

870:010 ASTRONOMY

Section 2

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What's this course about? This course is about science, specifically astronomy. You will learn how science is done through immersion into one particular field of study. In general most of you are taking this course to fulfill your Liberal Arts Core requirements, and you aren't likely to become professional astronomers. Hopefully you'll learn enough to be able to impress your friends and family with your familiarity with the night sky, astound them with your insight into the scientific theories that explain the Universe and all parts of it, and come away from this course with an appreciation of just how really cool this stuff is. But that's just my opinion.

What do I need to get from the bookstore? You'll need only one item – a pack of **3x5 index cards**, preferably with lines in them. You'll need these during the semester during lecture (keep reading and you'll find out why). If you don't already have one, you'll also need a scientific calculator.

What about a textbook? As you are well aware, textbook prices are obscene, and you may not even look at an assigned textbook. In the field of astronomy, new discoveries are being made, literally, every day, which apparently gives book sellers the justification they need to put out new, more expensive copies of textbooks. This is just plain wrong. All of the course material that you will need, including this **syllabus, assignments, sample tests, observatory visit information, test study sheets, useful links, and full lecture notes are available on the website listed at the top of the page**. The web material should be treated as your textbook, since that is basically what it is – if you printed out all of the notes it comes out to around 500 pages. *You are responsible for knowing the material in the notes that are available on-line as well information given in the lecture for the tests.*

Do I need to come to lecture? YES! You should come to the lecture, as a way to gain insight into the material, something you don't always get just by reading the on-line material. You will probably want to take your own class notes, but as with any class that you want to do well in (are there any that you don't want to do well in?), you should always attend lecture. The lecture will help clarify things, especially by giving you the opportunity to ask questions about the material, upcoming tests and homework. And as you'll see, if you miss lectures, your grade will suffer.

What if I do miss class? I haven't yet figured out why students would willingly miss a class (skip), but there are some interesting ramifications for those that do. In general, skipping class results in a lower grade and it pretty much defeats the purpose of getting an education. To encourage you to attend class, you will lose points for missing class. Here's the scale –

3 or fewer unexcused absences – no penalty

4-9 unexcused absences – loss of 3 x absences points (e.g., 6 absences=18 points lost)

10 or more unexcused absences – F for the course

Note that the above says “unexcused” absences. If you have a legitimate reason to be gone, you must provide me with **prior** notification of your absence. This is usually a letter from your coach, teacher, advisor, etc, concerning your absence. Only university sponsored or related absences are excusable. Medical absences will require a note from the Student Health Center or your personal physician to be excused.

What are the readings? How much do we need to cover for a test? There is no specific schedule for the readings, since I tend to just lecture until I get to a convenient stopping place. But I do follow the order of the material in the on-line notes. The course is divided up into 4 parts, each lasting about 4 weeks (one part is only 3 weeks). At the end of these parts there will be a test that covers the material in that section of the course. Here is a breakdown of each part of the course –

