) during the Tuesday class. They are due either the following Tuesday or in two weeks, with the exact due date announced in class and on the website. You may work with others in the class on the homework, but, if you choose to do so, you must write on the homework who you worked with. There is no penalty for working with others, but I will assign the same exact grade to all the people who worked on the problem together. There will be three midterms; on Tuesday, February 10th, on Thursday, March 19th, and
on Thursday, April 16th. The final exam for this course will be on Tuesday, May 5th. The assigned homework will constitute 15% of your grade, the midterms 20% each for a total of 60%, and the final 25%. If you miss an exam, you will have to schedule a makeup exam within one week of the original exam date. For every two days that any homework assignment is late, ten points will be deducted from the final score for that homework.

GRADING POLICY

At the end of the semester, your overall grade will be determined from your exams and homework. Your final letter grade will be converted to a letter grade using the following scale:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Score Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>92.00 – 100.00</td>
</tr>
<tr>
<td>A-</td>
<td>87.00 – 91.99</td>
</tr>
<tr>
<td>B+</td>
<td>84.00 – 86.99</td>
</tr>
<tr>
<td>B</td>
<td>80.00 – 83.99</td>
</tr>
<tr>
<td>B-</td>
<td>76.00 – 79.99</td>
</tr>
<tr>
<td>C+</td>
<td>72.00 – 75.99</td>
</tr>
<tr>
<td>C</td>
<td>68.00 – 71.99</td>
</tr>
<tr>
<td>C-</td>
<td>60.00 – 67.99</td>
</tr>
<tr>
<td>D</td>
<td>50.00 – 59.99</td>
</tr>
<tr>
<td>F</td>
<td>less than 50.00</td>
</tr>
</tbody>
</table>

STUDENT RESPONSIBILITIES

Please make a reasonable attempt to arrive on time. If you must leave earlier than the scheduled end of class, please try to do so quietly and discreetly. Class disruptions or distracting behavior will not be tolerated.

You are responsible for all topics discussed in class, as well as class announcements. Although attendance is not mandatory, it is in your best interest to attend every class and absence from class does not excuse you from the above responsibilities.

You are encouraged strongly to read any material that is handed out to in a given class for the following class. If the schedule of readings changes from that posted in the second part of the syllabus below, then those changes will be announced in class. Ask for clarification on anything you find unclear, ambiguous, or unspecified. This includes both course policies and astronomical topics. Errors in this syllabus will be corrected and posted on the webpage for this course (see above).

Know the rules concerning withdrawals and incompletes, published in the UGA Undergraduate Bulletin. Note that I will NOT withdraw you from the course for excessive absences.
All students are responsible for knowing, understanding, and abiding by the academic honesty policy of the University of Georgia, which can be found online at http://honesty.uga.edu
If you have any questions about this policy and how it pertains to your work in this course, please ask me for clarification.

If you have any questions or concerns about this syllabus, please contact me.

_Tentative Class Schedule & Readings:_

Week of   Topic/Readings
January 5  – Introduction – Chapter 1; Fundamental Observations – Chapter 2
January 12 – Fundamental Observations – Chapter 2
January 19 – Newton Versus Einstein – Chapter 3
January 26 – A Little Relativity – Notes posted on website
February 2 – Cosmic Dynamics – Chapter 4
February 9 – Cosmic Horizons – Notes posted on website
**First midterm: February 10 – Ch. 1 – 3**
February 16 – Model Universes – Chapter 5
February 23 – Lambda and Quantum Mechanics – Notes posted on Website
March 1 – Model Universes – Chapter 5
March 8 – Spring Break!
March 15 – Measuring Cosmological Parameters – Chapter 6
**Second midterm: March 19 – Ch. 4 – 5**
March 22 – Measuring Cosmological Parameters – Chapter 6
March 29  – Dark Matter – Chapter 7
April 5  – The Cosmic Microwave Background – Chapter 8
April 12 – Nucleosynthesis and the Early Universe – Chapter 9
**Third midterm: April 16 – Ch. 6 – 7**
April 19  – Inflation and the Very Early Universe – Chapter 10
April 26 – Structure – Chapters 11-12
April 28 – Tuesday; Last day of class – Monday class schedule in effect
April 29  – Wednesday; Reading Day
**FINAL – Tuesday, May 5th ; noon – 3 PM – Cumulative**