

PURDUE UNIVERSITY – PHYS 172: MODERN MECHANICS

SPRING 2025 COURSE SYLLABUS & SCHEDULE

COURSE CREDIT HOURS: 4

PREREQUISITES: MA 161 or equivalent (may be taken concurrently)

INSTRUCTIONAL MODALITY: Face-to-Face

COURSE EMAIL: phys172@lists.purdue.edu

This is the official, common email for the course for any questions related to any of the course components (lectures, recitation, laboratory, homework, exams) or questions related to the course syllabus and/or schedule, study tips or help, etc. Course coordinators, Lecturers, or Graduate Teaching Assistants may respond to your email. Emails are typically read 8:00 a.m. to 5:00 p.m. EST daily and we will do our best to respond within 24 hours. Please be flexible with these times before deadlines and exams and on weekends or holidays. The subject line of the email must start with **PHYS 172**: Following this, please include the topic of your query (i.e., HW, Lecture, Recitation, Lab, Quiz, Exam, etc.). If you have a DRC, personal concern, or any email of a personal nature, please contact any of the Course Coordinator directly. Emails concerning medical information need to be directed to the ODOS staff, per Purdue policy.

COURSE LEARNING GOALS: After completing this course, you should be able to.

- **Identify, describe, and explain** three fundamental physical *principles*: Momentum, Energy, and Angular Momentum.
- **Identify and explain** the *models* -- point particle or extended systems – that are used to **describe** physical situations.
- **Identify** useful *approximations* and *assumptions* that are relevant to physical situations.
- **Analyze** physical situations and contexts in terms of *systems* and *surroundings*.
- **Apply** the three *principles* to the *model* of physical *system* and *surroundings* in the context of appropriate *assumptions* and *approximations* to determine unknown physical variables, based on known physical variables.
- **Evaluate and argue** whether you have appropriately *analyzed* a physical situation in terms of the system and surrounding, *identified* the model for the system, *identified* reasonable approximations and assumptions, necessary to *apply* one or more of the three fundamental principles.
- **Design** real-world situations in which you can **formulate** a process to determine one or more unknown variables by **applying** one or more of the three fundamental *principles* to **analyze** the physical situation by **identifying** the *system* and *surroundings* based on **identifying** appropriate *assumptions* and *approximations*.

COORDINATORS:

COURSE COORDINATOR

N. Sanjay REBELLO (rebellos@purdue.edu)

WebEx Office: <https://purdue.webex.com/meet/rebellos>

Office: Room 232, PHYS

Office Hr.: WED. 10:30 – 11:30 AM or by Appointment.

Phone: 785-537-7543 (Cell) – For Emergencies Only

COORDINATOR OF DIGITAL INSTRUCTION

David HUCKLEBERRY (dhuckleb@purdue.edu)

WebEx Office:

<https://purdue.webex.com/meet/dhuckleb>

Office Hours: by Appointment.

LECTURES: ALL LECTURES ARE ON TUESDAY & THURSDAY

SEC	TIME	ROOM	INSTRUCTOR (email@purdue.edu)	OFFICE	OFFICE HRS. (or Appt.)
068	08:30	PHYS 114	Dr. Valentin WALTHER (vwalther@purdue.edu)	PWL WTHR 265B	Wed 11:00 AM – 12:00 PM
069	09:30	PHYS 114			
070	10:30	PHYS 114	Dr. Laimei NIE (nlm@purdue.edu)	https://purdue-edu.zoom.us/j/7665810236	Mon 12:30 PM – 1:30 PM
071	11:30	PHYS 114	Dr. Yulia PUSHKAR (ypushkar@purdue.edu)	PWL PHYS 070	Tue. 4:00 PM – 5:00 PM
072	12:30	PHYS 114			
073	01:30	PHYS 114	Dr. Mark KLEHFOTH (mklehfot@purdue.edu)	https://purdue-edu.zoom.us/j/96607689469	Fri 4:00 PM – 5:00 PM
105	02:30	PHYS 114			
098	10:30	PIN LE 100	Dr. Jeffrey GERBER (gerber48@purdue.edu)	PIN IO Building Rm. 253	Wed 11:30 AM – 12:30 PM
114	11:30	PIN LE 100			

RECITATION INSTRUCTORS (By Section)

