

Astro 230 The Science and Fiction of Planetary Systems Spring 2022

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Lecture: Wednesdays 9 am

Discussions: M/W/Fri 11 am and 12 noon

[T]here is an infinite field, a containing space which doth embrace and interpenetrate the whole. In it is an infinity of bodies similar to our own. No one of these more than another is in the centre of the universe, for the universe is infinite and therefore without centre or limit....[T]here are certain determined definite centres, namely, the suns, fiery bodies around which revolve all planets, earths and waters, even as we see the seven wandering planets take their course around our sun.... Thus there is not merely one world, one earth, one sun, but as many worlds as we see bright lights around us, which are neither more nor less in one heaven, one space, one containing sphere than is this our world in one containing universe, one space or one heaven.

- Third Dialogue of *On the Infinite Universe and Worlds* Giordano Bruno, 1584

By now, you have probably seen/read at least one science fiction movie/story which raised your suspicions that either the authors/creators had 1) a limited budget or 2) a limited imagination for portraying an alien world. Scientists have collected enough data within our own solar system and in stellar systems around us in our portion of the Milky Way to infer that there is a great variety in planet types and parameters, some of which may plausibly contain life. But it's a far cry to assume that all that life swims, flies or breathes through a 21% oxygen atmosphere on a planet with "1 " of gravity and ~75% of its surface covered in liquid water. In fact, it's questionable that every stellar system with planets even involves life.

THIS IS A DIFFICULT COURSE. There is a recurring myth that "I courses" are "easy A's" - you can look up the grade distribution history of this (and many) UMD classes and decide for yourself. While this course is intended primarily for non-majors (i.e., **not** majoring in Astronomy or Physics) and there are no prerequisites (beyond college algebra) there is no doubt that previous knowledge (at a solid high school level) will help greatly as this course is interdisciplinary. **We require the CORE Distributive Studies Requirement in Mathematics.** We will use basic algebra in this course (*especially* in the first two sections) and a lot of physical reasoning and some basic chemistry and biology. However, this class is *wide* in its scope, not deep. You *must work through* the discussions! This is where most of the learning will start and where you will wrestle with the material.

Learning Outcomes

This interdisciplinary [I course](#) will lay the foundation for understanding how planets function in stellar systems by examining the plausibility of planets used in science fiction regarding their physical, chemical and biological qualities. We will also consider the possibility of terraforming other planets, including within our own Solar System. To critically investigating fictional environments, we will introduce the necessary general astronomy, physics, chemistry and biology to learn:

- how terrestrial and jovian planets and moons migrate and affect each other;
- what their surfaces and atmospheres would be like under a variety of conditions (proximity to their star, chemistry, gravity, stability of rings, crater formation rate, etc.);
- how those characteristics change over geologic time;
- how plausible is it for humans to engineer planets for our use ("terraforming");
- how easy or hard it is for life to form, evolve, and survive catastrophes; and
- how likely intelligent life might be.

Students will also develop a specific toolkit which includes understanding how equations can tell you the *relative* behavior of real quantities without necessarily resorting to "plug and grind" arithmetic. Some students who are wary or weary of math may find this the hardest challenge, especially on [tests](#) where this toolkit can only save valuable time if you know how to use it correctly.

By the end of this semester, I trust you will have developed that suspicion into a well-honed analytical skepticism based on a solid foundation of scientific understanding. So the next time you see a movie, read a book, etc., you'll suspend your disbelief only so far and no further (how much is up to you, but at least you'll know!).

We will see multiple examples of imagined worlds and creatures, many familiar through popular culture as well as the general science fiction canon. As the semester progresses, you will develop a host of specific analytic skills using what we know about real planets, moons, asteroids and comets. As the astronomy community (especially the [Kepler](#) mission and now, the [TESS](#) mission) releases recently acquired observations of real exoplanets, a better understanding will emerge of how archetypal (or not) our own Solar System actually is.

You will be placed randomly in a group of about six people in your mandatory discussion section to practice this critical examination style via small, graded, group assignments leading to a larger group project. Toward the end of the semester, we will also discuss the needs and plausibility of terraforming various Solar System candidates (Mars, Europa, etc.). In the last part of the semester this new knowledge will be applied in group work by the groups to *design* their own semi-fictional stellar system, including at least one terraformed object.

