

# SAMPLE SYLLABUS

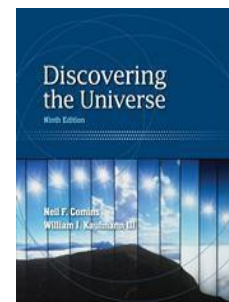
Fall 2013

## ASTR 1346, SECTION 001 (INTRODUCTORY ASTRONOMY II) STARS, GALAXIES and UNIVERSE

**Instructor:** Dr. Nilakshi (Nila) Veerabathina  
**Class Location:** Room 118, Life Science (LS), UT Arlington  
**Class Times:** Monday, Wednesday, & Friday: 11:00 - 11:50 AM

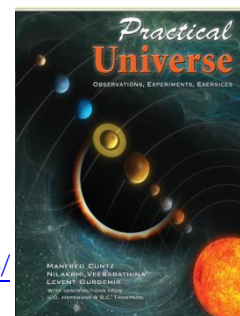
**Office Location:** Room 120 C, Science Hall (SH), UT Arlington  
**Office Hours:** Mon, Wed and Fri: 10-11 am or by appointment  
**Email:** Please use the e-mail option in Blackboard (<http://elearn.uta.edu>)  
**Mailbox:** 19059

**Reference book:** *Astronomy Today*, 7<sup>th</sup> Edition, Chaisson and McMillan, (Prentice Hall publication) *No need to purchase it.*



### Required Course Material:

- 1. Text Book:** *Discovering the Universe*, 9<sup>th</sup> Edition, Neil F. Comins and W. J. Kaufmann (W. H. Freeman and Company publication)
- 2. Lab Manual:** *Practical Universe: Observations, Experiment and, Exercises*, by Cuntz, Veerabathina, Gurdemir (Kendall/Hunt Publishing Company)  
*More information about labs is available at:* <http://www.uta.edu/physics/astrolab/>  
(Caution: Never buy a used Lab Manual as it will have missing worksheets.)



- 3. Clicker:** *iClicker 2 Classroom Response Device* (The purchase and registration information is given at the end of Page 4 of this syllabus.)



- 4. Class Slides:** The class slides will be available on <http://webct.uta.edu/> after every lecture.

### Description:

This is a one semester lecture plus laboratory course on astronomy with an emphasis on the study of the Sun as a star, measurement of different properties of stars, birth, evolution and death of stars, strange states of matter (neutron stars and black holes), Milky Way Galaxy, study of the Universe beyond our Galaxy, formation and evolution of galaxies. As we consider more distant objects, such as active galaxies and quasars, we move backwards in time, ultimately arriving at big Bang. The course finally takes you to the current cosmological ideas.

**This course may be used to satisfy the UT Arlington core curriculum requirement in life and physical sciences.**

### Learning Objectives:

On the completion of this course students should be able to

- <sup>35</sup><sub>17</sub> demonstrate the methods and the advantages of advanced technology that astronomers use to obtain information about celestial objects.
- <sup>35</sup><sub>17</sub> describe the nature of scientific research and process of science in the fields of Physics and Astronomy.
- <sup>35</sup><sub>17</sub> explain the basic concepts of Physics, such as gravity, nature of light, laws of motion and thermal radiation etc.
- <sup>35</sup><sub>17</sub> list and describe the layers of the Sun's interior and atmosphere, sunspots and analyze the effects of

Sun activities on the Earth.

- <sup>35</sup><sub>17</sub> describe the nature and evolutionary paths of stars from birth to white dwarf, neutron stars, or black holes.
- <sup>35</sup><sub>17</sub> demonstrate the properties and evolution of our galaxy, other galaxies and the entire universe, and analyze the experimental basis for the Big Bang theory of the universe.
- <sup>35</sup><sub>17</sub> discuss our place in the Universe and apply it to understand the possible existence of extra-terrestrial life in the universe.
- <sup>35</sup><sub>17</sub> develop the critical thinking, empirical and quantitative skills needed to solve scientific problems.
- <sup>35</sup><sub>17</sub> demonstrate the ability to utilize technology in a variety of forms, and express their scientific ideas in clear, logical, organized, and concise ways in both written and oral forms.
- <sup>35</sup><sub>17</sub> effectively communicate orally with small groups and in front of the class.
- <sup>35</sup><sub>17</sub> apply Astronomy and basic Physics knowledge to analyze new situations.
- <sup>35</sup><sub>17</sub> prepare to study other subjects that require on a prior knowledge of Astronomy and basic Physics.