REC#	DAY	TIME	ROOM	REC GTA (email@purdue.edu)	REC UTA (email@purdue.edu)
R034	T	7:30	PWL PHYS 238	ULATE, CHRISTOPHER (culate)	Yadav, Saachika (yadav104)
R035	T	8:30	PWL PHYS 238	ULATE, CHRISTOPHER (culate)	Cessa, Isabella (icessa)
R036	T	9:30	PWL PHYS 238	ULATE, CHRISTOPHER (culate)	Cessa, Isabella (icessa)
R037	T	10:30	PWL PHYS 238	GHIMIRE, ROJILA (rghimire)	Cessa, Isabella (icessa)
R038	T	11:30	PWL PHYS 238	GHIMIRE, ROJILA (rghimire)	Mahoney, Ryan (mahone42)
R039	T	12:30	PWL PHYS 238	BRALIN, AMIR (abralin)	Mahoney, Ryan (mahone42)
R040	T	1:30	PWL PHYS 238	BRALIN, AMIR (abralin)	Morrin, Keira (kmorrin)
R041	T	2:30	PWL PHYS 238	BRALIN, AMIR (abralin)	Sundar, Abhaya (sundar51)
R042	T	3:30	PWL PHYS 238	MANSUKHANI, ADHYAN (amansuk)	Sundar, Abhaya (sundar51)
R044	T	4:30	PWL PHYS 238	MANSUKHANI, ADHYAN (amansuk)	Katta, Ritvik (katta9)
R045	W	7:30	PWL PHYS 238	SINGER, NOAH (singer38)	Sundar, Abhaya (sundar51)
R046	W	8:30	PWL PHYS 238	SINGER, NOAH (singer38)	Metz, Sydney (metzs)
R047	W	9:30	PWL PHYS 238	SINGER, NOAH (singer38)	Tripanish, Wisumitra (wtirapan)
R048	W	10:30	PWL PHYS 238	ULATE, CHRISTOPHER (culate)	Morrin, Keira (kmorrin)
R049	W	11:30	PWL PHYS 238	GLOVER, MARLA (mjpglover)	Metz, Sydney (metzs)
R050	W	12:30	PWL PHYS 238	GLOVER, MARLA (mjpglover)	Coleman, Andrew (colem199)
R051	W	1:30	PWL PHYS 238	GLOVER, MARLA (mjpglover)	Coleman, Andrew (colem199)
R052	W	2:30	PWL PHYS 238	ALLEN, WINTER (allen564)	Metz, Sydney (metzs)
R054	W	3:30	PWL PHYS 238	ALLEN, WINTER (allen564)	Tripanish, Wisumitra (wtirapan)
R055	W	4:30	PWL PHYS 238	ALLEN, WINTER (allen564)	Tripanish, Wisumitra (wtirapan)
R056	Th	7:30	PWL PHYS 238	ALLEN, WINTER (allen564)	Sundar, Abhaya (sundar51)
R057	Th	8:30	PWL PHYS 238	ALLEN, WINTER (allen564)	Sundar, Abhaya (sundar51)
R058	Th	9:30	PWL PHYS 238	ALLEN, WINTER (allen564)	Huang, Mei-Ching (huan1880)
R059	Th	10:30	PWL PHYS 238	SINGER, NOAH (singer38)	Huang, Mei-Ching (huan1880)
R060	Th	11:30	PWL PHYS 238	SINGER, NOAH (singer38)	Huang, Mei-Ching (huan1880)
R061	Th	12:30	PWL PHYS 238	SINGER, NOAH (singer38)	Tripanish, Wisumitra (wtirapan)
R063	Th	1:30	PWL PHYS 238	GLOVER, MARLA (mjpglover)	Shi, Jason (shi546)
R064	Th	2:30	PWL PHYS 238	GLOVER, MARLA (mjpglover)	Shi, Jason (shi546)
R066	Th	4:30	PWL PHYS 238	GHIMIRE, ROJILA (rghimire)	Mahoney, Ryan (mahone42)
R065	Th	5:30	PWL PHYS 238	MANSUKHANI, ADHYAN (amansuk)	Mahoney, Ryan (mahone42)
R067	F	7:30	PWL PHYS 238	GHIMIRE, ROJILA (rghimire)	Yadav, Saachika (yadav104)
R085	F	8:30	PWL PHYS 238	GHIMIRE, ROJILA (rghimire)	Yadav, Saachika (yadav104)
R087	F	9:30	PWL PHYS 238	GHIMIRE, ROJILA (rghimire)	Morrin, Keira (kmorrin)
R088	F	10:30	PWL PHYS 238	VALADEZ, DENNISE (dvalade)	Morrin, Keira (kmorrin)
R089	F	11:30	PWL PHYS 238	VALADEZ, DENNISE (dvalade)	Coleman, Andrew (colem199)
R097	F	12:30	PWL PHYS 238	ULATE, CHRISTOPHER (culate)	Coleman, Andrew (colem199)
R109	F	1:30	PWL PHYS 238	ULATE, CHRISTOPHER (culate)	Shi, Jason (shi546)
R106	F	2:30	PWL PHYS 238	VALADEZ, DENNISE (dvalade)	Shi, Jason (shi546)
R107	F	3:30	PWL PHYS 238	VALADEZ, DENNISE (dvalade)	Shi, Jason (shi546)
R108	F	4:30	PWL PHYS 238	VALADEZ, DENNISE (dvalade)	Huang, Mei-Ching (huan1880)
R100	T	1:30	PIN ET 202	HASHMI, SYED FURQAN (hashmi0)	---
R099	T	2:30	PIN ET 202	HASHMI, SYED FURQAN (hashmi0)	---
R118	W	11:30	PIN ES 2107	HASHMI, SYED FURQAN (hashmi0)	---
R115	W	1:30	PIN ET 202	HASHMI, SYED FURQAN (hashmi0)	---
R116	Th	9:30	PIN ES 2107	HASHMI, SYED FURQAN (hashmi0)	---
R127	Th	12:30	PIN LD 026	HASHMI, SYED FURQAN (hashmi0)	---
R128	Th	1:30	PIN ET 202	HASHMI, SYED FURQAN (hashmi0)	---

