

**ASTR 220 Syllabus
Collisions in Space: Spring 2023**

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1. Course Overview

How can we defend our planet against a possible asteroid impact? Our course “ASTR220 - Collisions in Space: The Threat of Asteroid Impacts” will address this question while considering the actual threat from asteroids in space and whether it is worth the cost to mount a defense against them. These concerns have been prominent in the media, as the threat of asteroid impacts is hyped, and much fact and fiction are spread.

We will first learn about the origins of the Solar System, asteroids, and comets, then focus specifically on near-Earth objects (NEOs), which are the ones that may threaten the Earth. We will learn how astronomers observe asteroids and comets to determine their key properties, such as size, mass, density, binarity, porosity, and rotation rate.

The next portion of the course will focus on the effects of impacts and the chances that an impact will occur. The effects of impacts of various sizes will be discussed, using historical impacts on the Earth, such as the Tunguska and Chelyabinsk events and various impact craters as evidence. The methods astronomers use to search for and discover NEOs will be demonstrated, as well as the uncertainties that remain in the characterization of any NEO’s orbit. The orbit, accounting for its uncertainties, is used to determine the probability of an impact. Finally, the methods of communication astronomers use to convey these risks to the public will be discussed.

We will then focus on how an impact by an NEO could be prevented. The effects of the amount of warning time and the size of the impactor on a defense strategy will be taken into account. Ongoing missions to test defense strategies will also be discussed.

In the final portion of the course, we will focus on the policy issues related to NEA searches and impact defense. The current budget for searches and defense will be presented. The risks of impacts and the effects of impacts, including costs, will be compared to the risks and effects of other disasters in order to provide context. We will discuss whether any search and defense effort should be funded and mounted entirely by the U.S., or whether the efforts should be international in scope, and if so how.

1.1 I-Series Course

UMD considers I-Series courses to be “the signature program of General Education (GenEd).” “I-Series courses are lively and contemporary. They speak to important issues that spark the imagination, demand intellect, and inspire innovation. They challenge students to wrestle with big questions and to examine the ways that different disciplines address them. “The I-Series inverts the traditional pedagogical pyramid. Rather than starting with a survey of existing knowledge, the I-Series courses offer Maryland students an opportunity to view large problems from defined disciplinary and interdisciplinary perspectives...or from the perspective of particular fields of study.”

ASTR220 also contributes to the University of Maryland GenEd program, which offers students foundational learning experiences and exposes them to a diversity of disciplines and ways of thinking. General Education courses help students build competence, expand their understanding of the world, and foster their creativity.

1.2 Learning Outcomes

Why are you taking ASTR220? Most likely you want to fulfill your GenEd I-series and/or science requirement. However, if you take full advantage of this course, you can learn not only about the universe around you but also other skills that will help you in any future career you choose. To this end, I hope you will realize several learning outcomes by the time you finish ASTR220 this semester.

The main I-series learning outcome is, “At the completion of this course, students will be able to identify the major question and issues of the I-series course topic.” In ASTR220, the question and issues to explain are:

- Why we as a society should be concerned about asteroid impacts?
- What asteroids are and why they may impact the Earth?
- Why are astronomers limited in their ability to predict if and when an impact will occur?
- What possible steps might be taken to defend the Earth against an impact?

The following goals are capabilities that you have now that your enthusiastic participation in ASTR220 will strengthen. These skills will be useful to you in any career you choose. In particular, since many people now change careers several times, the ability to learn new skills is crucial—ASTR220 can help you learn how to do this by learning how to:

- Think critically and logically about information you encounter
- Understand unfamiliar concepts and different ways of thinking
- Communicate your knowledge to and work effectively with others

1.3 Active Learning

"Tell me and I forget. Teach me and I may remember. Involve me and I will learn."

— may originate from the works of Xun Kuang ("Xunzi"), c. 310—235 BC.

Astronomy is a growing science where new discoveries are being made daily. In order to understand how astronomy works, it's crucial for you to actively engage in the scientific process: examining evidence to explain how things work and why things happen. When you work through scientific concepts and see the application of what you learn in class, you will remember and understand them much better.

The following are key results from cognitive science and education research:

- Learning is productive/constructive — learning requires mental effort
- Knowledge is associative, which means it is linked to prior mental models and formal structures
- Cognitive response is context dependent: what and how you learn depends on the educational setting
- Most people require some social interactions in order to learn effectively

These results are captured in this quotation from *How People Learn* (National Research Council, National Academy Press, 1999): "Students enter your lecture hall with preconceptions about how the world works. If their initial understanding is not engaged, they may fail to grasp the new concepts and information that are taught, or they may learn them for the purposes of a test but revert to their preconceptions outside the classroom." The traditional course model has students listening to a long lecture where facts and concepts are ostensibly learned. Many students try to understand the material by simply memorizing facts from lectures and the textbook without understanding the underlying concepts and principles. This is not learning! In a traditional course, students have little opportunity to actively engage in learning the material in order to truly understand the concepts and their ramifications.