### Prerequisites:

While there are no formal prerequisites, a familiarity with high school mathematics is needed. Although the course stands on its own, the astronomical material follows that of PHYS 1445.

### Exams and Grading:

There will be three Tests and a Final exam. Points will be allotted based on 3 best of the three Tests and the Final exam. If you are not present for a test, you will receive a zero. You will be allowed to drop the test with the lowest grade (including a test that is missed). There will be ***no makeup*** tests, except in special circumstances in which case they must be arranged in advance. Also, as this is a lab science course, *if you **do not obtain a passing grade** (60%) in your lab you **cannot** pass the course*, regardless of how well you do on your exams.

The tests and final exam are multiple choices. The final exam is ***comprehensive***. Your course grade will be determined as follows:

Tests and Final exam average: (best 3 of 4)	65%
Lab:	25%
Class participation:	10%

The grading scale would be as follows.

90-100:	A;
80-89:	B;
70-79:	C;
60-69:	D;
Less than 60:	F (Fail)

### Lab Work:

As this is a lab science course, *if you **do not obtain a passing grade** (60%) in your lab you **cannot** pass the course*, regardless of how well you do on your tests.

You will be attending lab once every week. The labs meet at different locations every week, such as Round House Planetarium, Science Hall lab rooms, or outside for the telescope night lab. Keep the lab syllabus handy to know the location for each week. In the lab you will collect and analyze data, interpret their result, and draw meaningful conclusions. In addition to weekly labs, there will also be a couple of signature assignments that you will do in teams over a period of few weeks. Signature assignments will help you to develop laboratory, problem solving, and presentation skill. A significant portion of the lab grade will be based on the completion of these assignments.

More information about the labs in general and the signature assignments is available on the lab

syllabus (attached at the end of this syllabus) and website <http://www.uta.edu/physics/astrolab/>.

### Attendance Policy:

Attendance in class is strongly recommended, since lectures will provide supplemental material that will appear on the tests. Roll call will not be taken on regular basis, but there will be several class activities, for example, **group discussions, homework and related activities, in-class writing, pop-up or before-and-after quizzes, think-pair-share** etc. that will **count towards your class participation points**.

### Additional Information:

This syllabus provides a general plan for the course; deviations may be necessary. Test dates are targets and subject to change. You have to bring **your own scantrons** (No. 882-E) for the tests and the final exam.

### Dates to remember:

Sept 2	Labor Day Holiday (No Classes)
Sept 9	Census Date
Oct 30	Last day to withdraw with an automatic grade of W
Nov 28-29	Thanksgiving Holidays (No Classes)

### Special Astronomy thrill:

Sept. 21	A marvelous show in the UTA planetarium (CPB)	Magnificent Sun
Oct. 15	An excellent show in the UTA planetarium (CPB)	Black Holes
Nov. 12	A great show in the UTA planetarium (CPB)	Wonders of Universe

### Class Schedule: (modifications may be necessary)

Dates	Lecture Topics	Chapter
Aug. 24, 27, 29, 31, Sept. 5, 7, 10	The Sun: Our Extraordinary Star, Review of some part of Light & Other Electromagnetic Radiation	<b>10, 3 &amp; 4</b>
Sept. 12, 14, 17, 19, <u>21</u> , 24	Characterizing Stars	<b>11</b>
<b>Sept. 26</b>	<b>Test 1 (Chapters 10, 11 and part of 3 &amp; 4)</b>	
Sept. 28, Oct. 1, 3, 5	Lives of Star from Birth to Middle Age	<b>12</b>
Oct. 8, 10, 12, <u>15</u>	The Deaths of Stars	<b>13</b>
Oct. 17, 19, 22, 24	Black Holes	<b>14</b>
<b>Oct. 26</b>	<b>Test 2 (Chapters 12, 13 &amp; 14)</b>	
Oct. 29, 31, Nov. 2	The Milky Way Galaxy	<b>15</b>
Nov. 5, 7, 9, <u>12</u>	Galaxies	<b>16</b>
Nov. 14, 16, 19	Quasars, Other Active Galaxies	<b>17</b>
Nov. 21, 26	Cosmology	<b>18</b>
<b>Nov 28</b>	<b>Test 3 (Chapters 15, 16, 17, &amp; 18)</b>	
Nov. 30, Dec. 3	Astrobiology	<b>19</b>
Dec. 5	Review	
<b>Dec. 12</b>	<b>Final Exam (Chapters 10 – 19) 11:00 am - 12:30 pm (Same rm 101 SH)</b>	

**Electronic Communication:**

UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at <http://www.uta.edu/oit/cs/email/mavmail.php>.