Syllabus

Buckle up. This is the longest page on the website. And you *do* need to read it. This class is a marathon, not a sprint. Cramming is a strategy for crashing and burning. *For "Learning Outcomes," see the [Home Page](#)*

Class Structure

Don't forget to check out the [Navigation](#) page. This class is organized into 5 units; the assignments are structured in due date order and can be found in [Modules](#). You can also look at the [Lecture Schedule](#) for all kinds of relevant, inspiring, and useful information for each unit. Here is a quick overview:

- The first four units ("Gravity," "Flux," "Chemistry," "Biology") are each three weeks long. The last unit ("Terraforming") is only about two weeks long.
- There are 10 Wednesday morning lectures. Our first lecture of the semester is general overview and class culture - not to be missed; each unit has two content lectures except the last one (which has one content lecture).
- There are 42 discussions - three per week MWF; the five units have 9, 9, 9, 9 and 6 discussions respectively (the last Monday discussion is tied to project presentations)
- The first four units have a test during Wednesday morning lecture (in the middle of the first week of the *following* unit). The last unit (Terraforming) does *not* have a test.
- There is no final exam. Your group project is the summative assessment for this class.

Grading

You are **STRONGLY** encouraged to keep track of your grades here on ELMS as assignments get graded on this point scale. You are also **STRONGLY** encouraged **NOT TO PANIC**. Given the value of each test by itself (each one is only 10% of your grade and I drop your lowest test), it is very misleading to focus too much on one test score as an indication of how you are doing in class. The tests are difficult and you should aim to do your best, but they are not given actual grades, only point scores.

ASSIGNMENT	Discussion Participation	Tests (4 minus 1)	Final Project	Lecture Participation	Total
POINTS	400 (40%)	300 (30%)	200 (20%)	100 (10%)	1000 (100%)

And here is a **rough** guide as to how your points relate to your final grade:

Course Total	900-1000	800-899	680-799	550-679	0-549
Percentage	90%-100%	80%-89.9%	68%-79.9%	55%-67.9%	0%-54.9%
Letter Grade	A	B	C	D	F

Letter grades will be assigned based upon your cumulative score, and I rarely curve dramatically. Having taught for over a decade, I find these grading guidelines about right. I reserve the right to adjust based on class averages. However, any adjustment will make it *easier* to get a higher grade, never more difficult. Missing the lecture participation quizzes can drop your grade a **whole letter**. So **DON'T SKIP THE LECTURES OR THE PARTICIPATION QUIZZES!** (see more below)

The point scale makes it possible for everyone in the class to do well; e.g., if everyone scores above 80% in the course, you would all receive either a B or better letter grade; the entire class could potentially get A's (unlikely, but possible). I **will** be using +/- modifiers for the final grade. Past experience has shown my assignments and tests are pitched about right: the average total score in the class is ~80% range of points, i.e., the B/B- range.

A word on regrades for discussions or tests. Neither my graders nor I are perfect when assessing your answers (shocking!). If you think we have erred, you have **one week from the date grades are released** to email us with a short note explaining what you think we got wrong and for which question. We will review (in our own time) and change the grade (if we agree) or not by the last day of lecture (or the last day of finals week in the case of the last discussions).

Lecture Participation

(or "Why did you have me buy this silly clicker?")

A TurningPoint account is required. Check with the bookstore: you should already have one as a UMD student. You can use the app on your phone (free) or get the physical clicker (may cost \$) or do both, but you **must register correctly**. See [this page for more information \(Links to an external site.\)](#) and also consider clicking Clickers on the left menu. Be forewarned that laptops are not allowed in lecture (see [below](#)) unless specifically dictated by a DSS form.

This class has lots of students; each of you brings your unique perspective which is often worth sharing (right or wrong!) with your neighbors and classmates. Learning is more effective when you try to persuade your neighbors (and yourself) by explaining what you know so far. Your clicker responses give me immediate feedback on how well the material is understood by how many students. This allows me to go over difficult material sufficiently and to move on only when comprehension has become nearly universal. You WILL NOT BE graded on the accuracy of your clicker responses, only docked half the points from your Participation Quiz score (below) if you fail to respond to more than half the questions on a given day. If you answer none of the clicker questions, your Participation Quiz will receive a zero.

"Oooh, I just figured out I can answer some questions from my app while playing video games back in my dorm room!" Alas, this happened in my class once. It was quickly obvious that more people were answering clicker questions in class than were actually there. It was also easy to figure out after lecture who they were. Alas, their names were submitted to the Office of Student Conduct and this was put on their academic record as an academic integrity violation. Don't join them in this ignominy for a measly few points; their grades ended up suffering MUCH more than if they had been honest. Want to stay in bed or play video games (or both)? Go ahead - you're adults and can make those choices. But be honest and own it.