LAB INSTRUCTORS (By Section):

SEC#	DAY	TIME	ROOM	LAB GTA (email@purdue.edu)	LAB UTA (email@purdue.edu)
L001	T	7:30	PWL PHYS 008	SUMMERS, MATT (summer55)	Murphy, Rowan (murph594)
L002	T	7:30	PWL PHYS 018	ZIMMER, NOAH (zimmer74)	Bajagur, Gowri (gbajagur)
L003	T	9:30	PWL PHYS 008	SUMMERS, MATT (summer55)	Mordasiewicz, Alessandro (amordasi)
L005	T	9:30	PWL PHYS 018	SHAFIEPOUR, FERESHTEH (fshafiep)	Shah, Jay (shah953)

SEC#	DAY	TIME	ROOM	LAB GTA (email@purdue.edu)	LAB UTA (email@purdue.edu)
L007	T	11:30	PWL PHYS 008	SUMMERS, MATT (summer55)	Do, Uyen (do83)
L008	T	11:30	PWL PHYS 018	SHAFIEPOUR, FERESHTEH (fshafiep)	Veeredhi, Shreya (sveeredh)
L009	T	1:30	PWL PHYS 008	CHATTA SUBRAMANIAM, RAVI (rchattas)	Young, Brian (young741)
L010	T	3:30	PWL PHYS 008	RATHORE, DIVYANSH (rathored)	Kroll, Felipe (fkroll)
L011	T	3:30	PWL PHYS 018	ZIMMER, NOAH (zimmer74)	Jensen, Mia (jense125)
L012	W	7:30	PWL PHYS 008	ZHOU, SHANGJIE (zhou1468)	Hakimi, Jeremy (jhakimi)
L013	W	7:30	PWL PHYS 018	MIAO, WENLAN (miao74)	Stavig, Vincent (vstavig)
L014	W	9:30	PWL PHYS 008	ZHOU, SHANGJIE (zhou1468)	Kroll, Felipe (fkroll)
L110	W	9:30	PWL PHYS 018	SUMMERS, MATT (summer55)	Morris, Devin (morri699)
L015	W	11:30	PWL PHYS 008	ZIMMER, NOAH (zimmer74)	Young, Brian (young741)
L016	W	11:30	PWL PHYS 018	MIAO, WENLAN (miao74)	Mordasiewicz, Alessandro (amordasi)
L017	W	1:30	PWL PHYS 008	ZIMMER, NOAH (zimmer74)	Teng, Deimos (teng40)
L018	W	1:30	PWL PHYS 018	MIAO, WENLAN (miao74)	Shah, Jay (shah953)
L019	W	3:30	PWL PHYS 008	ALVI, SULAIMAN (alvi3)	Nadig, Simran (snadig)
L020	W	3:30	PWL PHYS 018	DAWSON, LINDSAY (dawson99)	Stavig, Vincent (vstavig)
L021	W	5:30	PWL PHYS 008	ALVI, SULAIMAN (alvi3)	Trajkovic, Tatjana (ttrajkov)
L022	W	5:30	PWL PHYS 018	DAWSON, LINDSAY (dawson99)	Veeredhi, Shreya (sveeredh)
L023	Th	7:30	PWL PHYS 008	DAWSON, LINDSAY (dawson99)	Ohin, Kyle (ohlin)
L025	Th	7:30	PWL PHYS 018	RATHORE, DIVYANSH (rathored)	Chettri, Pratyush (pchettr)