**Academic Dishonesty:**

It is the philosophy of The University of Texas at Arlington that academic dishonesty is a completely unacceptable mode of conduct and will not be tolerated in any form. All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures. Discipline may include suspension or expulsion from the University.

"Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts." (Regents' Rules and Regulations, Part One, Chapter VI, Section 3, Subsection 3.2, Subdivision 3.22)

**Student Support Services Available:**

The University of Texas at Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. These resources include tutoring, major-based learning centers, developmental education, advising and mentoring, personal counseling, and federally funded programs. For individualized referrals to resources for any reason, students may contact the Maverick Resource Hotline at 817-272-6107 or visit [www.uta.edu/resources](http://www.uta.edu/resources) for more information.

**Final Review Week:**

A period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week *unless specified in the class syllabus*. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.

**Drop Policy:**

Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance.** Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (<http://www.uta.edu/ses/fao>).

### Student Feedback Survey:

At the end of each term, students enrolled in classes categorized as lecture, seminar, or laboratory will be asked to complete an online Student Feedback Survey (SFS) about the course and how it was taught. Instructions on how to access the SFS system will be sent directly to students through MavMail approximately 10 days before the end of the term. UT Arlington's effort to solicit, gather, tabulate, and publish student feedback data is required by state law; student participation in the SFS program is voluntary.

### Americans With Disabilities Act:

The University of Texas at Arlington is on record as being committed to both the spirit and letter of federal equal opportunity legislation; reference Public Law 93112 -- The Rehabilitation Act of 1973 as amended. With the passage of new federal legislation entitled Americans with Disabilities Act - (ADA), pursuant to section 504 of The Rehabilitation Act, there is renewed focus on providing this population with the same opportunities enjoyed by all citizens.

As a faculty member, I am required by law to provide **"reasonable accommodation"** to students with disabilities, so as not to discriminate on the basis of that disability. Student responsibility primarily rests with **informing faculty at the beginning of the semester and in providing authorized documentation through designated administrative channels.**

### "iClicker 2" Purchase and Registration Instructions

**Purchase:** You can purchase the iClicker 2 remote device either from UT Arlington Bookstore <http://uta.bkstr.com> or directly from the iClickers company's website <http://www1.iclicker.com/>.

### Registration:

- <sup>35</sup><sub>17</sub> Log into Blackboard Learn and select your course (SCIE3304-001).
- <sup>35</sup><sub>17</sub> Locate and click on the **i>clicker Registration** link on the *left panel* of the course.
- <sup>35</sup><sub>17</sub> Enter your i>clicker remote ID (given at the back of your device) and click **Submit**.
- <sup>35</sup><sub>17</sub> Your clicker is all set to be used in the course. ☺



**Note:** *If you are using i>clicker for more than one course, you only need to register the clicker in one course and the registration data will automatically be applied to all of the other Blackboard courses.*

## Live by the HONOR CODE

I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence. I promise that I will submit only work that I personally create or that I contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

## ASTR1446 (ASTRONOMY II) SAMPLE LAB SYLLABUS

Lab Coordinator: James J. Davis – Science Hall 120G

Email: [James.Davis@UTA.edu](mailto:James.Davis@UTA.edu)

### Required Lab Materials

#### <sup>35</sup><sub>17</sub> Lab Manual

- “Practical Universe: Observations, Experiments, and Exercises” by M. Cuntz, N. Veerabathina, and L. Gurdemir
- Do not buy a used manual; it will be missing pages that you are required to do in class and you will receive a zero for the missing lab. Make certain all lab pages are in your book, specifically, Units 6.7, 7.1, 7.2, 7.4, 8.3, and 8.4.

#### <sup>35</sup><sub>17</sub> Scientific Calculator

- Your smart phone might be good at some things, but it really isn't a very good calculator, especially for the type of math you will see in Astronomy II. You may use it, but there are some functions at which it will inevitably fail and give you terrible answers that might wind up carrying through the rest of your work. Be sure to have a functioning scientific calculator.

### Astronomy Lab on Blackboard

All information about the labs is found on Blackboard at [elearn.uta.edu](http://elearn.uta.edu). The following documents are posted in Course Materials: pre-lab exercises; Lab Syllabus; Lab Schedule; and the Star and Constellation Sheet for summer. Grades will be posted ONLY on Blackboard and cannot be emailed.