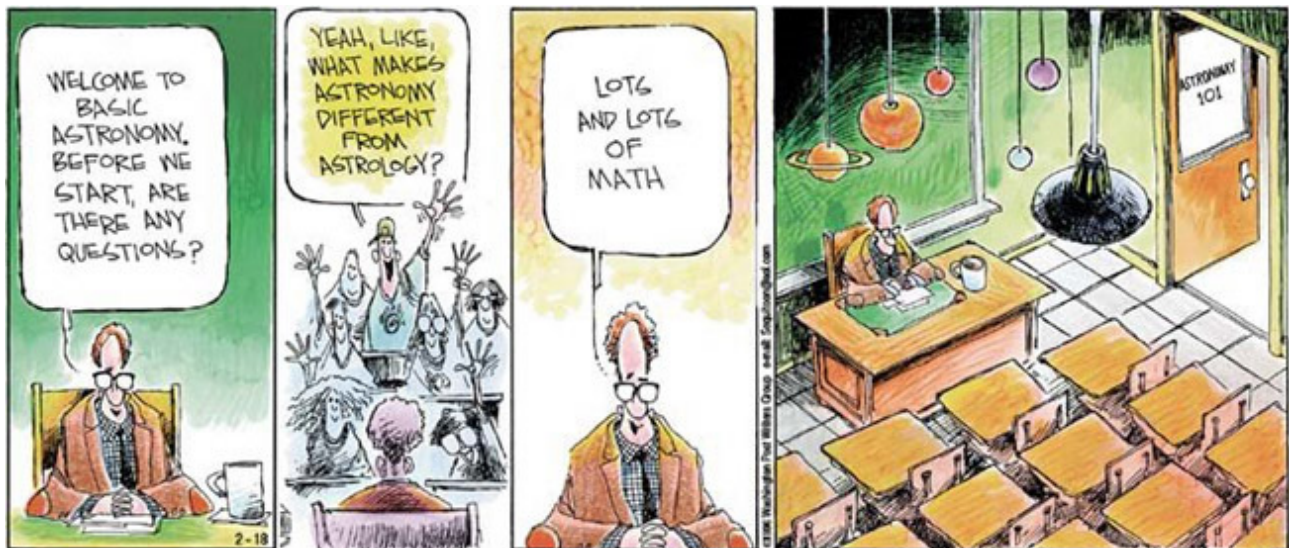
Part I. Background principles - simple observations of the sky, history of astronomy, physics of motion, principles of gravity, light and telescopes.

Part II. Stars - the Sun, stellar birth, characteristics of stars, stellar evolution, stellar death.

Part III. Galaxies and more - the Milky Way Galaxy, other galaxies, clusters of galaxies, the Universe and its fate.

Part IV. Solar System - Planets, moons, comets, asteroids, and other loose ends.

As previously stated, you’ll be responsible for all of the notes that are on the website and anything covered in lecture.



What’s that cartoon have to do with anything? This is a science course. You will have to use math to do many of the homework assignments. You should have a *scientific* calculator. This would be one that has an exponential button (something labeled EE or EXP), and a Log key. If you do not currently own one, you can get one for about 10 bucks at most discount stores or one of the office supply store. There will be a few math problems on the tests as well so you’ll want to have a calculator handy for those.

Is math the only thing that I'll have to be concerned about? No. This is also a Liberal Arts Core (LAC) course, so your assignments will also be graded on non-astronomical things like punctuation, grammar and spelling. Tests won't be under as much scrutiny since you don't have the time to check your grammar and your mind may be on other matters.

What homework will there be in this course? There will be 5 homework assignments over the first 3 parts of the course. For the last part of the course (the "Planets" section), you'll be doing something different – just keep reading. All of the homework assignments and material needed to complete them are posted at the course website. Due dates are given on each assignment, and each assignment must be turned in at the start of class on the date indicated. There will be a penalty for late assignments regardless of the excuse and no credit will be given for assignments turned in after assignments are graded and handed back, again regardless of the excuse. And, as if you haven't heard this before, make sure you do your homework well before the due date – waiting until the last minute does not help your grade. Some of these assignments require access to a computer, and if you can't get computer access on the morning the assignment is due, then you'll be out of luck. If you have problems with the homework, please contact me as soon as possible. I will be more than happy to assist you. There will be help sessions set up to help students in all Earth Science courses, so you can also get help at those times.

What is the project that I'll do in the last part of the course? You'll be developing a website on your impressions of astronomical topics using the UNI e-Portfolio system. This is a way to record your academic achievements at UNI and provide access to potential employers and academic advisers about your accomplishments. Some majors at UNI require their students to use the e-Portfolio system to provide examples of their work, and as a way to track student accomplishments. For this course you'll be creating a website with astronomical news items which you need to find, and providing information about them, as well as a rather open ended item. The project will be worth as much as an entire test (40 points), so it is a large fraction of your course grade. Information on this is provided in a separate handout.