ASTR220 will employ learning techniques that have been shown through research to be most effective:

- *Active learning*: You will engage in the course material by answering questions and working through activities in class.
- *Social learning*: You will discuss topics and concepts with classmates, which will solidify your understanding of the material and resolve questions.
- *Metacognitive learning*: You will analyze how you think and learn to improve your learning and study habits.

1.4 Course Policies

You should familiarize yourself with the University [Course Related Policies](#), which will be followed strictly in this course. These include the absences and academic integrity policies (see later in this syllabus for more information).

A Safe Learning Environment

Our campus is meant to be a safe place to learn, free from harassment and intimidation of any kind. If you have experienced any form of harassment as a member of the University community, you should contact the [Office of Civil Rights & Sexual Misconduct](#) on campus. Please be aware that faculty (and TAs) are required by law to report any instance of sexual misconduct brought to their attention. For confidential assistance, contact [CARE](#). In ASTR220 we welcome all viewpoints and backgrounds. However, everyone should feel empowered to call out problematic behavior, including our own, in the classroom or within teams.

Names/Pronouns and Self Identifications

The University of Maryland recognizes the importance of a diverse student body, and we are committed to fostering inclusive and equitable classroom environments. We invite you, if you wish, to tell us how you want to be referred to both in terms of your name and your pronouns (he/him, she/her, they/them, etc.) The pronouns someone indicates (mine are she/her) are not necessarily indicative of their gender identity. Visit trans.umd.edu to learn more.

In addition, it is your choice whether to disclose how you identify in terms of your gender, race, class, sexuality, religion, and dis/ability, among all aspects of your identity (e.g., should it come up in classroom conversation about our experiences and perspectives) and should be self-identified, not presumed or imposed. We will do our best to address and refer to all students accordingly, and we ask you to do the same for all of your fellow Terps.

1.5 Course Structure

ASTR220 is not a traditional lecture course. The learning procedure for this course will be as follows:

1. *Before lectures*, you will watch a pre-lecture video featuring slides, images, and animations. This is where you will learn the basic facts, vocabulary, equations, and other information you need to begin understanding a particular topic.
2. *Before lectures*, you will take a pre-lecture quiz to test your comprehension of the pre-lecture material.
3. *During lectures*, you will participate in various active, social, and metacognitive learning activities to deepen your understanding of the material, strengthen your grasp of the underlying concepts, and clear up any problems, misunderstandings, and confusion.
4. *During lectures*, you will write a topic brief to help yourself process and understand the material you just learned.

You will be split into teams of 6 students—you will work with your team in lectures and discussion sections in order to help yourself and your team members learn the material more effectively. In lectures, active learning will also include concept tests, which are not graded. You are expected to participate with your team in discussions and lectures or you may lose class participation credit (see the section on grading later in the syllabus). Teams and individuals will be called on randomly.

You will also be required to complete several projects with your team. Each team member must contribute meaningfully to the project. Each team will develop procedures to guide their team's behavior and work process, and to outline procedures for "firing" a team member. *A team member who is fired from a team for a team project will receive a zero for that project.* In addition, I will repeatedly ask each team member to evaluate how well the team is working together and in what way each team member is contributing. **For each of the team projects, I may adjust an individual student's score if I feel these evaluations justify the adjustment.**

Nearpod

During lecture periods, each student will be expected to participate using an app called "Nearpod", which can be accessed from a smartsmartphone, tablet, or laptop (<https://nearpod.com/>). Access is free and does not require registration.

Through Nearpod, the class will share in information and activities based on the day's pre-lecture quiz material. The multiple-choice questions and other activities **will not be graded**; however, you are expected to **sign in with your last name as it appears on the class roster** so that we can credit your participation (see section "Class Participation" below). After class, the Nearpod slides for the day will be exported to a PDF and posted on ELMS (see "Class Website" below).

Distraction by Devices

Obviously, you need to use your electronic device to access Nearpod for class. Other in-class use of electronic devices for activities unrelated to the course is **strongly discouraged**. Excessive use that indicates you are not participating or that distracts other students will prompt us to ask you to leave class and give you zero class participation credit for the day.

1.6 Mutual Expectations

I believe that it is essential that we, as members of a learning community, agree upon what is expected of each other. As a course instructor, my role is to design and manage a learning environment that is rigorous and engaging and that employs evidence-based teaching practices. As a student, your role is to take *personal responsibility* for your learning and actively engage in all aspects of the course. This leads to the mutual expectations that we have of each other.