L027	Th	9:30	PWL PHYS 008	DAWSON, LINDSAY (dawson99)	Wei, Serena (wei445)
L028	Th	9:30	PWL PHYS 018	SHAFIEPOUR, FERESHTEH (fshafiep)	Murphy, Rowan (murph594)
L029	Th	11:30	PWL PHYS 008	SENG, SOPHEAK (sengs)	Ohin, Kyle (ohlin)
L030	Th	11:30	PWL PHYS 018	SHAFIEPOUR, FERESHTEH (fshafiep)	Veeredhi, Shreya (sveeredh)
L031	Th	1:30	PWL PHYS 008	SENG, SOPHEAK (sengs)	Ohin, Kyle (ohlin)
L032	Th	1:30	PWL PHYS 018	ZHOU, SHANGJIE (zhou1468)	Veeredhi, Shreya (sveeredh)
L084	Th	4:30	PWL PHYS 008	GLENN, CADEN (glenn10)	Kroll, Felipe (fkroll)
L086	Th	4:30	PWL PHYS 018	ZHOU, SHANGJIE (zhou1468)	Teng, Deimos (teng40)
L090	F	7:30	PWL PHYS 008	ALVI, SULAIMAN (alvi3)	Hakimi, Jeremy (jhakimi)
L091	F	7:30	PWL PHYS 018	NEUPANE, MOHAN (neupanem)	Trajkovic, Tatjana (ttrajkov)
L092	F	9:30	PWL PHYS 008	ALVI, SULAIMAN (alvi3)	Nadig, Simran (snadig)
L093	F	9:30	PWL PHYS 018	NEUPANE, MOHAN (neupanem)	Do, Uyen (do83)
L094	F	11:30	PWL PHYS 008	RATHORE, DIVYANSH (rathored)	Mordasiewicz, Alessandro (amordasi)
L095	F	11:30	PWL PHYS 018	GLENN, CADEN (glenn10)	Young, Brian (young741)
L096	F	1:30	PWL PHYS 008	MIAO, WENLAN (miao74)	Teng, Deimos (teng40)
L111	F	1:30	PWL PHYS 018	GLENN, CADEN (glenn10)	Jensen, Mia (jense125)
L112	F	3:30	PWL PHYS 008	RATHORE, DIVYANSH (rathored)	Bajagur, Gowri (gbajagur)
L113	F	3:30	PWL PHYS 018	GLENN, CADEN (glenn10)	Jensen, Mia (jense125)
L101	T	9:30	PIN IO 276	SAVAGE, SEAN (savage26)	---
L123	T	11:30	PIN IO 276	SAVAGE, SEAN (savage26)	---
L119	T	1:30	PIN IO 276	SAVAGE, SEAN (savage26)	---
L102	W	9:30	PIN IO 276	SAVAGE, SEAN (savage26)	---
L124	W	11:30	PIN IO 276	SAVAGE, SEAN (savage26)	---
L120	W	1:30	PIN IO 276	SAVAGE, SEAN (savage26)	---
L121	Th	11:30	PIN IO 276	CHATTA SUBRAMANIAM, RAVI (rchattas)	---
L125	Th	1:30	PIN IO 276	CHATTA SUBRAMANIAM, RAVI (rchattas)	---
L104	F	9:30	PIN IO 276	BORSE, NIKHIL (nborse)	---
L122	F	11:30	PIN IO 276	BORSE, NIKHIL (nborse)	---
L126	F	1:30	PIN IO 276	BORSE, NIKHIL (nborse)	---

HELP CENTER (PWL PHYS Rm. 290, PIN IO Rm. 276)

TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8:30 AM - 9:20 AM	BASHARULI, NIKA (nbasharu) JO, EUIHYUN (jo76) PWL	BASHARULI, NIKA (nbasharu) AL RUBKHI, ABDUL RAHMAN (aalrubkh) PWL	BASHARULI, NIKA (nbasharu) AL RUBKHI, ABDUL RAHMAN (aalrubkh) PWL	BASHARULI, NIKA (nbasharu) PWL	BASHARULI, NIKA (nbasharu) PWL BORSE, NIKHIL (nborse) PIN
9:30 AM - 10:20 AM	BASHARULI, NIKA (nbasharu) JO, EUIHYUN (jo76) PWL	BASHARULI, NIKA (nbasharu) PWL	BASHARULI, NIKA (nbasharu) AL RUBKHI, ABDUL RAHMAN (aalrubkh) PWL	BASHARULI, NIKA (nbasharu) PWL	BASHARULI, NIKA (nbasharu) PWL
10:30 AM - 11:20 AM	BASHARULI, NIKA (nbasharu) JO, EUIHYUN (jo76) PWL		BASHARULI, NIKA (nbasharu) AL RUBKHI, ABDUL RAHMAN (aalrubkh) PWL		
11:30 AM - 12:20 PM	AL RUBKHI, ABDUL RAHMAN (aalrubkh) HU, XUDONG (hu1027) PWL	AL RUBKHI, ABDUL RAHMAN (aalrubkh) PWL	AL RUBKHI, ABDUL RAHMAN (aalrubkh) PWL	AL RUBKHI, ABDUL RAHMAN (aalrubkh) PWL	
12:30 PM - 1:20 PM	HU, XUDONG (hu1027) XIE, ZHIYAN (xie530) PWL	XIE, ZHIYAN (xie530) AL RUBKHI, ABDUL RAHMAN (aalrubkh) PWL		HU, XUDONG (hu1027) XIE, ZHIYAN (xie530) PWL	
1:30 PM - 2:20 PM	JO, EUIHYUN (jo76) XIE, ZHIYAN (xie530) PWL		AL RUBKHI, ABDUL RAHMAN (aalrubkh) PWL		
2:30 PM - 3:20 PM	JO, EUIHYUN (jo76) XIE, ZHIYAN (xie530) PWL				
3:30 PM - 4:20 PM	JO, EUIHYUN (jo76) XIE, ZHIYAN (xie530) PWL		AL RUBKHI, ABDUL RAHMAN (aalrubkh) PWL		BORSE, NIKHIL (nborse) PIN
4:30 PM - 5:20 PM	AL RUBKHI, ABDUL RAHMAN (aalrubkh) XIE, Z. (xie530) PWL			XIE, ZHIYAN (xie530) PWL	
5:30 PM - 6:20 PM	AL RUBKHI, ABDUL RAHMAN (aalrubkh) XIE, Z. (xie530) PWL				

RECITATION AND LABORATORY SESSIONS:

- **During WEEK 01**, as per the instructions in *Brightspace* ...
 - Please attend your **RECITATION 01 section IN PERSON**. Turn it in by the **DUE TIME** (See *Course Schedule*).
 - Please complete **LAB 01 at home**. Turn it in by the **DUE TIME** (See *Course Schedule*).
 - Attend **BOTH** your **LECTURES 01 & 02**. **Go through the PRE-LECTURE videos beforehand**.
 - Complete **HOMEWORK 01** before the **DUE TIME** (See *Course Schedule*).
- Both **RECITATION** and **LAB** sessions **will meet in person starting WEEK 02** as scheduled.
- The Registrar assigns each student to a specific Recitation and a specific Laboratory section. **You MUST ATTEND YOUR ASSIGNED SECTIONS**. If you attend another Recitation or Lab section, you will receive no credit.
- You can only change your Recitation or Laboratory section through the **Registrar**. If you change your Recitation or Lab section, you must notify the Course Coordinator and GTAs of the section you are leaving and joining.

MATERIALS

- **Matter & Interactions – Volume 1 – Modern Mechanics** (4th Edition), by Chabay and Sherwood (Wiley). You can purchase a used hard copy of the text online. The electronic version of the textbook is also available for purchase (from the Purdue University bookstore) with access code for the online homework system (*WileyPLUS*). If you only wish to use the eBook, you will be able to find the link to purchase this on the *Brightspace* page for this course, and you can purchase it there along with the *WileyPLUS* homework system.
- **iClicker**: Please follow the instructions below carefully.
 - You may use any mobile device that supports iClicker Cloud. You may **NOT use an iClicker remote**.
 - You **MUST** follow the instructions in *Brightspace* and set up your iClicker account using your **PURDUE EMAIL**. If you fail to do this, you may lose the points from the lecture quizzes you have earned as they will not sync properly.
 - **Never use an account that is not yours or ask someone to use yours. This is a violation of the Academic Honesty policy. Anybody found in violation of this policy will receive a failing grade in the course.**
 - You may attend any of the lecture sections. However, you may only answer clicker questions in one lecture. If we find that you have answered clicker questions in multiple lectures on the same day, you will receive no clicker points for that day.

