

DRAFT SYLLABUS

PHYS 122: Introductory Physics II — Fall 2020

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Dr. G Office Hours: MW 1-2 PM; TuTh 5-6 PM

Welcome to Introductory Physics II! This course is the second semester of the calculus-based introductory physics courses. Our course will focus primarily on electricity, DC circuits, magnetism, and thermodynamics. The Table of Contents (formatted as a series of questions) below will help direct you to any section in the syllabus that you might be interested in, however it is your responsibility to read over the syllabus to familiarize yourself with course policies. Please let me know if you have any questions or concerns and I look forward to working with you this fall!

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What Are the Course Prerequisites?

- In order to be enrolled in this course, you must have completed MATH 152 or MATH 152H with a "C" or better OR be concurrently enrolled in MATH 152 or MATH 152H.
- In order to be enrolled in this course, you must have completed PHYS 121 or PHYS 121H with a "C".
- You are expected to know basic algebra, geometry, trigonometry, & calculus which will be used extensively throughout the course.

What are the Course Resources and Extra Help?

- **Synchronous Help — Office Hours:** For Dr. G and the TAs they will be held in BB Collaborate rooms. Find the appropriate room on the course BB page. Be sure it has the correct time and date.
- **Dr. G's Office Hours:** MW 1-2 PM; TuTh 5-6 PM
- **TA Office Hours:**
 - Kamal Aryal (karyal1@umbc.edu): TBA
 - Scott Dusek (scott22@umbc.edu): TBA
 - Emily Faber (efaber1@umbc.edu): TBA
- **SI/PASS (Supplemental Instruction — Peer-assisted Study Sessions):**
 - Dylan Ricks (dricks1@umbc.edu): TBA | These will be held on Discord.
- **Asynchronous Help — VoiceThread:** VoiceThread is a collaborative, asynchronous tool that acts like a discussion board that allows you to hear and see others, not just read what they write. Try it out today!
- **Asynchronous Help — Discussion Board:** A discussion board is available on Blackboard for both general questions about the course (such as questions regarding course policies) as well as physics related questions.

What Are the Required Materials and Technologies?

- This course participates in the **Course Materials Initiative (CMI)** which is a program developed to provide students with reduced pricing for course materials through digital textbooks and ancillaries. This means that our textbook (Tipler) and online resources (FlipIt Physics) are included when you register for this course and do not have to be purchased separately.
- Primary Source Material: **FlipIt Physics** will be used for pre-lecture videos and homework assignments. Instructions on how to access FlipItPhysics are available on BB. For questions about initial sign-on and accessibility contact FlipIt Physics: 1-800-936-6899 or [FlipIt Physics Help](#).
- Supplemental Material: **Physics for Scientists and Engineers, by Tipler and Mosca, 6th ed., Volume 2:** An electronic version of this textbook is available online when you enroll in this course — see the Blackboard site for details. The textbook provides an additional perspective on the FlipIt material as well as worked out examples. For questions about how to obtain and access the online textbook contact the bookstore: textbook@umbc.edu or 410-455-2695.
- UMBC requires all students to be technologically self-sufficient, which entails having a **reliable personal computer** (preferably a laptop with webcam) and **Internet access**. Since UMBC requires all students to have a computer and Internet access, financial aid may be used to meet this requirement. To learn more, students should contact their financial aid counselor at financialaid.umbc.edu/contact. In addition, the Division of Information Technology (DoIT) provides a wealth of resources and support, including tips for getting online and minimum specifications to consider when purchasing a computer (doit.umbc.edu/students)
- You may use a **scientific calculator** on homework, discussions, and quizzes/exams.

How Will I be Graded?

Type of Assignment	Percentage
FlipIt Physics: Pre-lecture & Checkpoint	5%
Class Questions	10%
Discussion	10%
FlipIt Homework	15%
Weekly Quizzes	50%
Final Exam	10%
Total	100%

Percent Range	Letter Grade
90.0% or Above	A
80.0% - 89.5%	B
70.0% - 79.5%	C
60.0% - 69.5%	D
59.5% or Below	F

- There will be **no** extra credit at the end of the semester. If you are struggling in class, it is far easier to fix problems early in the semester than waiting until the end of the semester.
- You should check your grades regularly on BB, and contact me or your TA with any grading questions ASAP.

What are the Course Learning Objectives?

An integral component of this course are learning objectives (LOs) — a list of tasks that you should be able to perform by the end of the semester. The entire course (class time, discussion, homework, quizzes) is geared toward helping you develop the conceptual understanding and problem solving skills necessary to successfully complete these LOs.