You, as a student, have the right to expect that:

- All work is evaluated by reasonable, objective, and transparent criteria intended to assess learning.
- All students are treated with equality, professionalism, and respect.
- I will be prepared and on time for every class meeting and scheduled appointment.
- I will maintain a classroom conducive to active learning, discussion, and critical thinking.
- I will be available to assist with coursework and offer referrals to other resources upon request.
- I will read and respond to your emails within 24 hours on weekdays.
- I will do my best to answer any questions that you have, and if I don't know the answer, I'll do my best to work with you so that we can find it (in other words, I won't just make stuff up).

I, as an instructor, have the right to expect you will:

- Devote the necessary time and energy to master the course material. Note: according to the University of Maryland guidelines, you should budget an average of 3 out-of-class hours per week for each hour in class. If your schedule does not currently permit you to satisfy these requirements, I advise you to take the course at another time.
- Be prepared and on time for every class meeting, having completed the assigned work before class.
- Save newspapers, puzzles, email, texting, social media, etc. for outside of class.
- Sleep in your bed, not in class.
- Take responsibility for getting anything you might have missed from a fellow classmate.
- Check your email and ELMS messages at least once every 24 hours.
- Adhere to all course and university policies, deadlines, requirements, and grading criteria.
- Conduct yourself in a professional manner, including in your written communication.
- Seek assistance when you need it and see that your questions are answered to your satisfaction.

1.7 Math in This Course

ASTR220 is a GenEd physical science course, which requires it to have “quantitative reasoning”: math. The math used in the course is at the level you were capable of when you entered the university; however, I realize that your last math course may have been some time ago.

The math we will be using is as follows:

- Scientific notation. You can brush up on this on our [Scientific Notation website](#) or with [Kahn Academy](#).
- Units. You can review SI (metric) units [here](#).
- We will be using mathematical equations to calculate physical quantities. Occasionally, we will be re-arranging these equations using algebra. For a review of this idea, visit [this site](#).
- We will be interpreting graphs.

On the course website on ELMS, under “Pages → Math for ASTR220,” are resources that include examples of the different kinds of math problems you will be doing in ASTR220. If you have any math concerns or difficulties, please visit your TA or me for help!

2. Practical Information

ASTR220 - Collisions in Space: The Threat of Asteroid Impacts is a 3-credit Physical Science course within the Distributive Studies - Natural Sciences part of GenEd; it is also an I-Series course. It does not have a laboratory section, but it does have a discussion section. There are no prerequisites for this course; this course is aimed at non-science majors. **ASTR220 meets Tuesdays and Thursdays from 2:00 to 3:15 pm in ESJ 2212 with Discussions Sections on Wednesdays** (see below). The schedule of class topics and due dates for all assignments are on ELMS under [Syllabus](#) (see “Class Website” below).

2.1 Contact Information

You can make an appointment to meet with us by email or by messaging through ELMS.

Prof. Sunshine	jsunshin@umd.edu	301.405.1045
Giannina Guzman Caloca	gguzmanc@umd.edu	

2.2 Class Website

The course website is on ELMS, which uses the Canvas system; students can log in to their course(s) by going to the [ELMS site](#). A University ID and password, and multifactor authentication are required to access ELMS courses. Information is available on [changing or resetting your password](#). If you are new to ELMS, see the [ELMS orientation](#).

When you log in to ELMS, under the “Courses” menu you will see a link for the ASTR220 website (or use this [direct link](#)). The ELMS site has all course-related handouts and information, including this syllabus. All course announcements will be posted on ELMS as will your grades.

What If I Need to Contact You?

If we need to contact you, we will do so by messaging you through ELMS or by emailing your UMD account. *Make sure to check your ELMS messages and UMD email frequently.* You can set up ELMS to forward your messages to email. We are **not responsible if you miss crucial information that was emailed or messaged to you concerning this course.**

2.3 Discussion Sections

If you are taking ASTR220, you **MUST** attend discussions. Make sure that you are registered for one of the following sections. **Discussions begin on Wednesday, February 1, 2023.** *Note, because you will be working in groups, you must attend the discussion as registered; you cannot switch discussion sections.

Section	Day	Time	Location	TA
0101	Wednesday	9-9:50 am	ATL 2428	Giannina Guzman Caloca
0102	Wednesday	10-10:50 am	ATL 2428	Giannina Guzman Caloca

The discussions are intended to help you learn the material needed for the pre-lecture quizzes, team projects, and exams. You will be actively learning the material through discussions with your team and the other students in the course.

Your grade for each discussion will be based on both attendance and participation. If you are late, the TAs may deduct from your discussion score for that day. More details will be given in the first discussion. The TAs will use their discretion for judging attendance and participation. *Their decision is final and will be supported by me.*

There are 14 discussions. Your 2 lowest discussion scores will be dropped. The remaining scores make up 10% of your course grade. If you add the course after the first or second discussion, then those scores are the ones that will be dropped from your grade. **It is your responsibility to remember to sign in at each discussion. If you forget, you MAY NOT sign in retroactively or make up a missed discussion section.**

2.4 Textbook

There is no textbook for ASTR220.