### Signing In and Out

On-time attendance does factor into the lab grade. In order to receive full credit for the lab, make sure to sign in at the beginning of the lab session. From the time the lab is opened until the PowerPoint begins, there will be a sign-in sheet available. If you arrive after lab has begun, the sign-in sheet will no longer be out and 5 points will be deducted from the lab grade. When you are finished with the lab, hand in your work and sign the sign-out sheet which will be at the front of the room.

### Pre-lab Assignments

Pre-lab assignments are meant to give you a feeling for the type of material that will be introduced during the lab, including equations and vocabulary. Pre-lab assignments are posted as multiple choice questions on BlackBoard. They are available from the end of one lab until the very beginning of the next session's lab. The non-mandatory pre-lab exercises can be answered by reading the objective, introduction, and procedure for the related lab, and by using your textbook, *Discovering the Universe*. The score of your pre-lab will be added to the grade of your lab as extra credit.

### Location of Labs

Labs will take place in Science Hall room 122. There may also be a lab conducted in the



large planetarium, so long as scheduling conflicts don't arise during the summer. If the meeting location for a lab changes, I will make sure to send an announcement about that.

### Lab Attendance

Any missed lab will result in a zero for that week's lab assignment. There is a night time make-up lab scheduled for 9:30PM on July 25<sup>th</sup>. Each missed lab is worth about ten percent of your grade (or about an entire letter grade) so it is important that you attend each lab.

If you are aware that you will be absent from a lab due to a [University Excused Absence](#), you must notify me **a week ahead of time** and arrange to complete the lab during a different time that week. **Notification after the event voids the excused absence** as outlined in the rules and regulations for excused absences in the Undergraduate catalog. Doctor's notes are not considered to be a University Excused Absence, and will count as a missed lab. If a lab is missed, see the Missed Lab section below for your options.

### Missed Labs

At the end of each lab session, you will hand in a lab and it will be graded and corrected. If you are not present for a lab, that lab will receive a zero grade. There are no lab grades that are dropped, although the optional Night Lab, scheduled for Thursday, July 25<sup>th</sup>, may be attended to replace on missed lab. The Night Lab may not be used to make up a missed Final Exam, and a passing grade will not be earned without taking the Final Exam. The Night Lab may only make up for one missed grade. If more than one lab is missed, the additional missed labs will receive a grade of zero. For reference, each lab is worth approximately 10% of the final grade, so each missed class will lower your grade by about 10 points.

### Lab Report Requirements

Complete the pre-lab assignment by the beginning of the lab period. The pre-labs are not mandatory, but serve as extra credit.

You are required to bring the lab manual to each lab. **Hand reproductions** of the pages from the manual will not be accepted. **Photocopies** of lab pages will not be accepted. Be sure to have your lab book with you at the start of each class. If you forget your lab book, you may take notes on the lab and attempt to do it on your own. The lab will be accepted for a 25 point penalty and only if it is handed in by the beginning of the following lab meeting.

### Office Hours

When help is needed to complete a lab or if you have a particular question, you can attend my office hours from 11AM – 12PM each Wednesday or, if the time is available, you can schedule a meeting at another time. My office is in Science Hall, Room 120G.

### Grading Policy

Your lab average will be reported to your course instructor at the end of the semester.



Pass-Fail policy and the weight of your lab grade in your overall Astronomy *course* grade is up to the course instructor.

Graded lab work may exceed 100 points (if you complete the pre-labs). The sum of each lab grade multiplied by the lab weight will be the lab average.

Grades will be posted on Blackboard about one week after all labs are received. You can access Blackboard at [elearn.uta.edu](http://elearn.uta.edu). Please double-check Blackboard grades with your returned papers.

**Please keep in mind that in most cases, if you receive less than a 60% in the lab, you will receive an “Incomplete” for the entire course.**

### **Semester Assignment**

The semester assignment will give you an opportunity to more thoroughly study our closest star, the sun. Working with partners, you will use data from ground and space-based NASA and ESA observatories to study the sun's visible surface, high energy chromosphere, super-heated corona and streaming solar wind that envelops the solar system. You will learn about the solar cycles, its influence on the Earth, and see the dramatic changes the sun undergoes over the course of a decade, seeing an active sun and violent processes that are constantly occurring without your notice. You will also prepare a short presentation on a topic related to the sun, which may cover a range of topics including solar birth, death, probes, and more.

### **Academic Dishonesty and Misconduct**

Academic dishonesty may result in a grade of zero for the lab in question (including the Final Exam), expulsion for that lab, and a report to the dean of students. Academic dishonesty includes and is not limited to: copying someone's answers while “working together,” and letting someone copy your work.