Do we ever get to go to the observatory? Certainly! As part of your grade, you will need to visit the McCollum Science Hall observatory. Details are in a separate handout, which also has information about *when* you should visit the observatory. To avoid the problems that come when everyone waits until the very end of the semester to go to the observatory, you are assigned a particular week to go to the observatory.

Will we learn about stars in the sky and the constellations? You will, but that's not what this course is only about. There will be two quizzes during the semester about constellations and the objects contained within them. Almost every week I will go over some constellations and the objects in them. I will hand out the list of items that you will need to know for the constellation quizzes along with maps of the sky that you can mark. The quizzes are scheduled for **October 16** and **December 11**, and they will take only about 10 minutes.

What about tests? All tests will be offered over through UNI e-Learning. This is the on-line course utility system available at UNI. There is a link to it from the astronomy course website. If you have never used an on-line learning system before, you can take free workshops that will show you how it works (again – link on the course website). Tests will need to be completed by the

following deadlines –

Test 1 – Sunday, September 20, 10 PM

Test 2 – Sunday, October 18, 10 PM

Test 3 – Sunday November 8, 10 PM

Test 4 – Thursday, December 17, 10 PM

Since you can take the tests pretty much any time you want over a roughly 2 week period, there is really no excuse for missing one. However, emergencies or unusual situations can arise. If something does happen that prevents you from taking the test during the time that it is available, you must contact me as soon as possible. If you do not want to take the test in an on-line format, but would prefer to have an old “pencil and paper” type of test, that can also be arranged.

Each of the exams has equal weight and will have 40 points worth of questions. The exam format consists of the following - 10 fill-in the blank questions, 20 multiple choice questions and 10 points for something else which could be essays, matching or something I haven't even thought of yet. Material covered in the lecture and the web notes are the only sources for the exam questions. Each exam is timed (60 minutes), and you can go over the time limit a little bit, but if you go over the time limit excessively, you'll lose points.

I would *strongly* advise you to carefully read the material on the web before the tests and go over your course notes thoroughly. Remember, the course website is just like a regular text book, and you are responsible for the material there. **I can not cover everything in lecture that is in the website notes, so you need to know the on-line material as well!!!!** Also many of the questions are written in a manner that requires you to come up with the answer by using your thinking skills, not just by looking things up. This is particularly true for the first two tests. As you'll learn, my tests really suck - they are very difficult so coming to them unprepared will just put you in a bad position. Fortunately the exams are not comprehensive, but only cover the material for that part of the course. This does not mean that you should completely dump everything out of your brain after one of the tests. It will be of use later on in the course, especially the material covered during the first 4 weeks. Study sheets and practice tests are available at the regular course website.

What other things go into the course grade? For some odd reason, students see no problem with skipping classes. I haven't yet figured out why, but there are some interesting ramifications for those that do skip out. Skipping class results in a lower grade and it pretty much defeats the purpose of getting an education. To encourage you to attend class and to help your learning, there will be **mini-quizzes** that will be randomly given during the semester. There will be 20 of these and each is worth 5 points. This is where you'll need the **3x5 index cards**. All quizzes will use those, so make sure you get a pack of index cards at the bookstore. No other index card sizes or types of papers will be accepted for credit. Since it is a quiz, there will always be a correct answer, and you'll need to provide it to get full credit (up to 5 points). If you put down a wrong answer for the quiz, you'll still get 2 points just for being in class and making an effort. So it really does pay to attend class. **If you miss 10 quizzes due to unexcused absences, you will fail the course.**

Can I work with my friends on things for the class? In general, people learn best from their peers (friends, fellow students), so I would encourage you to buddy up with some people in class and work on homeworks together. However, do not turn in homeworks which contain material copied from your classmates, a website, a book, etc., – this is *plagiarism*. You can not take credit

for the work of others, and any work that even hints at plagiarism will be given no credit. If you are uncertain as to what plagiarism actually is, there is a link at the course website – you may be surprised to see what constitutes plagiarism.