3. Grading

All material in ASTR220 will be graded based on those responses that answer the question asked; partial credit may be given. Credit will not be given simply for effort. The table below shows the breakdown of the course grade.

Work	Percentage of Course Grade
pre-lecture quizzes (19 of 22)	10%
topic briefs (18 of 21)	10%
discussions (11 of 13)	10%
mission briefs	10%
spacecraft proposal	10%
international decisions	10%
class participation (26 of 29)	5%
participation in team evaluations	5%
midterm exams (2)	15%
final exam	15%

Note: once your grade is calculated following the table above, any Contract Deduction you received will be subtracted from your grade. (See subsection "ASTR220 Contract" below.) I expect that an average student in this course will earn at least a B-. If the exams or assignments prove more difficult than expected, the minimum course grade percentages for each letter grade may be lowered; they will never be raised.

No extra credit will be given in this course. If you do not feel you are doing as well as you could be on the assignments, arrange to meet with your TA or me to discuss them before they are due. Don't wait until the end of the semester!

Letter Grade	Minimum Course Grade Percentage	Letter Grade	Minimum Course Grade Percentage
A+	97.5%	C+	77.5%
A	92.5%	C	72.5%
A-	90%	C-	70%
B+	87.5%	D+	67.5%
B	82.5%	D	60%
B-	80%	D-	52.5%

3.1 ASTR220 Contract

The ASTR220 syllabus is a contract between the student and instructor that lists the guidelines, rules, and conditions for the course. The Contract requires you to answer some simple questions about the administration and grading of the course, which you can answer by reading the syllabus.

To AVOID a deduction in your course grade, you must complete the ASTR220 Contract Questions correctly by the beginning of lecture (2 pm) on Thursday, Feb. 9th, 2023. After a one-day grace period, you will receive a deduction of 2.5% to your course grade per calendar day that you do not complete the contract questions correctly.

On the next page is an example tabulation of the amount that will be **DEDUCTED** from your course grade if you do not correctly answer the ASTR220 Contract Questions **BEFORE** the following dates and times. If not completed correctly, this could have a MAJOR effect on your course grade.

Before Date (2 pm)	Days After Due Date	Deduction	Effect on Your Grade
Thursday, Feb. 9	0	0%	No effect
Friday, Feb. 10	1	0%	No effect
Thursday, Feb. 16	7	15%	Better than B impossible
Wednesday, Feb. 22	13	30%	Better than C- impossible
Tuesday, Feb. 28	19	45%	Better than D- impossible
Thursday, Mar. 2	21	50%	IMPOSSIBLE TO PASS COURSE

The ASTR220 Contract questions are administered as a quiz on the course website on [ELMS](#). Go to the website and log in. Under "Courses," click on the link for this course (ASTR220). Then, on the menu on the left side, choose "Assignments." You will see an item called "Contract Questions." Click on that to begin the quiz.

If you answer some questions incorrectly, you may redo the quiz as many times as necessary to get them all right. The deduction you will receive to your course grade (as described above) will be computed based on when you correctly completed the questions. This deduction will be entered in a column in the gradebook called "Contract Deduction."

3.2 Pre-lecture Quizzes

There will be 22 pre-lecture quizzes for the course. (The following lectures will **NOT** have pre-lecture videos nor pre-lecture quizzes: 1, 12, 19, 24, 26, 27, 28.) Pre-lecture quizzes will be based on the pre-lecture video material. Your 19 highest pre-lecture quiz scores will count toward your course grade.

The pre-lecture quizzes will be completed on [ELMS](#). Go to the website and log in. Under "Courses," click on the ASTR220 link. Then, on the menu on the left side, choose "Modules." You will see modules for each of the course lectures; within each lecture's module are the pre-lecture video and pre-lecture quiz.

The pre-lecture quizzes are not timed, but the quiz must be submitted before the due date: 2 pm on the day of the lecture. **You can only submit the quiz once.** You can start a quiz and save your answers for later without submitting it, but if you forget to submit your saved answers, they will not count.

What if you miss a quiz? Your 3 lowest or missing quizzes will be dropped. So if you miss a quiz, it will count as one of your dropped scores.

- If you save your answers and forget to submit them, you may not submit them later after the due date and time.
- *You are responsible for planning ahead to ensure that you have a reliable internet connection to submit the quiz.* An internet failure at the last moment is **NOT** an excuse and you will receive a zero for that quiz.

- If you are too sick to use the computer and complete the quiz, then you will receive a zero, and it will count as one of your dropped quizzes. (If you have an illness that causes you to miss more than one consecutive quiz, please see the “Absences” section for what to do.)

3.3 Topic Briefs

There will be 21 topic briefs for the course; all lectures that have pre-lecture quizzes also have topic briefs, except lecture 29. The topic briefs will require you to utilize exploratory writing to answer a rather open-ended question about the material presented that day. The topic briefs will be written on-online ELMS at the end of class.