The big, overarching LOs that you should be able to demonstrate by the end of the semester are:

Thermodynamics (TH): The first law of thermodynamics constrains thermal processes based on conservation of energy; the second law of thermodynamics gives the direction of thermal processes.

- TH1: Apply the first law of thermodynamics, ideal gas law, and ideas of molar heat capacity to thermal processes with ideal gases.
- TH2: Analyze the performance of thermodynamic cycles.

Electricity (EL): Charged particles create electric fields; electric fields exert forces on charged particles.

- EL1: Use Coulomb's law and the principle of superposition to find electric fields of charged particles and determine forces on charged particles.
- EL2: Apply Gauss's law to find electric fields of symmetric charge distributions and infer charge distributions on conductors.
- EL3: Qualitatively and quantitatively reason with electric potential and electric potential energy; determine electric potential difference from electric field.

DC circuits (DC): Potential difference across a conductor results in electric current.

- DC1: Apply the definition of capacitance and Kirchhoff's rules to find charges and voltages in circuits containing batteries and capacitors.
- DC2: Apply Ohm's law and Kirchhoff's rules to find currents, voltages, and power in circuits containing batteries and resistors.
- DC3: Analyze charging and discharging processes in circuits containing batteries, resistors, and capacitors, i.e., determine charges, currents, and voltages as a function of time and in limiting cases of small and large times.

Magnetism (MG): Electric currents create magnetic fields; magnetic fields exert forces on moving electric charges.

- MG1: Determine the magnetic force on a moving charge particle and its resulting motion, the magnetic force on a current-carrying wire, and apply ideas of torque and potential energy to current loops in magnetic fields.
- MG2: Apply results of the Biot-Savart law and the superposition principle to determine magnetic fields due to infinite straight wires and current loops.
- MG3: Apply Faraday's law to determine the EMF arising from a changing magnetic flux.

Even more importantly are a detailed list of learning objectives that you should be able to perform for each FlipIt unit. You will find these on BB in each of the weekly folders and should use them as a guide on what to study for on the quizzes.

What Are the FlipIt Physics Pre-Lectures & Checkpoints?

- You will be introduced to the material every week through 1-2 FlipIt Units. Each FlipIt unit has associated videos and checkpoint questions that you must watch and answer before watching the class videos. The videos and checkpoint questions will be made available 5 days before they are due. Checkpoint questions are graded only participation. Failure to watch the videos for their total length could result in losing credit for that unit.
- It is important to put forth a solid effort on being introduced to and grappling with the material before watching the class videos; going to discussion; or working on the homework. Do not expect to get much out of the class videos; discussion; or homework if you don't put in the time on the videos/checkpoint questions.
- The FlipIt Physics pre-lectures and checkpoints will be due on Sundays at 11:59 PM. See the calendar on FlipIt for the exact schedule.

What Will Class Look Like?

- Class will be held asynchronously — meaning you do not have to show up for class at a certain time. Instead, I will be recording weekly videos for each Monday and Wednesday class and posting them on Blackboard in the weekly folders.
- I will mainly be working through examples and problems from that week's FlipIt units, and not spending time on introducing concepts and equations. Don't expect to get much out of these videos if you haven't put in a solid effort on watching the pre-lectures and grappling with the material **before** watching the class videos.
- The best way to use the class videos is to pause them frequently and try to solve a particular problem **before** I go through it. It is important to understand how you solve and approach problems and in particular where you might get stuck. This only happens if you put in the time and effort into trying to solve problems before you watch me or someone else solve them.
- Each video will have an associated set of questions (Class Questions) which will be due at the end of the day for that associated video (usually Monday and Wednesday at 11:59 PM; see FlipIt schedule for exact dates). The Class Questions will be located in the weekly folders and will be available the entire day for which they are due. You will have three attempts for each Class Question.

What Kind of Homework Will I Have?

- The main way you learn physics is by doing physics, AKA working through homework problems. There will be a homework assignment associated with each of the FlipIt units. They are typically due on Thursdays at 11:59 PM (see the complete schedule on the FlipIt Physics website for when each is due). They are made available 6 days before they are due.
- You are allowed ten submissions per question and your answer must be to within 1% of the correct answer. Keep plenty of extra significant figures (at least four) for your answers as answers to early parts of a problem

are usually used later in the problem and rounding errors can cause you to miss a question even though your physics approach is correct. Most questions you will receive immediate feedback on, however some questions with a clock symbol next to them have delayed feedback meaning you will not know whether you got it right or wrong until after the due date. Longer homework problems usually have a greater weight toward your overall homework grade than shorter problems.