A more complete description: "Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts." (Regents' Rules and Regulations, Part One, Chapter VI, Section 3, Subsection 3.2, Subdivision 3.22)

### **Student with Disabilities**

Students who need an accommodation based on disability should arrange to meet with the lab coordinator to determine what arrangements are necessary to accommodate your needs.

## Astronomy 1446 Schedule

<b>Week of</b>	<b>Lab</b>	<b>Lab Topic</b>	<b>Location</b>	<b>% of grade</b>
Jul 9	Lab 1	Introduction to Astronomy 2	Science Hall 122	3
Jul 11	Lab 2	Unit 3.2 – Spectral Analysis	Science Hall 122	10
Jul 16	Lab 3	Unit 7.1 – Parallax	Science Hall 122	10
Jul 18	Lab 4	Unit 6.7 – Exoplanetary Systems	Science Hall 122	10
Jul 23	Lab 5	Unit 8.3 – Doppler Effect	Science Hall 122	10
Jul 25	Lab 6	Unit 7.2 – HR Diagram	Science Hall 122	10
	Lab 7	Night Lab Observations – July 25	TBA	0
Jul 30	Lab 8	Unit 8.4 – Black Holes	Science Hall 122	10
Aug 1	Lab 9	Planetarium Star and Constellation Point Out	CPB Planetarium	7
Aug 6	Lab 10	Unit 7.4 – Hierarchy of Distances	Science Hall 122	10
Aug 8	Lab 11	Final Exam	Science Hall 122	20

Lab units are subject to change. Notice will be given on Blackboard

## Signature Assignment (ASTR 1446) – The Dynamic Sun

1. **Critical thinking skills** – creative thinking, innovation, inquiry, analysis, evaluation and synthesis of information

In this assignment, students will be given the task of exploring the nature of the sun, the Universe's closest and most well studied star. Students will gather solar data from an array of sources, both ground and spaced based and operating across the electromagnetic spectrum. Students will work in teams to categorize the changing nature of the sun over the period of a year, concentrating on observations of the visible light photosphere, high energy ultra violet chromosphere, and x-ray emitting corona.

Each student in the group will be responsible for a different region of the sun and illustrate how activity and changes in the sun's activity level change over time, including the frequency and power of flares, number of sunspots, and flow of the solar wind. Students will also use software to produce illustrative animations of the changing sun.

Taken together, students will relate various phenomenon visible in optical, UV, and X-ray wavelengths to tie together the way in which varied and seemingly disparate occurrences, like sunspots, flares, are related.

**Creative thinking:** Students will compile and animate images from various sources to illustrate the changing nature of the sun.

**Innovation:** Students will learn to recognize that many of the sun's dynamic aspects are invisible in the visible spectrum, and that sweeping, profound, sometimes violent changes are both predictable and occur without being readily apparent on Earth.

**Inquiry:** Students will also delve into the nature of light, and the processes by which the sun creates its energy. They will also compare past events and periods and predict how the sun may change in the years ahead.

**Analysis:** They will identify, track, and categorize features such as sunspots and flares and interpret how the two are related. Students will predict how the sun will change in the coming years based on analysis of past activity.

**Evaluation:** Students will explain the underlying process behind events, as well as assessing the size, duration, and energy involved in these events.

**Synthesis of information:** Students will combine all data into a complete picture of the sun over the course of the time period assigned, tracing the origin of events across the electromagnetic spectrum.

2. **Communication Skills:** to include effective development, interpretation and expression of ideas through written, oral and visual communication.

Together, the students will present a complete written evaluation of the sun's changes over the course of the year or solar cycle, predicting how the sun will continue to change,

as well as describing the instrument that gathered the data. The write up will tie together the frequency and location of sunspots, flares, and outflows across the sun into a complete picture of solar activity. Separately, each student will present an oral report on one of a number of different topics dealing with the sun, from its birth to its death, its natural processes, evolution, major events, and regions.

Some presentation topics dealing with the sun:

**Probes:**

SOHO, Hinode, Stereo, SDO, SNO and Super Kamiokande, IBX

**Surface Features:**

Prominences, plages and spicules, flares, coronal mass ejections, sunspots, the heliosphere

**Processes:**

Fusion, granulation, the solar wind, neutrinos, sunquakes

**Events:**

The Carrington Flare; aurora borealis; geomagnetic storms; the Little Ice Age; magnetic pole reversal; sun grazer comets and Comet Lovejoy

**Past, Present, and Future:**

The young, dim sun; the sun in 1 billion years; the sun in 5 billion years; the planetary nebula sun; the white dwarf sun