

Syllabus: PHY 2130, Sections 001, 002, 007 and 008, Winter 2015

This Syllabus covers algebra-based General Physics 2130 Sections 001, 002, 007 and 008 and the associated LL Discussion Sections, although there will also be a separate Syllabus for your Discussion Section. The website for this course is on WSU Blackboard, *Winter 2015 PHY 2130 Sec 001, 002, 007 and 008 (COMBINED)*. The course covers Mechanics, Fluid Mechanics, Oscillations and Mechanical Waves, and Thermodynamics. The prerequisites are High School algebra and trigonometry (but a prior Physics course is not required).

These sections of PHY 2130 meet Mondays, Wednesdays and Fridays 10:40 - 11:35AM for class, in 2009 Science Hall. Discussion Sections are for active problem solving and quizzing, and meet as follows, starting the first week of classes:

LL Sections	Section	CRN	Room	TA
Tuesday, 9:35 AM	001	25969	1111 Old Main	Christopher Clarke
Tuesday, 9:35 AM	007	26509	1114 Old Main	Kulwinder Dhindsa
Wednesday 11:45 AM	002	25970	0149 Education	Christopher Clarke
Wednesday 11:45 AM	008	26511	0155 Education	Kulwinder Dhindsa

LATE START? If you registered for this class after Sat January 10, you need to:

1. Email me (David Bowen) with your WSU AccessID so that I can set up your WebAssign account
2. (depending on date) email me to open up any past-due WebAssign assignments so you can do them
3. (depending on date) get an iClicker2 and register it for this course on Blackboard
4. (depending on date) catch up on past class notes and readings, including reading this Syllabus
5. Contact your Discussion Group TA about assignments and joining a team.

NOTE 1: The Lab course, PHY 2131, is a separate course, with a separate Syllabus, schedule, Instructor and grades. The content of the labs is consistent with PHY 2130, but the sequence is different. PHY 2131 Labs begin during the third full week of classes, the week of January 26.

NOTE 2: The last day to withdraw from a WSU class is Sunday March 29.

PHY 2130 Instructor for this section: David Bowen / d.r.bowen@wayne.edu / cell phone: 248-217-1316

CAMPUS

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666 West Hancock
Detroit, MI 48202
313-577-1498

HOME

4704 Elmhurst Avenue
Royal Oak, MI 48073
248-549-8518
Skype ID: drbowen

Office Hours: Mon 2 – 4 PM & Wed 12:15 – 2:15 PM in 216 Physics (walk-in)

Getting help from me: Or call, email or text, or set up an appointment. It's easy!

Or you can just drop in, but outside of office hours I may not be in my office.

You can also get advice and help via telephone, Face Time or Skype.

Learning outcomes: The learning outcome for of this course, which is the traditional goal in Physics, is that you be able to apply basic physical laws to analyze real-life or unstructured situations (“word problems”), both descriptively and numerically, at least for the aspects covered in this course, which are (a) linear motion, (b) rotational motion, (c) energy conservation, (d) momentum conservation, (e) fluid dynamics, (f) waves, and (e) thermal physics. You should be able to analyze both existing situations, and situations that you or someone else want to construct. Research and experience indicate that, to get to this point, you also need to be able to:

- State and paraphrase definitions and laws, and apply them in simple cases

- Have opportunity to practice, with feedback (e.g. homework) before exams.

Consequently, homework, quiz and clicker questions will also include such questions.

Your success: I want you to succeed in this course, and I believe that you *can* succeed. While there might be barriers to success along the way, there is also help available to overcome these barriers. You should take the help that you need to succeed. See the details near the bottom of Pg 5.

Discussion Sections: The weekly Discussion Sections are a required and integral part of this course. You will be part of a team of (usually) five students, and our intent is that each team will work together to learn Physics. The learning here will be active; that is, you will not be watching someone else and copying them, but you will be actively learning as a team. You should find support from the facilitators (TAs and Peer Mentors), and from the materials you will be required to have on hand, but the facilitators are asked to give you hints about what to do instead of directly telling you. The showing should happen in this class, and part of my expectation is that you will ask questions in class if you do not see how to apply the material. You should not let something go by without understanding how to use it. Each week, one problem you do in Discussion Section will be emailed to me for grading (see Framework Assignment under Homework, below).