Within a few weeks, I will actually know many of your names and faces (and even both at the same time!). Do not attempt to game the system. The official University policy on how to deal with excused absences can be found in [UMD's Course Related Policies \(Links to an external site.\)](#). In addition, the Department of Astronomy also has an [attendance policy](#) download. Note the required advanced warning to the instructor if you plan on missing class due to religious

observances or scheduled surgeries, etc. If you do have to miss a lecture be sure to look at another student's notes and make sure that you understand what was covered or come to [office hours](#). Excused absences receive an exemption from that particular lecture's clicker points. If you are clickerless at first, within the schedule adjustment period only, you may let me know that you are there after class to avoid losing participation points.

The first bit of participation grade involves:

- finish reading this syllabus page;
- answering the assignment "Sign syllabus" on ELMS

Then, assuming you answer at least half of the clicker questions, to actually receive participation credit, take the relevant [Quiz](#) by midnight of the day of the lecture (exception for the first two weeks of class only: you'll have until midnight the *following* day). If you answer 50% or more correctly you will receive 100% credit = 8 points. Answering everything (right or wrong) will at least give you 50% credit = 4 points. Without prior arrangement, there is no way to make up missed lecture participation quizzes. (If you add the class late, please let us know so we can exempt you from the quizzes you missed.) **Your initial score from ELMS is meaningless** - I need to adjust it to the 0, 4 (50%), or 8 (100%) point values in post-production. Note, it *does not matter* what the quiz seems initially worth (e.g., 8 pts, 11 pts, etc. based on the number of questions) - the final scores will be 0, 4 or 8 points.

Again, the final score will be further marked to 0 if you did not actually use your clicker in class or half of your quiz score (0, 2, 4) if you answered fewer than half of the clicker questions.

Discussion Section

THIS IS THE HEART OF THE CLASS. It's crucial that you stay on top of the discussions - there are usually three per week (more than 40 throughout the semester!) and each one is full of unique challenges and questions. There will be a pdf of questions found in the relevant [Module](#) assignment, available on or before the dates on the [Lecture Schedule](#); download it and be ready at the section time to work with your group. **BE THERE** in Discussion! No discussions will be recorded (though we can go over what you missed in office hours). To receive discussion participation credit, submit a pdf of your answers **as individuals** in the relative [Module](#) assignment. While, obviously, actual discussion amongst your group is **STRONGLY** encouraged, **put your answers and your math in your own words and symbols (you are NOT graded on how pretty your math typesetting is, but don't skip steps and try to be clear)**. Show every thought and step or lose points. Each one is graded primarily on blood, sweat and tears, not correctness, though that should still be your aim. People who submit answers but skip the actual discussion without prior arrangement may receive zero points. Please be aware of the due dates and times! **Most discussion answers are due by the evening of the day those discussions are held.**

Your discussion section assignments are on Mondays, Wednesdays, and Fridays and start RIGHT AWAY Monday January 24th even though the first lecture is January 26th! Unlike lectures, which mainly serve to expose you to the material and warn you about common

misconceptions, discussion section is where you work with the material to make sense of it all! Education research has made it clear that full comprehension does not take place in the lecture (**of any class, let alone this one!**). With the help of the TA (and sometimes the professor), you will work through examples and arguments regarding planets real, imagined by us, or in the science fiction canon. These will prepare you for the tests and eventually, your final project.

Consequently, the discussion section part of the class is required. Full points are fairly easily earned in each discussion section: blood, sweat, and tears on each question count far more than just getting the answer "right." But, before each test and the final project you need to understand **where you made mistakes** (by asking us directly during discussions, using the [Discussions](#) board on ELMS, or using [office hours](#)). The last discussion in each unit is generally review for the unit test and requires your group to create a google doc (from which you can study!). **You will NOT be given solution sets**, though usually we let you know if you bombed an answer, and we will gladly work through the problems again with you in [office hours](#) or on the ELMS [discussion board](#).

Although you are working in groups, the final write-ups for discussion sheets **must be in your own words. Copying directly, copying from a book without citing, or allowing a friend to copy is academic dishonesty and will not be tolerated in this class, and you may receive an "XF" on your transcript.** If you consult a reference other than the course text, **including websites**, please acknowledge or cite it (I don't care about the citation format, just be honest, thorough, and clear!). (See [UMD's Course Related Policies](#).) Every effort will be made to "grade" your discussion sheets quickly.