- **WileyPLUS:** You will need an access code from *WileyPLUS* to complete the weekly online homework. You can find the link to purchase this on *Brightspace* on the left-hand panel.
- **Other Materials:**
 - Access to laptop, tablet, or computer. You are required to bring a laptop to each LAB and RECITATION.
 - Access to Word Processor (i.e. MS Word), remember that [MS Office is free for all students](#), PDF converter (free apps can be found)
 - Access to *Brightspace*. This is where all course materials will be provided as well as access to and submission of course assignments.
 - Students are responsible for the maintenance of their devices and software use. ITaP is the resource should you have issues.

DO THESE ASAP!

Please complete the following at the earliest convenience. Please also refer to the Schedule for the exact due dates and times for various assignments.

- Purchase ALL of the materials listed above.
- Go through all the information on the left panel of *Brightspace*.
 - In *Brightspace* in the top menu click on Content and then in the left panel click on **GETTING STARTED QUIZZES**. Therein you will find two Quizzes. **You need to get 100% on BOTH Quizzes. Only if you score 100% on these two Quizzes will you be able to see the COURSE CONTENT (by Week)**
 - In *Brightspace* in the top menu click on Content and then in the left panel click on **WileyPLUS RESOURCES** on the left panel of the course webpage. From here click on the first link “**Purdue Physics 172 and 272 WileyPLUS Registration**” and follow the instructions therein.
 - After you have completed both Quizzes above and scored 100% on both, in the top menu click on Content and then in the left panel click on **COURSE CONTENT (by WEEK)** of the course webpage. Start with **MODULE 1 > WEEK 01**. **You need to complete everything here as per the due dates listed.** Weekly folders will be provided as we progress through the semester.
- **Add iClicker Cloud** via the link in *Brightspace*
- Complete **RECITATION 01 IN PERSON** (See *COURSE SCHEDULE* section in the *Syllabus* for due date and time)
- Complete **HOMEWORK 01** (See *COURSE SCHEDULE* section in the *Syllabus* for due date and time)
- Complete **LAB 01 at home** (See *COURSE SCHEDULE* section in the *Syllabus* for due date and time)

EXAM DATES: IN-PERSON attendance is required for ALL Mid-Term EXAMS and the FINAL EXAM.

- **Mid-Term EXAM 1: 6:30 – 7:30 PM, MONDAY, FEBRUARY 17.**
 - **LOCATION:** PWL: Elliott Hall of Music: Main Floor (ELLT 116). **PIN: LE 101, 100, 102.**
- **Mid-Term EXAM 2: 6:30 – 7:30 PM, MONDAY, MARCH 31.**
 - **LOCATION:** PWL: Elliott Hall of Music: Main Floor (ELLT 116). **PIN: LE 101, 100, 102.**
- **FINAL EXAM: 8:00 – 10:00 AM, THURSDAY, MAY 08.**
 - **LOCATION:** PWL: Elliott Hall of Music: Main Floor (ELLT 116). **PIN: HR 101, IO 105, IT 152, IT 252.**

COURSE OVERVIEW

PHYS 172 is the first semester of calculus-based physics sequence with an emphasis on modern mechanics. Although first semester calculus (MATH 161) is a co-requisite for PHYS 172; calculus concepts will be introduced gradually in this course. Mastery of high school algebra is a prerequisite, and high school physics is recommended but not required.

This is a 4-credit hour course. All the course materials will be distributed online on *Brightspace*. You should anticipate spending about 15 hours per week on average (i.e., about 3 hours each weekday) on this course. This time will be spent on learning from the lectures, homework, recitation, and laboratory assignments, and studying for Quizzes and Exams. This is the *typical, average* time commitment for a student in this course, but the required time commitment to succeed is different for each student. If you are falling behind, you may need to devote more time.