Course Materials:

- Text – Physics, 2nd Edition by Giambattista, Richardson and Richardson, published by McGraw Hill, available in the Barnes and Noble campus bookstore. This is also the textbook for PHY 2140. Other editions and used textbooks may also be available, including a one-semester version if you will not be taking PHY 2140.
- WebAssign access card. WebAssign is an online homework system, at www.webassign.net. A two-semester WebAssign access card is included in the price of a new textbook purchased at the BN campus bookstore, or, if you are not getting a new textbook from this bookstore, available separately from the Barnes and Noble campus bookstore. Or, pay online at www.webassign.net. If you pay online, make sure to select the above Giambattista, Richardson and Richardson Physics textbook, 2nd edition. There is a link to WebAssign on the Blackboard website for this course.
- i>Clicker2 remote (“clicker”). Note that it is the i>Clicker2 with numeric capacity that is required, not the i>Clicker. Follow the directions on the Blackboard website for this course to enroll your clicker in this course. Registered clicker needed by Class 3 on Friday, 1/16.
Clicker Problems? (a) if you forget your clicker, you should ask to borrow one of the spares I carry before the start of class. (b) If your clicker batteries run out, I will generally have spare batteries with me, that you can borrow for the length of the class.

On Blackboard: the following additional documents are on Blackboard for your use, under “Content:” “Seven Things to Know About College,” “WebAssign tricks and tips” and “Getting Started With Physics Problems.”

Class Notes: The PowerPoint notes for each class will normally be available on the Blackboard website for this course, before the class, for you to review and print. A good format is to print from the File menu. Under “Print what:” choose “Handouts” and print either four or six slides to the page (I use 6).

Frameworks. “Frameworks” is my name for a “top-down” method of applying Physics (for example, in doing problems) and using methods and equations that are always correct (most other methods and equations are only correct under specific conditions). These methods are described in the textbook, Chapter by Chapter, and I have collected them in the Framework Document and a related Details Document, both on Blackboard under “Content”. Experience indicates that you can be successful in using this approach right from the start, but that if you try other methods, you need to do something like a thousand or even more problems to become successful (that is, to get a good grade).

5 types of Homework:

1. WebAssign Homework: Each week, several WebAssign problems will be assigned for credit. All problems for each week are due Sunday of that week, but are due on Thursdays for weeks before exams. You “do” a WebAssign problem by logging in to the WebAssign site (www.WebAssign.net), reading the problem, working it out on the side, and submitting the answer on the website. I allow you five submissions for each problem, to get the answer right. You will lose 5% for each submission after the first.

Extra Submissions: After the five original submissions, send me an email explaining in detail what you would do on the next attempt (see “Requesting Another Submission” on Blackboard under “Content”). After we have agreed on how to do the problem I will give you an additional submission, with 5% less credit each attempt. You can make more requests for the same problem, with a separate email request each time.

Deadline Extensions: You can give yourself a brief deadline extension (ending 24 hrs after the original deadline), using the link at the bottom right of each assignment page. After that, request additional deadline extensions by email to me. Extensions do NOT require explanation of your answer and they do not require an excuse; a simple request is enough.

Your Webassign account will be set up by the start of classes (not before). Your login information is:

- UserID: First initial and full last name, up to a maximum of eight characters total, excluding any special characters such as periods or dashes. For example, my name is David Bowen, so my UserID would be dbowen
- Institution: wayne (just that, not Wayne State University or anything else)
- Password: AccessID, for example aa2012 for me, since my WSU email address is aa2012@wayne.edu.

2. Framework Assignment: each week in Discussion Section, the first assigned problem will be a “Framework Problem.” This means that you should do that homework problem following the framework that applies, from the list of Frameworks in “Frameworks for PHY 2130 / Winter 2015” on Blackboard under “Content.” In solving that week’s Framework Assignment, be sure to include (a) the name of the framework (from the Frameworks Document) that applies to that problem, (b) the main framework equation and the steps to apply it to this problem, and (c) that equation with the textbook numbers (not WebAssign numbers) substituted, and (d) the solution. By the day after the Discussion Section, each team (not each student) should email me the team’s solution as a good-quality photo or scan, for me to grade. In the email, include the chapter and problem number, and the names of your team members. For help on how to apply the framework, see the “How to use this” section for most of the frameworks on the sheet.