How do I figure out my grade? The breakdown for your grade is as follows - 160 total points for the exams, 110 total points for the homework, 40 for the e-Portfolio project, 100 total points for the mini-quizzes, 40 total points for the constellation quizzes, and 50 points for the observatory visit. This gives a total of 500 possible points. Your final grade is based on a percentage scale, so there is no actual “curve” in the traditional sense of the word. The distribution is shown below –

Percentage	0-51	52-55	56-59	60-63	64-67	68-71	72-75	76-79	80-83	84-87	88-91	92-100
Grade	F	D-	D	D+	C-	C	C+	B-	B	B+	A-	A

I will use the grade book utility on e-Learning to provide you with an up-to-date calculation of your grade after each test. This way you’ll be able to determine how well things are going throughout the semester.

How do I get in touch with you? If you need to get in touch with me, and I am not in my office, then the preferred method is e-mail. Since I get *a lot* of Spam, please put in the subject line of your message something about astronomy, like “Astro class question” or something like that – do not leave the subject line blank! If my Spam filter does label your message as Spam, at least I’ll be able to pick it out of the Spam box. Messages with blank subject lines may be deleted unread. Even though I might not be in my office many times during the day, I am usually somewhere around campus, so I’ll eventually get your message. You can also try AIM, though I might not be able to respond immediately.

Will I get a chance to earn some extra credit? Yes, there will be extra credit opportunities available. These will only be announced in lecture.

What *shouldn't* I do? Do not bring food or drink (excluding water) into Latham 125. If you do this, it will result in the loss of points. Also please have the courtesy to turn off your cell-phones – failure to do so will result in the loss of points. Also do have the courtesy to pay attention during lecture and avoid playing with your cell-phone or iPod or whatever current toy students have. Such activity is not only discourteous and disruptive to others, but also will result in the loss of points.

In compliance with the University of Northern Iowa policy and equal access laws, I am available to discuss appropriate academic accommodations that may be required for students with disabilities. Requests for academic accommodations are to be made during the first three weeks of the semester, except for unusual circumstances, so arrangements can be made. Students are encouraged to register with Office of Disability Services, 103 Student Health Center, to verify their eligibility for appropriate accommodations.

The Liberal Arts Core - Category 4: Natural Science and Technology

Courses in natural science promote an understanding of science as a human process that investigates matter and energy acting within complex organic and inorganic systems. Fundamental principles of both physical and life sciences are included.

Purpose for Category 4: Natural Science and Technology

In a highly technological society, science plays an enormous role in how things are done and how we view and come to understand the natural world around us. Through the activities of science, humans have learned to control certain aspects of their environment, have produced understandings with great promise for the future, and have unleashed posers that threaten to end all civilization. Issues of great political, social, and religious significance have arisen from the scientific endeavor. To develop an informed awareness of the interconnectedness of all aspects of the human and natural environments and the forces that operate in nature and society, students must understand science, how it operates, its inherent values, its limits, and its credibility. Since it is impossible to separate the process of science from the body of knowledge generated by this process, principles, concepts, and factual material of selected disciplines must also be part of the Liberal Arts Core.

The content of the natural science component of the Liberal Arts Core should assure that students learn the following:

1. Science is a process of learning about the universe and consists of more than the collection of information in textbooks.
2. The formulation of testable hypotheses which can be supported or refuted by evidence is a necessary part of the scientific process.
3. Science has validity and merit within the limits in which it operates and is quite different from the pseudoscience which has been offered to the public in recent years.
4. Modes of thinking in the sciences include the use of classification schemes, the collection and analysis of numerical data in many forms, the skeptical approach to all tentative conclusions, a creative imagination, and an understanding of the difference between observation and inference.
5. The process of science is not conducted in a vacuum, but rather, by humans who have all the characteristics of other humans and who live in societies largely governed by non-scientific influences. The scientific enterprise is intimately connected to all other human activities.
6. There is a relationship between science and technology, and these entities interact with the larger society.

Within these courses, the students should have at least one laboratory experience.