A complete course schedule of class meetings is posted on *Brightspace*. This schedule shows all deadlines. **The Final Exam will be announced by the Registrar. DO NOT make travel plans to leave campus until after the end of Exam Week, to allow for any emergency situations. If you are unable to take the Final Exam, you will receive an Incomplete for the semester and need to take the Final Exam the following semester to resolve the incomplete.**

COURSE CONTENT

Major portions of Chapters 1 through 11 of the textbooks will be covered this semester, as indicated in the reading assignments for each lecture (see *Course Schedule*). This curriculum features a unified approach that combines traditional mechanics and a modern view of quantized atomic levels. Applications will include topics involving asteroids, black holes, nuclear fission and fusion, quantization in atoms and molecules, and heat capacity. As a result of completing this course, you will come to understand and be able to describe a wide range of physical phenomena using only a few fundamental principles of physics.

COURSE COMPONENTS

The course will have the following components. Materials for each component will be provided online via *Brightspace*.

LECTURES: There will be two lectures each week for a total of 28 Lectures in the semester (see *Course Schedule*).

- Each lecture on Tuesday and Thursday is delivered at different times to different sections in PHYS 114. Since most of the lectures are nearly full capacity, we prefer that you attend the section assigned to you by the Registrar.
- BEFORE each Lecture, you MUST go through the short (~20 minute) PRE-LECTURE posted online on Brightspace in the LECTURES folder for each week. Doing so will enable you to get the most out of the LECTURES.
- If you are unable to attend your assigned lecture section on a given lecture day, you may attend an alternative lecture section that day and participate in the Clicker Questions to receive points.
- You should read the assigned sections of the text (see *Course Schedule*) prior to each lecture and use the lecture session to clarify and reinforce the ideas covered in the assigned readings.
- To assist you in reviewing lectures for study purposes, Boiler Cast videos will be made available for the weekly lectures. If you only rely on Boiler Cast videos, you will miss out on Clicker Question points and will not be able to see any problem solving completed on the overhead or demonstrations in the lecture room.
- Thus, lecture attendance is VERY STRONGLY recommended to understand the material. A video of Lecture 00 on *Brightspace* is a review of the mathematical concepts necessary for this course.

CLICKER QUESTIONS: Clicker questions in lecture are designed to provide feedback to the instructor and to you regarding your understanding of the lecture material.

- Clicker questions will count towards your final grade. You may attend any PHYS 172 lecture section, including one that you are not enrolled in, and your Clicker points will count.
- Clicker question points are NOT based on correctness of responses unless otherwise specified. For each lecture, you get 2.5 points if you answer any questions regardless of the answer.
- You may use only your own iClicker account during a lecture. Using more than one account will count as cheating, and you will face all the consequences of violating the Academic Honesty policy. Similarly, you are NOT allowed to share your Clicker account with anyone else in this class, even if they attend a different Lecture section.
- You are required to register your iClicker Cloud account before LECTURE 04 in the course. **If you fail to Register on iClicker Cloud you will NOT get points for participation.**
- Starting with Lecture 01, we will sync the iClicker points after each Lecture and they will appear in Brightspace. Please refer only to the iClicker points that appear in Brightspace and not those that may appear on your iClicker Cloud App. You have until Lecture 11 to inform us of any issues with your iClicker grades in Brightspace that must be addressed. **After Lecture 11, the iClicker points will stand as synced and will NOT be altered.**
- There are a total of 28 lectures during the semester. We understand that many students may be enrolling into class during the first week of class or unable to attend for various reasons during the first week. Therefore, clicker points will not count during the first three Lectures. This means there are a total of 25 lectures that will be counted towards clicker points in the semester starting with Lecture 04. Students are allowed 5 EXEMPTIONS in this category. **These EXEMPTIONS will cover those occasions on which you miss a LECTURE due to a brief illness, COVID-19/Quarantine, field trip, club sport event, internship, job fair, etc. For any unused exemptions at the end of the semester, lowest score items will be exempt to reach the 5 allowed. 20 lectures will make up the points in this category.**
- **There will NO MAKE-UP for any of the LECTURES.** If you miss a Lecture for any reason, you are first required to use the allowed EXEMPTION limit for any absence.

HOMEWORK: Two homework assignments will be due each week (Wednesday/Friday) **unless otherwise specified** and are generally due at 11:59PM on the due date (See *Course Schedule*).