3. Framework problems: Framework problems on WebAssign are direct applications of the major frameworks main equation and are usually too simple to be included in textbooks and problem websites (so you really should pay attention when I show how to do them). These are part of the normal WebAssign assignments, but you can identify them by “framework” on the right side of the blue bar above each problem.

4. Worksheets: Periodically, unannounced, during the semester, there will be a stack of handouts waiting at the front of the classroom. Pick up one of these on the way to your seat. The handouts are worksheets for a framework solution that we will go through in class, or are to be done as homework. There will be two copies of each worksheet in each handout. One copy is for you to fill out and turn in during class; the second copy is for you to fill out and keep, as a record of the framework solution process; that is, the steps that you follow in solving a problem using that framework. There will be no makeups for these worksheets.

5. Non-credit problems and Conceptual questions: Non-credit problems are posted by textbook

Chapter on WebAssign and a list of non-credit conceptual questions from the textbook is posted on Blackboard under “Content > Exams”. These problems (both types) will show up on Exams (see below).

NOTE 1 on Homework and Exam Problems: The Exams will be mostly problems (plus a few definitions, formula statements and so forth, and some of the clicker questions, and questions about what steps to follow in using some of the frameworks), modified as in the list of options listed below. There is NO WAY that you will be able to do the modified problems on the Exams without practicing doing problems ON YOUR OWN, first. You might try to memorize how to do each assigned homework problem but at least some of the Exam problems will be of types that you have not exactly seen before. In doing the homework, your goal should be to understand how to apply the basic frameworks or theories to solve problems. If you can apply the basic frameworks, on your own, for situations that you have not see before, then you should be able to do all of the Exam problems.

NOTE 2 on Homework Problems: Each semester I hear from some people that they spend hours on the problems without making much progress. This is a waste of time and even counterproductive; instead get help. And I do not think you are trying hard unless you also contact me about doing the problems.

NOTE 3 on Homework Problems and Exams: Normally, you must complete the graded homework assignments covered on an exam with a minimum average of 75% by the time of the review session, in order to qualify for having your Exam count. For the first Exam only, if you miss this requirement, take the exam anyway and you will have one week to bring your homework average up to 75%. Note that you will have to ask to have the homework assignments opened up for you.

EXAMS: There will be three 50-minute exams in class, consisting of multiple choice questions (no partial credit), one question about using a framework, and one open-ended problem (write out a solution). The lowest exam score may be replaced using your score on the Final Exam. **Therefore, no makeup exams will be given.** Bring your Wayne State ID to the exam and present it to a proctor if asked during the exam. **A group photograph of the class will be taken during each exam.** No electronic devices (other than a calculator) are allowed in the room during the exam (**no iPods, headphones, cell-phones, Blackberries, etc.**). You will need a stand-alone calculator (“standalone” excludes calculators on cell phones, for example).

Exams will be based on the WebAssign problems (graded and non-graded together), the framework problems, clicker questions and the conceptual questions, all modified using the methods below:

- A. No change
- B. Numbers changed (what WebAssign does)
- C. Setup changed (e.g. decel instead of accel, motorcycle instead of car etc.)
- D. Solve for different variable (possibly using a different equation)
- E. Part of a problem
- F. Combinations
- G. For Exams, multiple choice

NOTE 1: To see specific examples of a transformed problem, see the document “Examples of a transformed problem for Exams” on Blackboard under “Content > Exams”.

NOTE 2: If you have “test anxiety” (as an extreme example, sweating or shaking or extreme nervousness during exams), to the degree that you cannot apply your knowledge, there is help and you should get help before the first exam. There are two links on Blackboard, one to a helpful website and a second to the workshops at the WSU Academic Success Center, some of which are on test anxiety.

NOTE 3: Framework problems will be on Hour Exams but may not be included on the Final Exam. You will know this well before the Final.