If you have to miss a discussion section deadline due to a VALID EXCUSE as outlined in [UMD's Course Related Policies](#) and our [Astronomy Department policy](#), AND you have sufficiently warned the TA **and me**, you can earn an "exemption" by fully answering the worksheet questions for the missed discussion. Your grade for that day will be an "exempt" (rather than a zero) and will not count toward your final grade. In any case, your lowest three discussion grades will be dropped (out of over forty discussions) **except for the Unit 5 Discussion "Calculations" (stay tuned later this semester)** - that can't be "dropped" and may be worth twice the usual number of points.

Tests

A single midterm is a travesty of assessment; this class covers too many topics. There will be four unit tests. These are closed book with no notes and no calculators allowed (nor, as you'll discover, are they necessary). You'll be given the entire lecture time to take the test.

Each test will consist of 30-40% short answer questions (e.g., T/F or multiple choice, short definition, image identification, etc.) and 60-70% longer questions with multiple parts. These tests are incremental (i.e., non-cumulative) checkups on how well you have learned the material in that unit. The [Lecture Schedule](#) (periodically check for updates!) shows what material will be covered on each test. If, for whatever reason, the University is **officially** closed on the test date, the test date shifts to the next discussion or lecture date.

Tests will be during a 9 am lecture the week after that Unit ends - see the [Lecture Schedule](#). Plan for those days accordingly!

PLEASE NOTE that many of the questions on the tests will NOT be exactly the same as the discussion questions but will challenge your comprehension of the material. They will be graded as quickly as possible.

Rubrics: you will often get letters ("A", "X", "B", "M", "W", etc.) next to your answers indicating a categorical error. This allows us to grade quickly *and fairly* and allows you to look up *why* you lost a point (or two) rather than having to track down me or TAs during office hours (though you can do that too, of course). A specific rubric will be posted on ELMS in [Modules](#) after each exam is graded indicating what the letters mean. I will also post a graph showing the class distribution. **Tests are not given "grades" *per se*** and each test is only worth 10% of your overall grade. At the end of the semester, your lowest test score will be dropped, so DON'T PANIC!

The final project (see below) is in lieu of a final exam.

DSS students, see [§ Disability Accommodation](#) below. Also [UMD's Course Related Policies](#), but also contact me if you feel your accommodations will not be met by this test structure.

Missed Test Policy

If you are not able to take a test due to a VALID EXCUSE as outlined in [UMD's Course Related Policies](#) and our [Astronomy Department policy](#), and you wish to take a full credit make-up test (which, despite my best efforts, may be slightly harder than the original test), you must:

- contact me by email or phone **before** you miss the regularly scheduled test if physically possible; **and**
- **submit a valid written excuse for your absence within one week after the regularly-scheduled test (by email, or even US Postal mail if necessary!).**

There is rarely an excuse for not being able to at least email me by the test start time. If you oversleep, too bad. If you have a cold and don't contact me **prior** to the start time, too bad. Serious illnesses are the exception, of course. And remember, if you're more than 10 minutes late I may refuse to let you take the test at that time (see above). When possible, **makeup tests for Wednesday tests will only be scheduled for Friday of the same week; for tests scheduled on Mondays (there are none in the Spring), makeup tests will only be scheduled for Tuesday of the same week.**

Homework Assignments?

Shocking as it may seem, there is no officially graded homework in this class. However, you should go over your discussion question answers with a fine-toothed comb, preferably with a classmate in your group, and bring your confusion and reworked problems to [office hours](#) or discussion (especially the last discussion of each unit). There, we will iron out your confusion as

much as possible and build your confidence for the tests and final project. And as always, I encourage you to use the [Discussions](#) feature on ELMS to bring up lingering questions.

Remember, even when you get full points on a discussion, it does NOT mean you got all the questions right!

Final Project

You will be put in groups almost immediately during your discussion section. The end goal of the semester is a large final project for which the group will share responsibility:

Design your own stellar system!

This final project class is in lieu of a standard final exam. Working in groups can be a thorny process, and you are encouraged to bring all group dynamics issues to me or the TAs the minute they arise (rather than telling us at the end of the semester!).