- **Before** starting the homework, you should make sure you are able to solve and correctly think through the examples covered in the class videos. When you get stuck on a homework problem refer back to the FlipIt and class videos to find similar examples and take advantage of office hours.
- You are encouraged to work together, however, it is your responsibility to fully understand the material. Even though homework constitutes 15% of your overall grade, quizzes/final exam – for which you are solely responsible - make up the majority at 60%. Don't expect to do well on these unless you have put in serious effort on the homework.

What is Discussion?

- Where and when? Synchronously held on Monday, Tuesday, or Wednesday on BB collaborate. See page 7 for discussion schedule. You **must** go to the discussion session for which you registered, and are **not** allowed to attend another session.
- What will I be doing? You will work in small groups on problems related to recent FlipIt units (see schedule on FlipIt). The discussion packet will be made available shortly before each discussion. You can either print off the discussion packet or write your work on blank paper. TAs and LAs are present during discussions to answer questions and provide guidance — they won't tell you the right answer but will point you in the right direction. Students are encouraged to work together and ask TAs questions, but each student must submit their own work via a link on BB.
- How is it graded? Based on both completion and accuracy with exact proportions determined after each discussion. You must submit your written work on BB — emailed work will not be accepted. Discussion is meant to be a low-stakes environment where you can build up your conceptual and problem solving skills. Penalties may be earned for lack of attendance, not actively participating, etc at the instructor's discretion.
- What in the attendance policy? Attendance is mandatory and will be automatically recorded in BB Collaborate. An overall reduction of your discussion grade will be imposed for being late as followed: 5-10 minutes late 5%; 10-15 minutes 15%; 15-30 minutes 30%; more than 30 minutes zero for discussion.

Are There Exams or Quizzes?

- There are no high-stakes exams throughout the semester, instead you will have a quiz roughly at the end of every week — 12 quizzes total; worth 50% of your overall grade. In addition, there will be a final exam (worth 10% of your overall grade).
- Where and when? Two back-to-back 20-minute quizzes will be given roughly every Friday during the regularly scheduled class time 1:00-1:50 PM. They will be made available in that week's class folder. The first 20-minute quiz will be accessible from 1:00-1:10 PM and the second will be accessible from 1:30-1:40 PM. Once started you will have 20 minutes to complete each quiz.
- What? Questions will be multiple choice, multiple answer, or numerical answer with questions and answers randomly sorted and selected for each student.
- How should I study for the quizzes? You should work through problems from pre-lecture videos/checkpoint questions; class slides; discussion material; and homework problems that pertain to each of the learning objectives associated with a unit. See the schedule on FlipIt to see what material will be on each quiz. Quizzes may be comprehensive with some questions coming from previous units.
- What can I have and not have for the quizzes? You can have any notes; scratch paper; and a calculator at hand. You are not allowed to have any other electronics or seek out or give assistance to others.

- How will the integrity of quizzes be ensured? Cheating on assessments has always been an important issue and in particular now with a fully online course. Hopefully, you are as concerned with this issue as I am if you want to earn a meaningful grade and for your UMBC degree to actually mean something. I will be ensuring the integrity of quizzes by having short (20-minute) quizzes with randomized questions and answers. I will be actively monitoring the internet to see if quiz questions/solutions are being posted. You are **prohibited** from communicating with others during the quizzes; accessing any websites other than BB; posting questions or solutions to quizzes on any website; and seeking or giving assistance in any shape, form, or fashion. If I found out you have performed any of these actions, I will report you to the Academic Conduct Committee and impose a penalty of a grade of 0 on the quiz to an F in the course (at my discretion).

What is the Make Up Policy?

It's expected that technical difficulties, illness, or attention to family matters may get in the way of completing your work from time to time. With these considerations in mind, I will be dropping several assignments for such cases as listed below:

- FlipIt Physics Pre-lecture, Checkpoints and Homework: Earning 80% of possible points on FlipIt prelectures/checkpoints and FlipIt HW will get you full credit (Examples: You earn 84% of possible HW points? That becomes 100%. You earn 71% of possible HW points? That becomes $(71/80)*100\% = 89\%$.) In addition, completing FlipIt HW late (by Saturday 11:59 PM instead of Thursday 11:59 PM) gets you 80% of possible points; if your HW is always late and always perfect you'll end up with a 100% HW grade.
- Class Video Questions: Your lowest three class video quizzes will be dropped.
- Discussion: No make-up discussions allowed, but the lowest two discussion scores will be dropped.
- Weekly Quizzes: In a usual semester with face-to-face exams, I would never dropped any exams. However, due to the course being entirely online and potential problems arising from the quizzes being online (i.e. internet connectivity issues, computer glitches, etc.), I will be dropping the two lowest quiz scores. This means there will be no make up quizzes for any reason even in instances where you are not able to take the quiz due to a computer or internet problem. In the unlikely event that you are unable to take three quizzes, a proctored make up quiz will be given at my discretion.
- Final Exam: No make up for the final exam will be given.