NOTE 4: Hour Exam grades will be curved to a class average of 70 points using a formula that keeps 100 (perfect) at 100 but brings the average up to 70. All sections of PHY 2130 will do this. However, on the Final, the curving will be done over all sections as one big group.

NOTE 5: Special rules will be in force for the end of exams, to streamline turning in exams. The rules will be put on Blackboard in advance. One point of the 100 exam points will be for following the rules.

NOTE on Discussion Section Grades: If Discussion Section grades have averages that are not close to each other, I will curve them to be similar. This means that if your Discussion Section has a high average, this will be curved down.

Clicker Questions: Starting Friday 1/16, there will be one or more clicker questions per class. Getting the right answer for a clicker question will count one clicker point, and in addition you will get one clicker point for answering any clicker question, whether the answer is right or wrong (participation).

Reading Quizzes: Each week there will be a Blackboard reading quiz on those pages in the textbook listed in “Where to Start” (part of the class PowerPoint notes) for that week’s assignment. The reading quizzes will be timed.

Syllabus Quiz: There will be a Blackboard quiz on the Syllabus, probably by Wednesday Jan 14. Details will be emailed and announced in class on Monday Jan 12. The possible questions for the Syllabus Quiz are on Blackboard under “Content.” The Quiz will count as part of the regular reading quizzes.

Extra Credit for Attending a Planetarium Session: The WSU Planetarium runs shows for students. You will get 1 point of extra credit for attending one of these during the semester. Be on time; doors close promptly. You will sign an attendance sheet – if you enter the wrong instructor or your writing is unclear, you may very well miss the credit, so know your instructor and course name (Bowen, PHY 2130), and write clearly. (BTW, I have been told that this can be a good cheap date opportunity. Guests are welcome, but there may not be room for large groups.)

Grading: Your course grade will be determined by your performance on the three midterm Exams, Online Homework, Discussion Section results, clicker performance reading quizzes and the Final Exam. The Final Exam will cover the material presented during the entire semester. The overall course grade will be determined on the basis of the following distribution:

- Three In-class 50 Minute Exams (16 points each) 48 points
 - Discussion Section grade 15 points (10 pts for Quiz average + 5 pts for Participation.)
 - Final Exam 30 points
 - WebAssign/reading quizzes/frameworks/worksheets/clickers 2/1/1/1/2 points
 - Extra credit for attending a WSU Planetarium session 1 point
- Total 100 points (+ 1 extra credit)**

Points	Grade
90-100	A
85-89	A-
80-84	B+
75-79	B

70-74	B-
65-69	C+
60-64	C
55-59	C-
50-54	D+
45-49	D
40-44	D-
0-39	F

HONORS CREDIT: Information on Honors Credit for this course is on Blackboard under "Content."

Your success, continued: Here are some of the possible barriers to your success in this course:

- Poor background. A Physics background is NOT necessary for PHY 2130, but quick and reliable algebra and trigonometry are. There are reviews of algebra and trig at the back of the textbook.
- Test Anxiety. Some anxiety about tests is probably inevitable, and a manageable level of stress can even help your performance - use it! But if you experience anxiety levels that hurt your performance, you need help with that.
- Study skills. You may be putting in a lot of time "studying," but in ways that do not actually help you do better. For example, you should practice what you will actually be asked to do on exams, which for this course is to solve Physics problems that you have not exactly seen before. Another thing that helps is reviewing regularly, perhaps right after class. Studying an existing solution is not much help, because on exams you will be solving problems on your own.
- Time management. A student with a full load has a full plate, and the same for a smaller load and a job. Worrying about that load is not productive. Spending your time wisely and productively is what you need to do.
- Help with Physics content and problems.
- You may also have a disability, which would affect your work in *all* courses. Student Disability Services (see below under "Disability") will help you in deciding this, and in getting an accommodation to enable your success.

I want you to succeed in this course, and the University also wants you to succeed. I invite you to explore any of the above situations with me or to get a reference to the corresponding University program, in confidence. My ambition is not to be your enemy, but to be a helper on your way forward. The important thing is to work on overcoming any barriers as soon as possible in the semester, so that you do not dig a hole from which it can be difficult to climb out. Some of the University programs are also described further below.