Your group will pick a real, known star and describe an imaginary planetary system around that star. If we know of any planets there you must include them, but you are not limited to that list only (within reason)! [Note: planetary discoveries around your star announced late in the semester that interfere with your narrative will not count against you, but please try to include them if you can.] More details will be given in class. See [Project page](#) for the specific grading rubric. There will be a short, densely packed group paper with room for highly speculative fiction (!) and a group presentation due at the end of the semester.

A lot of the groundwork for your project will be started in discussion section, so don't panic!

Some expectations will be covered during lecture, and some underlying issues will be worked on during discussion, but the write-up of the paper and the preparation of the (brief!) presentation will be on your own time outside of discussions and lecture.

Start a "<Group name> has a question" discussion thread in the main [Discussions](#) page to post specific questions about your project and the TAs and I will track them and make sure your questions get answered.

Attendance is mandatory for the presentations; besides it will be great fun to experience each other's projects!

If there are more than 12 groups at the end of the semester (and there usually are), we may have a few groups present on the last day of discussion - more on that decision MUCH later in the semester.

Extra Credit?

There will be no extra credit. Why make more work for you AND us?

Course Expectations (and Suggestions!)

This class is a marathon not a sprint. You will do best by keeping on top of the weekly incremental work and avoid true "cramming."

Show up! You are expected to try to attend all lectures, and your grade depends (weakly and weekly) on participation. Pure "lecturing" is the only the first step (that's why we have discussion section), but it is an important step. IRL, the lectures give you the chance to interact with students and ask questions: i.e., to be an active participant in your learning, not a passive, "empty vessel" awaiting the "brilliant" words of the professor to fill your head with knowledge - believe me, you'll be waiting a long time if you think that's the case (true for all your classes). Working with your group and challenging the lecturer and TAs whenever you are confused will do wonders for your learning. Your intelligence needs to *chew* on the information for a while and attempt to apply it in some way to actually learn. This is ESPECIALLY true of the discussion sections in this class.

The lectures will impart important clues and caveats, especially if you don't understand the text. Demonstrations, pictures, video, and even just vocal emphasis can often get an explanation across far better than diagrams or text in a book. And heck, if you do understand everything, you'll have opportunities to share your unique perspective during lecture with the people around you. All that said, I try to run a fun class and crack jokes (sometimes even good ones) to keep the tension low and your spirits high. Looking over years of course evaluations, most people seem to like the tone of the class, but a few evaluations claim I don't show respect to students. I am puzzled by this because I really do respect your enthusiasm and drive. If at some point you believe I am out of line, please either 1) let me know as soon as possible or 2) report it to the astronomy department (anonymously if you like) so they can tell me. Berating me on the course evaluation generally leaves me scratching my head (what did I say?), and never really gives me the chance to make amends, apologize (or possibly explain).

Preparation: I expect you to be prepared to work. You will get more out of the participation during lecture if you preview any reading assignments (listed in the [Lecture Schedule](#) and updated during the semester). You'll also be more aware of what you don't understand and can come to class with useful questions. (Note that we don't follow the textbook that closely and for at least one unit (Life) we don't even have a textbook!)

I rarely expect the text materials to make perfect sense the first time you read them. Nonetheless, reading beforehand may help the lectures bring it home. A more careful second reading is recommended after lecture. I STRONGLY encourage you to ask questions in class IRL, during [office hours](#), and on the ELMS [Discussions](#) for our class. The only dumb question is "Why didn't I ask in class when I had the chance?"

Study Habits: A HUGE mistake made by many students (especially frosh?) is to misjudge how much time they need to study *outside* of class.

According to time-use surveys analyzed by professors Philip Babcock, at the University of California Santa Barbara, and Mindy Marks, at the University of California Riverside, the

average student at a four-year college in 1961 studied about 24 hours a week. Today's average student hits the books for just 14 hours.

-- [Boston Globe, 4 July 2010](#)

"So, what?" you ask, "maybe we're more efficient than you old fogies were. We can multitask!" Alas, that argument belies itself. Although [this Colorado State weblog](#) focuses on student "multitasking" in class, it's not hard to extrapolate how effective multitasking is in general (it's not).