The purpose of the topic briefs is to improve your writing skills and to stimulate thinking about the issues, questions, and problems raised by the class material. You will achieve the best score on the topic briefs by showing that you are thinking carefully about the relevant concepts and expressing your thinking clearly in writing.

To put your topic briefs into a meaningful context, you will imagine that you are a staff member working for a U.S. Senator. Your area of expertise is astronomy and asteroids. Through the topic briefs, you will be explaining and clarifying relevant concepts to the Senator.

The topic briefs will be graded out of 5 points each, following the rubric below. *I expect the average student to receive a 4.5, with a score of 5 indicating an above-average topic brief.*

- 5:** The writer understands the concept well. Course material relevant to the question is discussed in easily understood prose. There are no major errors in the use of astronomical terms. The response is easily readable with no major grammatical or other errors, although there may be a few small errors, and is long enough to completely answer the question in a satisfactory way (usually a paragraph).
- 4.5:** The writer understands the concept reasonably well, but compared to a 5 response, there are some inaccuracies or vagueness in the discussion. Or the material in the response may be quite good but be too short to answer the question satisfactorily. Or, there may be a few major grammatical/writing errors or many smaller errors (such as punctuation and misspelling).
- 4:** The writer has some misunderstandings about the concepts discussed in the response; however, the writer has demonstrated considerable thought and effort in trying to understand the material. Or the response could have been a 4.5, except for a large number of typos, many social messaging abbreviations, or sections of the response that were incomprehensible.
- 3:** The writer has not addressed the question directly but has written a “data dump” of material from the class. The response consists of true, but unconnected facts, definitions, and statements.
- 1:** A response for which the presented facts have numerous inaccuracies. Or a response that is incomprehensible.

Your best 18 out of 21 topic briefs will count toward your final score. This means you can miss 3 topic briefs entirely and score 4 on half the remaining topic briefs and 5 on the other half, and still get a grade of “A–” in this category. (If you have an illness that causes you to miss more than one consecutive lecture and topic brief, please see the “Absences” section for what to do.)

3.4 Mission Briefs

The primary method that astronomers use to learn in detail about objects that could potentially impact the Earth—i.e., asteroids and comets—is to send spacecraft to visit these objects. Because spacecraft missions are so crucial to how we learn about these objects, your team will be learning in detail about a spacecraft mission that has visited an asteroid or comet in the past, is currently visiting such an object, or will be doing so in the future. Your team will be learning about the spacecraft’s mission and major discoveries/objectives, its flight path and method of propulsion, and its choice of instruments for studying the target object. Assignment of spacecraft missions to each team will be discussed in class.

A detailed hand-out will include complete instructions for what will be done in this project, which intermediate steps are due along with their due dates, and a grading rubric. After the final write-up for this project is due, an in-class presentation period on the material will be held; each team will write a brief summary of the presentations.

The overall grade for the Mission Briefs will have the following components:

- Prospectus: 5%
- Rough draft: 5%
- Final draft: 75%
- Summary of in-class presentations: 15%

After this grade is determined, I may adjust it for each student according to my interpretation of the team evaluations (see above in “Active Learning”).

3.5 Spacecraft Proposal

You will also be “proposing” a spacecraft mission with your team: the mission’s goal is either to study a near-Earth asteroid or to deflect a near-Earth asteroid on an impact course. I will assign each team a mission goal. Your team will have a budget and will have to design your spacecraft using components from a list I will provide. Your team will have to decide which components are best suited to achieve the goal of your mission. Your team will submit a spacecraft mission proposal describing your goal, the design of your spacecraft, and how your design will meet the mission goal.

To make sure that you are thinking about this project with sufficient time to write an adequate proposal, a rough draft of the Spacecraft Proposal will be due and returned with feedback that you can use for your full proposal. The Spacecraft Proposal does not have a required minimum length: it may be as short as is sufficient to describe your proposed spacecraft and your design choices fully. The details of the proposal will be discussed in class.

Your Spacecraft Proposal will be evaluated by myself and the TAs, but it will also be evaluated (anonymously) by other teams in the class in a peer-review session in lecture. Each proposal will be evaluated by at least two other teams to help compensate for any team that grades too harshly or too easily.

The grade you receive on your Spacecraft Proposal will be based on the following components:

- 70% will be based on my evaluation of the proposal.
- 20% will be based on the evaluation of the proposal by your peers.
- 5% will be based on your participation in the peer review of your classmates’ proposals.
- 5% will be based on your rough draft.

After this score is determined, I may adjust it for each student according to my interpretation of the team evaluations (see above in “Active Learning”).

3.6 International Decisions

As we learn in the course about the possibilities of impacts by near-Earth asteroids and how we could defend the Earth, we will also learn that many situations could arise where tough decisions will have to be made and there is no “correct” decision. In class, we will be learning about an international committee, the Space Mission Planning Advisory Group (SMPAG), which was formed by the United Nations with the purpose of making decisions regarding future near-Earth object impact threats.