Additional Study Help: If you have difficulty doing homework or lab work, or understanding some of the course material, you can get help from the *Physics Resource Center*, in room 172 Physics Building. The center will open a couple of weeks after the beginning of the semester.

Supplemental Instruction: We also expect to have Supplemental Instruction for PHY 2130 this semester. This is no-cost voluntary group tutoring sessions sponsored by the WSU Academic Success Center with a trained student who got an excellent grade in the course earlier. Watch for emails from the student SI leader.

The Academic Success Center (1600 Undergraduate Library) assists students with content in select courses, in test anxiety and in strengthening study skills. Visit www.success.wayne.edu for schedules and information on study skills workshops, tutoring and supplemental instruction (primarily in 1000 and 2000 level courses).

Disability: If you feel that you may need an accommodation based on the impact of a disability, please feel free to contact me privately to discuss your specific needs. Additionally, Student Disability Services (SDS, formerly the Office of Educational Accessibility Services), coordinates reasonable accommodations for students with documented disabilities. The office is located in 1600 UGL, phone: 313-577-1851 (Voice) / 577-3365(TTY), web site <http://studentdisability.wayne.edu/>.

Responsibility for Work: Whether on homework or an exam, I will never take seriously a statement such as, "but that's how (another student or someone in the Resource Center or anyone else) told me to do it." Your work is your own, and you should always try to tie the solution back to the fundamental laws. You can always check with me.

Religious Holidays: Because of the extraordinary variety of religious affiliations of the University student body and staff, the Academic Calendar makes no provisions for religious holidays.

However, it is University policy, to respect the faith and religious obligations of the individual. Students with classes or examinations that conflict with their religious observances are expected to notify their instructors well in advance so that mutually agreeable alternatives may be worked out.

Course Drops and Withdrawals: In the first two weeks of the (full) term, students can drop this class and receive 100% tuition and course fee cancellation. After the end of the second week there is no tuition or fee cancellation. If you want to withdraw, you are required to first go through a counseling procedure, after which you file a withdrawal request on Pipeline. I am then supposed to talk with you before acting on your request. You can read more about this at

<http://go.wayne.edu/smart>. You will receive a transcript notation of WP (passing), WF (failing), or WN (no graded work) at the time of withdrawal. No withdrawals can be initiated after the end of the tenth week. Students enrolled in the 10th week and beyond will receive a grade. Directions for filing a withdrawal request on Pipeline are at <http://reg.wayne.edu/pdf-policies/students.pdf>.

Grade Appeals: You can appeal the final course grade in this, or any other, course. Your first appeal is to the Instructor (me), informally or verbally first, then formally, in writing. After that, the appeal process within the College of Liberal Arts and Sciences (CLAS) is described at http://www.clas.wayne.edu/Multimedia/CLAS/files/Students/Grade_Appeal_process.pdf. This document also describes the criteria for grade appeals, including appeals to the Instructor.

Plagiarism: In general, plagiarism is presenting someone else's work as your own, whether on purpose or through negligence. For a more detailed discussion, see <http://www.is.wayne.edu/Policies2/Plagiarism.htm>. In this course, for the first instance of plagiarism, the work will be graded down 40%. For the second instance, the assignment will be failed with a zero, and for the third, the course will be failed. In each case, including the first, a memo will be sent to the Physics Department describing the circumstances.

The most important consequence of plagiarism, whether or not it is detected, is that you will not be able to do the work, and moreover you will not have the confidence that you can do that part of the work. One of the primary benefits of college is the confidence to step up say, "I can do that," and this is also the source of many of the other benefits. You may "get away" with plagiarism, but the main penalty, far worse than any grade punishment, is that your college education, which is one of the best things you can do for yourself, will not have these benefits that you are looking for.

Skipped sections (see "Topics" column) will not appear in class, homework, quizzes or exams.