"Ok, you grumpy old man," I hear you cry, "how many hours should I really be working?" There is a decent rough calculation for how much time you should spend working based on the arcane 20th century idea of a ~40-45 hour workweek. Note that the number of "credits" for a class very roughly corresponds only to the number of hours spent arse-in-chair in lecture, so if a 15 credit semester is roughly a full load, only 15 of those hours pre week are spent in lecture/discussion. For a full workweek, each credit corresponds to about 3 hours of work/week (20 credits means 60 hours which is why those kinds of course loads are frowned on!) If you're taking five three credit classes, each class should use up ~9 hours/week on average. Obviously, some weeks are heavier than others. Since, for most classes you're only *inside* class for about 3 hours/week, this means you should be spending **about 5-6 hours per week per class outside the lecture/discussions**. That should be a mixture of discussions with your colleagues, professors and TAs, wrestling with calculations and concepts, and reading. If you rely on cramming the night before any test, you are not likely to do well. It is better (and easier) if you keep up with the material on a nearly daily basis.

Discussions! Usually the best way to understand something (or check that your understanding is correct!) is to try to explain it to someone else. I encourage collaboration (but not plagiarism!) and discussion inside and outside class. PLEASE ask for help when you need it. If you have questions, please see me in [Office Hours](#) and/or post them on the ELMS [Discussions](#) (not to be confused with our IRL discussion sections!). I track the latter frequently to make sure people aren't left hanging endlessly waiting for insight. BUT DO NOT WAIT until the day before an test! Avoid the temptation to email me directly about class content or logistics: if you have a question, chances are a large number of other students have the same question and answering it in the ELMS Discussions is more efficient. Reserve emails (but *don't* use the dreadful ELMS mail system, please) for personal communication.

Other Classroom (including during discussion section IRL, or during Zoom presentations) rules: No newspapers, mp3 players, games, etc. And *please* turn off all cell phone ringers or risk ridicule by me. In short, show respect to your TAs, your lecturer, your neighbors and yourself. (Less applicable during remote learning, but be aware.)

Further advice: I'm an easy going guy who tends to be sympathetic, but before you come to [office hours](#), please check you're not about to make one of these [comments for which I will have no sympathy](#) courtesy of Dr. Steve Dutch of the University of Wisconsin).

Some (Necessary) Boilerplate

Almost all of which is also found in [UMD's Course Related Policies](#). You should look at these policies which affect ALL your classes. In particular, pay attention to Academic Integrity, Campus Resources and Accessibility, but all of this affects you sooner or later. Know your rights! er, but also know the University's expectations of you!

BASIC NEEDS SECURITY

If you have difficulty affording groceries or accessing sufficient food to eat every day, or lack a safe and stable place to live and believe this may affect your performance in this course, please visit <http://go.umd.edu/basic-needs> for information about resources the campus offers you and let me know if I can help in any way.

MASKS

It should be obvious by now, but masks are a simple deterrent to spreading COVID (and anything else). Are they perfect? No. Are they better than nothing? *Demonstratively*. We will follow University guidelines as they adapt to changing circumstances (see <https://umd.edu/4Maryland/health-plan>). As I finish editing this syllabus on August 23rd, though, here's my understanding: in classroom settings (lecture, discussion), wear your mask, and wear it properly or I will spare no time in asking you to leave. (If you forget your mask, you are welcome to ask to borrow one, though that seems a bit unsanitary?)

Disability Accommodation

(Worth repeating though you should also see [Accessibility](#) in the Course Related Policies link above). Students with a documented disability who require academic accommodations should contact me as soon as possible. If you suspect you might require such in this class or any, please feel free to discuss this with me during [office hours](#), or head straight to the [Disability Service Support office](#) for more information.

Technology Caveat

If the pandemic forces us back into virtual learning (fingers crossed it doesn't!), we will be relying on a lot of technology to do the heavy lifting of discussion and lecture. At that point, to succeed in this class, you will find a smartphone **insufficient** to the tasks. Quick links to watching Panopto Lectures and movie clips on handheld devices are one thing, but interacting with your group, writing up answers to discussion questions and especially crafting the final group project will be immeasurably easier with routine access to some kind of advanced tablet, laptop, or desktop computer. If that scenario unfolds, please contact me as soon as possible (using email) if your hardware of choice breaks down or doesn't exist. The University may be able to help you in a pinch and in any case, I will be sympathetic when it comes to due dates during such a crisis.

Also, see above for information on supporting your basic needs. We want you to succeed which means we need to have open channels of communication when *any* obstacles to your learning show up from child care to basic necessities.

Academic Integrity

The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the definitions and consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit [the Office of Student Conduct](#) or go straight to [the source](#). Also seen in [UMD's Course Related Policies](#).