Each student team will be assigned a country to represent on SMPAG. Each team will do some research to find out specific facts and attitudes of “their” country toward spaceflight and the asteroid impact threat; this research will go into a Country Position Statement and form the basis of future reasoning by the team representing this country. Over two lecture periods we will “send” country representatives to sit on multiple SMPAG committees and be presented with impact scenarios; the SMPAG committees will have to choose the best course of action to mitigate (or not) the impact threat. The committees will have to negotiate their decisions by considering the input of all of the member countries and then write decision paper regarding the reasoning for their decision. Each individual country will also write a paragraph explaining the position of that specific country. More details on this project will be discussed in class and in a detailed handout. The grade you receive for International Decisions will be determined as follows:

- 40% will be based on the Country Position Statement.
- 20% will be based on participation in the SMPAG discussions.
- 40% will be based on the final report.

After this score is determined, I may adjust it for each student according to my interpretation of the team evaluations (see above in “Active Learning”).

3.7 Team Evaluations

One of the teamwork skills you will be developing in this class is the ability to give constructive feedback about how your teammates are working with your team and to receive constructive feedback about your own performance with your team. You will be required to provide feedback about yourself and your team members at several points throughout the semester. Your *sincere* participation in these team evaluations will receive full credit; the content of your evaluation and feedback will NOT be graded for “correctness.”

Four team evaluations are planned. Your sincere participation in them will receive 100% for this component of the course grade. You will receive instructions in class on how to complete the team evaluations. These evaluations will inform any decisions I might make to adjust project grades for each student. See the “Absences” section below if you miss a team evaluation opportunity.

3.8 Class Participation

Class participation is crucial for your understanding of the material in the classes and for your success in the course. I will assume that if you are attending class that you are participating in class; as such, I will be recording your attendance at each lecture. If you have joined the class after the first day of class, make sure to notify me to be filled in on what you missed and what you need to make up.

At the beginning of each class, you should log in to Nearpod to access the class activities; use your last name as given on the class roster. My records for each Nearpod class session will be used to determine your attendance and participation; you should be present and logged in to Nearpod for the majority of the class time. At my discretion, if I feel that you are “gaming” the system, I may deduct from your class participation points.

It is **UNACCEPTABLE** for you to log in to Nearpod for a friend in order to give them class participation if they are not present, and **to do so is a violation of the University Code of Academic Integrity** (see below).

Your presence or absence in each lecture will be listed in the gradebook on ELMS, under the lecture number for each day. A score of 1 means you were present and participated, while a score of 0 or - means you were not. You may miss up to 3 lectures without penalty (see “Absences” for more information).

3.9 Exams

Exam	Date	Time
Midterm 1	Tuesday, March 7th	in class
Midterm 2	Tuesday, April 25th	in class
Final Exam	Wednesday, May 17	10:30 am - 12:30 am

You may use a scientific calculator on the exams. You **may not** use any other type of device, such as a smartphone, computer, or tablet. A list of equations used in the class, as well as unit conversions, will be provided on the exam.

Do not be late for the exams—you will not receive extra time. Traffic problems are not an excuse. You must have your student ID with you to the exams.

All examinations will be held in ESJ 2212, our regular classroom. The final examination will be cumulative. The midterm exams, final exam, Spacecraft Proposal Peer Review, and class time activities related to the Mission Briefs and International Decisions are **major scheduled grading events**.

If you are ill on the day of a major scheduled grading event and cannot attend, you or someone else must contact me before the event is finished. If you are entitled to a makeup exam, it may be in another format of my choice. See the “Absences” section below for more information.

If the University is closed officially on the day of a major scheduled grading event, the event will be held during the next regularly scheduled lecture (or in the case of the final exam, at a time, day, and place to be announced).

If you find a mistake in the grading of a midterm exam or wish to have the grading of the exam re-checked (I will then re-grade the ENTIRE exam not individual questions), you must do so within two weeks. After that time, no further changes will be made to the prior exam’s grade. I will retain the final examination for each student for one year after the final examination has been given.

Team Exams

The midterm exams and the final exam will each have an individual and a group component. Approximately 2/3 of the exam time will be allotted for each student to complete the exam individually, and approximately 1/3 of the time will be allotted for student teams to complete the same exam. Exact details will be announced in class prior to the exams.

Each student’s total for an exam, which is the score that counts toward their course grade, will be a combination of their score on the individual exam as well as the team exam. The total score will be weighted so that 75% is based on the individual exam and 25% is based on the team exam. However, if the score on the team exam is lower than that student’s score on the individual exam, then the group exam will not be included in the individual’s total score.

4. Absences

According to the University [Course Related Policies](#) (hereafter, the Policy), the instructor is obligated to allow makeup work or provide alternate arrangements **only for excused absences**.