Week	Class	Date	Day	Topics	Read sections:
1	1	1/12	M	Intro, Scientific Notation, Sig figs	Syllabus
	2	1/14	W	Units, Approximation, Graphs, Displacement, Velocity	1.1 - 1.8
	3	1/16	F	(iClicker) Acceleration, constant acceleration (last day to add)	1.9 - 2.2
2		1/19	M	No classes (Martin Luther King Day)	
	4	1/21	W	Free fall	2.3 - 2.5
	5	1/23	F	Vectors, vector displacement and velocity	2.6 - 3.2
3	6	1/26	M	Motion with constant vector acceleration (skip 3.6)	3.3 - 3.5
	7	1/28	W	Forces: Newton's Laws	4.1 - 4.4
	8	1/30	F	Forces: gravity and contact (normal, 2 types of friction)	4.5 - 4.6
4	9	2/2	M	Forces: tension & using Newton's Second Law	4.7 - 4.8
	10	2/4	W	Reference frames & apparent weight (skip 4.11 & 12)	4.9 - 4.10
	11	2/6	F	Review for Exam 1	1 - 4.8
5	12	2/9	M	Exam 1 (Chpts 1 - 4)	1 - 4.8
	13	2/11	W	Circular motion, radial acceleration, curves	5.1 - 5.3
	14	2/13	F	Circular orbits, artificial gravity, conservation of energy (skip 5.5 & 6)	5.4, 5.7, 6.1
6	15	2/16	M	Kinetic and potential energy, gravitational potential energy. Deadline for 75% WebAssign to have Exam 1 count	6.2 - 6.4
	16	2/18	W	Gravitational and spring potential energy	6.5 - 6.7
	17	2/20	F	Power, momentum conservation.	6.8 - 7.3
7	18	2/23	M	Momentum conservation, center of mass (skip 7.6)	7.4 - 7.5
	19	2/25	W	Collisions, rotational energy and inertia	7.7 - 8.1
	20	2/27	F	Torque, work done by torque	8.2 - 8.3
8	21	3/2	M	Rotational equilibrium, equilibrium in the human body	8.4 - 8.5
	22	3/4	W	Rotation, gravity and pressure (skip 8.7, 8.9)	8.6 - 9.3
	23	3/6	F	Review for Exam 2	4.9 - 8.5
9	24	3/9	M	Exam 2 (Chpts 5 - 8)	4.9 - 8.5
	25	3/11	W	Gravity and pressure	9.4 - 9.6
	26	3/13	F	Fluid flow, Bernoulli's Eqn., viscosity	9.7 - 9.9
	Mon 3/16 - Sat 3/21			Spring Break	
10	27	3/23	M	Elastic deformation, Hooke's Law, period and frequency (skip 9.10 & 11, 10.3 & 4 - all are on MCAT)	10.1 - 10.6
	28	3/25	W	Pendulum, waves (skip 10.9 & 10)	10.8 - 11.2
	29	3/27	F	Superposition & examples, standing waves. (skip 11.5, 11.9)	11.3 - 11.10
11	30	3/30	M	Sound waves, amplitude and intensity	12.1 - 12.3
	31	4/1	W	Hearing, Beats	12.4 - 12.7
	32	4/3	F	Doppler effect, sound applications, temperature	12.8 - 13.3
12	33	4/6	M	Absolute temperature, Ideal Gas Law	13.4 - 13.5
	34	4/8	W	Kinetic Theory, internal energy, heat (skip 13.7 (on MCAT under Chemistry) & 13.8)	13.6 - 14.2
	35	4/10	F	Review for Exam 3	8.6 - 12
13	36	4/13	M	Exam 3 (Chpts 9 - 12)	8.6 - 12
	37	4/15	W	Specific heat, phase transitions, thermal conduction	14.3 - 14.5
	38	4/17	F	Heat conduction, convection and radiation	14.6 - 14.8
14	39	4/20	M	First Law of Thermodynamics, thermodynamic processes	15.1 - 15.3
	40	4/22	W	Heat engines, Entropy, 3 rd Law of Thermo (skip 15.6 & 7)	15.4 - 15.9
	41	4/24	F	Catch-up	
15	42	4/27	M	Review for Final	All
		4/28	T	Study Day, no classes	

Tuesday May 5: cumulative common Final Exam (1:20 - 3:50 PM) in 100 General Lectures