Do let me know as soon as you can of any documented extended illness or family responsibilities that may impact your ability to keep up in the class, and we'll try to make a plan to keep you on track to succeed!

What is the Instructor's Email Policy?

- E-mail is not a good way of addressing physics related questions and I will **not** address such questions by e-mail. Physics questions are best answered synchronously during my office hours, during discussion, with TAs during their office hours, or at a SI/PASS session. Another option is to ask questions asynchronously by using VoiceThread or the Discussion Board (see the [Where are the Course Resources and Extra Help?](#) section).
- Email is — however — a great method for non-physics questions such as grades or the course schedule. Please include your full name, course number, and use your UMBC email address to ensure a prompt response.

What is the Academic Integrity Policy?

All instances of academic misconduct will be addressed according to the UMBC Policy on [Academic Integrity](#). Examples include attempting to make use of disallowed materials on quizzes, attempting to communicate with anyone other than the instructor or TA during a quiz, soliciting help by posting material on the internet, altering graded work and submitting it for regrading, asking someone else to take homework, discussion, quiz, etc in your place, copying another's work on homework/quiz, asking someone else to do homework/quiz and representing

it as your own, and permitting or assisting another student to carry out any of the above. Penalties range from a grade of 0 on the assignment to an F in the course (at my discretion), and from denotation of academic misconduct on the transcript to expulsion (as determined by official hearing of the Academic Conduct Committee).

What is the Student Disability Services (SDS) Policy?

UMBC is committed to eliminating discriminatory obstacles that may disadvantage students based on disability. Services for students with disabilities are provided for all students qualified under the Americans with Disabilities Act (ADA) of 1990, the ADA of 2009, and Section 504 of the Rehabilitation Act who request and are eligible for accommodations. The Office of Student Disability Services (SDS) is the UMBC department designated to coordinate accommodations that would allow students to have equal access and inclusion in all courses, programs, and activities at the University.

If you have a documented disability and need to request academic accommodations for access to your courses, please refer to the SDS website at sds.umbc.edu for registration information and to begin the process. For questions or concerns, you may contact them through email at disAbility@umbc.edu or phone (410) 455-2459. If you require accommodations for this class, make an appointment to meet with me to discuss your SDS-approved accommodations.

What is the Discussion Schedule?

Below is the schedule for the discussion sections. You **must** attend the discussion for which you are registered. The discussions will be taking place on Blackboard Collaborate.

COMING SOON!

The TAs* for each discussion section are listed first, followed by the LAs.

What is the Class, Discussion, and Quiz Schedule?

Week (Dates)	FlipIt Unit Class Video Material	Textbook Chapter (Supplemental Material)	FlipIt Unit Discussion	FlipIt Unit Quiz
1 (Aug 24-28)	Course Overview		No Discussion!	No Quiz!
2 (Aug 3 - Sep 4)	1 & 2	17 & 20	1 & 2	1 & 2
3 (Sept 7-11)	3	18	No Discussion!	No Quiz!
4 (Sept 14-18)	4 & 5	19 & 21	4 & 5	3-5
5 (Sept 21-25)	6 & 7	22	6 & 7	6 & 7
6 (Sept 28 - Oct 2)	8	22	8	8
7 (Oct 5-9)	9 & 10	23	9 & 10	9 & 10
8 (Oct 12-16)	11 & 12	24	11 & 12	11 & 12
9 (Oct 19-23)	13 & 14	25	13 & 14	13 & 14
10 (Oct 26-30)	15 & 16	25 & 26	15 & 16	15 & 16
11 (Nov 2-6)	17 & 18	26 & 27	17 & 18	17 & 18
12 (Nov 9-13)	19	27	19	19
13 (Nov 16-20)	20 & 21	28	20 & 21	No Quiz!
14 (Nov 23-27)			No Discussion	20 & 21 (Monday!)
15 (Nov 30 - Dec 4)	22	28	22	22
16 (Dec 7-11)	Review		No Discussion	No Quiz
17 (Dec 14-18)	Final Quizzes 12/16 1-3 PM			

This is the schedule as of the beginning of the course. It is tentative and may be adjusted throughout the semester as needed by the instructor. See the schedule on FlipIt for the most updated schedule and announcements on BB for changes to the schedule.