The Policy states an excused absence may result from “religious observances, mandatory military obligation, illness of the student or illness of an immediate family member, participation in university activities at the request of university authorities, and compelling circumstances beyond the student’s control.”

- Examples of a “compelling circumstance”, which I hope you do not experience: a death in the immediate family, a required court appearance, a serious car accident involving yourself or a family member, a fire at your home.
- Some examples of incidents that are **NOT** emergencies: running out of gas for your car, a flat bike tire, the bus being late, bad traffic on the highway, internet outages, your computer breaking. These are circumstances for which you need to plan ahead and allow yourself extra time daily to arrive on campus and just in case you have computer problems etc. If you experience one of these delays and it causes you to miss a lecture, remember that you may miss up to regular 3 classes with no penalty to your grade.

4.1 What to Do If You Have an Excused Absence

Planned Excused Absences

- If you must be absent FROM LECTURE for a university-approved athletic event (or other university activity) or religious observance:
 - *you must contact me at least 1 week in advance* to make appropriate arrangements to complete the topic brief within one week of your absence. You must be prepared to hand in projects *before* your absence. You are still responsible for completing any online work on time or prior to when you leave.
- If you must be absent FROM DISCUSSION for a university-approved athletic event (or other university activity) or religious observance:
 - you must contact your TA *at least 1 week in advance*. Your TA will make arrangements with you to complete any work to make up for your absence. *You must make up missed discussion work within one week of your return* (unless your TA makes a different arrangement). If you register for the class after the first discussion is held, the missed discussion counts as one of your dropped scores.

Unplanned Excused Absences. **NOTE:** You may only submit one [self-signed excuse due to illness](#) per semester—for additional or extended medical absences, you must provide documentation from a doctor or the University Health Center.

- **If you miss an EXAM because of illness or a compelling circumstance...**you or someone else must contact me by phone or [email](#) **BEFORE THE EXAM IS FINISHED**—if you are too ill to get out of bed, get a friend or relative to contact me. These are major scheduled grading events, so you are required to have a University Health Center excuse or another official medical excuse to present to me upon your return. If you have a “compelling circumstance”, you must be prepared to document it. Once you have contacted me, you must take a makeup exam as soon as possible, but no later than one week after you return to your normal schedule. The makeup exam may be in an alternate format of my choice (likely oral).
- **If you miss a LECTURE (no exam) because of illness or compelling circumstances...** you must contact me by phone or [email](#) within 48 hours—if you are too ill to get out of bed, get a friend or relative to contact me. You must be prepared to document how your absence fell under the University’s excused absence policy. Since it is not required to do all topic briefs, there will be no makeup for the one you miss. The same is true for class participation.
- **If you miss a DISCUSSION because of illness or compelling circumstances...** you must contact your TA within 48 hours. You must be prepared to document how your absence fell under the University’s excused absence policy. Your TA will make arrangements for you to complete makeup work. *You must make up missed discussion work within one week of your return to classes* unless your TA makes a different arrangement.
- If you are unable to be online to complete a PRE-LECTURE QUIZ...the quiz you miss will count as one of your dropped scores. Your internet connection being “down” is not a “compelling circumstance!”
- If you are unable to be online to complete a TEAM EVALUATION...you or someone else must contact me by phone or [email](#) **BEFORE THE TEAM EVALUATION PERIOD IS FINISHED**—if you are too ill to get out of bed, get a friend or relative to contact me. If you have a “compelling circumstance,” you must be prepared to document it.
- **If you have an extended illness causing you to miss more than one lecture and/or discussion in a row...** you

must notify me as soon as you are able. For such an extended illness, the Policy states that you must provide an excuse from the University Health Center or other medical provider. You must present this excuse to me in person within one week of returning to your normal schedule so that we can make special arrangements for making up the work missed.

4.2 What to Do If You Have an Unexcused Absence

- **Unplanned Unexcused Absences.** Examples of reasons for unexcused absences: traffic problems, oversleeping, forgetting the assignment was due, missing the bus.
 - If you miss a regular **LECTURE (no exam)** for an “unexcused” reason, you will not be counted as present, nor may you make up the topic brief.
 - If you miss a **DISCUSSION** for an “unexcused” reason, you may not make it up. You may miss two discussions with no penalty.
- If you miss a **PRE-LECTURE QUIZ**, **TOPIC BRIEF**, or **TEAM EVALUATION** online for an “unexcused” reason, you may not make it up.
- If you miss a **MIDTERM EXAM** for an “unexcused” reason, you may not make it up.
- **Planned Unexcused Absences.** I realize that important events may occur at inconvenient times. Examples of important events that are not “compelling circumstances”: participating in a wedding, attending a major political event, or attending a job interview.
 - If you have an important event that will occur during **discussion**, contact your TA at least **one week** ahead of time. At your TA’s discretion, you may make arrangements following the “planned excused absence” policy described above to make up any work you will miss. **No student may do this more than once.**
 - If you have an important event that will occur during a **PRE-LECTURE QUIZ or TEAM EVALUATION** due date, then you must submit it early.
 - If you have an important event that will occur **on the date of a midterm exam**, contact me **at least 2 weeks in advance** and explain to me the nature of the event. **At my discretion**, I may allow you to take an examination **EARLY**. I may require documentation of your participation in the event (for example, a program with you listed as a participant). **No student may take an exam early more than once, and I am under no obligation to allow ANY student to take an exam early.**
 - You will not be counted as present for any lecture(s) you miss. You may not make up the topic brief.