Copyright Issues and Your Notes

Selling or distributing copies or modified copies of instructors' course materials or assisting another person or entity in selling or distributing those materials should be considered a violation of the University Code of Student Conduct, Part 9(k). In general, only some of the overhead presentations shown in class will be available on the web. They won't necessarily make a lot of sense by themselves, however, so don't use them in lieu of coming to class! (Besides, then you'd be missing out on easy points - see [§ Lecture Participation](#).) Students may always request a reviewing of them during [office hours](#) on a face to face basis.

Course Evaluations (Word is these are changing soon - stay tuned!)

I am told a new, improved CourseEvalUM will be open for students to complete their evaluations later in the semester. Students can go directly to the [website](#) to complete their evaluations. You will be alerted when the evaluation sites are ready closer to that time via your official University e-mail account.

Students who complete evaluations for all of their courses in the previous semester (excluding summer), can access the posted results via Testudo's CourseEvalUM Reporting link for any course on campus that has at least a 70% response rate. You can find more information, including periodic updates, at the [IRPA course evaluation website](#).

The expectation is that all students will complete these. This is YOUR chance to anonymously evaluate this class: please use this opportunity! I have altered courses before based on constructive criticism from students.

Don't Ask!

I have been praised to the skies by some students and reviled by others. In the end, it makes no difference to me if you love me or hate me. What matters to me is that you broaden your horizons by learning something new in my class. I also hope that you see how passionate I and my colleagues are about physics and astronomy and I hope you develop an inkling of that passion yourself.

Good professors and lecturers put as much effort into designing a course as good students put in to learning the material in it. And we try our best to avoid bias when it comes time to grading. However, there are a few things you can do to also help triggering any frustration on our part

(which, to be utterly honest, can sneak into our perception of your achievements... as unfair as that is). For instance, here are Jorie Scholnik's [Five Things You Should Never Say to Your Professor](#) (USA Today, 10 Jan 2013) along with my snarky answers.

- **Did I miss anything important/Did we do anything important in class?**
Yes. Bummer, hunh?
- **I just took your class for an easy A.**
Feh, good luck with that!
- **I didn't know we had anything due in this course.**
That's why you get a syllabus; and why I make you sign off that you've read it. A syllabus is basically a contract.
- **I was busy studying for my other classes so I didn't do my work for this class.**
Manage your time better next time. It's not my job to address problems of your own making; own it and move on.

Did you answer my email yet?

No. As you would know if you read your email. In other words, don't ask me, just send a nudge email...unless you should have used the [ELMS discussion board](#)! Generic content questions and simple administrivia belongs there; only email me with personal issues (missing class for valid reason, etc.).

In addition, here are some more things which will *not* work with me:

- **Can I email you my assignments?** [default answer "No" - assignments are uploaded in ELMS - see above]
- **Can I turn in my assignments late?** [default answer "No" - genuine emergencies notwithstanding - see above]
- **I have a test in another class today. Can I take your test at an earlier (or later) date?** [default answer: "No" - see above about time management]
- **I just noticed I haven't gotten participation credit for the last five weeks.**
Well, you should have been on top of that and made sure your clicker was working (if this class uses a clicker)...or turned in the exit card (if that's what we're using)... or taken the participation quiz (for remote learning classes)!

To balance that out, here are some things you absolutely *should* ask or tell (far in advance, usually) a lecturer or professor:

- **How's your day (week/month/semester) going?**
Only ask if you want me to ask right back!
- **I didn't understand that; are you saying, "[your interpretation]"?**
An excellent question when you think you heard something confusing! I'll try to phrase it another way - but it's also good to ask on the [Discussion board on ELMS](#), and check in with your groupmates and TAs!
- **I still don't get it: can you phrase it another way?**
I'll try; this is not only acceptable, and advisable, but possibly the hardest for students to ask just when they should. Sure, lecturers may be a little frustrated by your not getting it,

but they're usually more appreciative that you're trying! It's also probably important that you "get it" before we move on or you'll be even more lost later! This is also why talking with fellow students helps a great deal. They'll probably phrase it differently.

- **Can I arrange a makeup test because of [very good reason]?**
Quite possibly if you tell me far enough in advance and for a good reason.
- **How is this material relevant?**
Good one as long as you're not being sarcastic!
- **I can't make regular office hours for this class; can we schedule a separate meeting?**
[usually yes if you really need to, but please don't abuse my time too much; a valid question either way]