If you have a number of such important events during the semester and will consequently miss a lot of class time, you will not do well in this class, and you should reconsider taking it.

5. Student Accommodations

If you have a documented disability, you must provide me with a copy of the University documentation by Thursday, Feb. 9, 2023, or as soon as possible after a new or changed accommodation is identified. When you bring me the documentation, we can discuss how the accommodation you are permitted is best met in this course.

5.1 Additional Help

Taking personal responsibility for your own learning means acknowledging when your performance does not match your goals and doing something about it. I hope you will come talk to me or your TA so that we can help you find the right approach to success in this course, and I encourage you to visit tutoring.umd.edu to learn more about the wide range of campus resources available to you. If you would like to improve your writing and communication skills, consider scheduling an appointment with the campus [Writing Center](#). For help in writing professional emails, visit ter.ps/email. You should also know there are a wide range of resources to support you with whatever you might need (see go.umd.edu/assistance), and if you just need someone to talk to, visit counseling.umd.edu or one of the many other resources on campus. Most services are free to use because you have already paid for them, and **everyone needs help**...all you have to do is ask.

6. Academic Integrity

The process of scientific inquiry and education depends on the integrity of all participants. The University has a

nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at UMD for all 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 consequences of cheating, fabrication, facilitation, and plagiarism. For more information, see the University [Course Related Policies](#). If you are uncertain whether an activity violates the Code of Academic Integrity, see the “Academic Dishonesty Information & FAQ” document posted under “Pages” on our ELMS course page, or contact me.

6.1 Working Together

I encourage students in the class to discuss the material, including the pre-lecture quizzes and topic briefs. Please:

- Talk about the question and where you might find the answer.
- Talk about the concepts and details in the question.
- Work on example math problems on scratch paper or whiteboard.

These things are encouraged. However, be very careful that when you answer the pre-lecture quizzes, you do so **independently**. That means that there are things you **should not do**. These include:

- Do not give another student an answer to a pre-lecture quiz question or topic brief.
- Do not develop exact sentences and paragraphs for your topic briefs with another student.
- Do not work out complete math problems for another student.
- Do not copy work from one student to another, **even if you worked out the answer together**.
- Do not copy text or wording directly from the pre-lecture videos without quoting it and providing the source.

You must write your work up independently so that we know you understand the problem. If you have identical work to that of another classmate, even if you worked on it jointly, you will have violated the University Code of Academic Integrity and the work of all students involved will be referred to the Student Honor Council.

6.2 Group Chats

We are aware that there will likely be a group chat established for this course. We encourage the use of a group chat for discussion of the course material and concepts, as long as that discussion follows the acceptability guidelines listed below. All of the rules in this course syllabus also apply to any postings in a group chat or other social media venue.

As you use a group chat for this course, keep in mind that *it is unacceptable to have another person do your own work*. You must write up your own answers in your own words, unless the assignment is a designated group activity. If others post information on the group chat, you should verify that it is correct and complete so that it helps your understanding rather than hinders it. You should never copy the work of another person or other source without quoting it, citing it, and providing a full reference, because otherwise that is plagiarism (see below).

6.3 Plagiarism

The University of Maryland Code of Academic Integrity defines plagiarism as “representing the words or ideas of another as one’s own in any academic course or exercise.” If you copy material from another source, such as a textbook, a website, or another student, without giving credit to your source, you have plagiarized and have violated the Code.

When you are writing up your projects, be careful to avoid plagiarizing a textbook or a website. When you quote a phrase from a textbook or another source, make sure to indicate it is a quote and give your source.

Plagiarism will not be tolerated in ASTR220! If you plagiarize a significant amount of a project, your work will be sent to the Office of Student Conduct for evaluation and possible penalty—typically an XF grade for the class.

7. Copyright

The course materials I create, including presentations, tests, outlines, and similar materials, are protected by exclusive copyright. You may take notes and make copies of course materials for your own use. With prior permission from me, you may record lectures for personal use. You may NOT, and may NOT allow others, to reproduce or distribute course materials publicly, including on websites, without my express written consent.

8. Schedule

The complete lecture, discussion session, and exam schedule for this course can be found on the [ELMS ASTR220 page under Syllabus](#).