- You will access and submit your homework online using a system called *Wiley Plus* within *Brightspace*. The system contains a compendium of problems that we will use for our course. You will have to purchase access to the system. You can access this through *Brightspace*.
- If you do not complete a homework assignment by the due date/time, you automatically get a 3-day extension. But you can only earn up to a maximum of 75% of the points on the late problems.
- We strongly recommend you complete all homework problems, even if late, to help prepare for the exams.
- You will have 10 attempts per question for each assignment.
- **DEADLINE & LATE POLICY FOR HOMEWORK: Deadline: 11:59 PM on date posted in Course Schedule If you complete the Homework within 72 hours of the due time you will receive 75% of the points you earn. After that you will receive 0 points.**
- There are a total of 25 Homework in the semester. At the end of the semester. Students are allowed 5 EXEMPTIONS in this category. **These EXEMPTIONS will cover those occasions on which you miss a HOMEWORK due to technical issue, a brief illness, COVID-19/Quarantine, field trip, club sport event, internship, job fair, etc. If at the end of the semester, there are unused exemptions, the lowest score items will be exempt to reach the limit of five allows. 20 homework scores will make up the points in this category.**
- **There will NO EXTENSIONS for any of the HOMEWORK.** If you are unable to complete the HOMEWORK for any reason, you may do so for 75% credit until 72 hours after the deadline.

RECITATION: Weekly Recitation sessions meet for 1 hour (50 minutes) most weeks (see *Course Schedule*).

- There **WILL BE a RECITATION meeting in WEEK 01**. Please be **sure to attend the REC section for which you are registered**. You will need to attend YOUR assigned REC section to receive points for REC 01.
- The Recitation worksheet will be posted in the appropriate week's folder within *Brightspace*. You are encouraged to look over the problems ahead of time so that you come to class ready to work and ask questions. Solutions to recitation problems will be posted in the folder at the end of the week (12:01 AM Sunday). **Please download and go through the Recitation Worksheet posted in Brightspace in the COURSE CONTENT > MODULE > WEEK > RECITATION folder, BEFORE your assigned RECITATION section time.**
- Starting **Week 01**, you are **REQUIRED** to attend **YOUR ASSIGNED** (by the Registrar) **Recitation** section. Please **BRING A LAPTOP OR TABLET TO EACH REC MEETING THAT IS FULLY CHARGED**. You will need this to complete the Recitation before you leave. You will get 0 points for the RECITATION if you are more than 15 minutes late to your REC session. Your **signature** on the **SIGN-UP SHEET** for **EACH REC** session is the **ONLY EVIDENCE** of your attendance.
- You will work in groups of **up to four** people. You are free to form a group with anyone in your Recitation section, but you must remain in that group for the entire semester. At your first Recitation meeting (Week 02), your TA will instruct you how to sign up for your group. The Recitation group will be different from the group you form in your Lab section.
- Each member in the group must complete and turn-in the recitation problem-solving activities and upload as single PDF of their work to Brightspace in the appropriate assignment upload link. You are NOT allowed to upload your REC if you have not physically attended your REC section. **If you upload your REC file without attending your REC section, that could be considered violation of the Academic Honesty policy and will result in appropriate actions.**
- Your recitation instructor will randomly select a group member's work from each group to grade, and the grade will apply to everyone in the group. When you upload your Recitation Worksheet you should receive a submission receipt from *Brightspace* confirming that the file uploaded properly. If you do not get such a confirmation, it means that the upload was not completed, and you must try again. Please preserve the submission confirmation you receive from Brightspace.
- **DEADLINE & LATE POLICY FOR RECITATION: Deadline: 11:59 AM on SATURDAY of the week of the Recitation. **Please follow directions in Brightspace on the FORMAT of the file(s) that must be uploaded, if not you will get ZERO points.****
Late Policy: Lose 10 points if 0-6 hours late. Lose 15 points if 6-12 hours late. Lose ALL points (get a 0 on the RECITATION) if 12 or more hours late.
- Rubrics for grading Recitation are provided in *Brightspace* and can be accessed at the link where you upload your Recitation for each week.
- There are **14 RECITATIONS in the semester**. Students are allowed 2 EXEMPTIONS in this category. **These EXEMPTIONS will cover occasions for which you miss a RECITATION due to a brief illness, COVID-19/Quarantine, field trip, club sport event, internship, job fair, etc. If at the end of the semester, there are unused exemptions,**

lowest score items will be exempt to reach the limit of 2 in the category. 12 recitation scores will make up the points in this category.

- There will **NO MAKE UP** for any of the **RECITATIONS**. Completing the RECITATION at home without attending YOUR Recitation section is **STRICTLY PROHIBITED**. and if you do so it will be considered a violation of the Academic Dishonesty policy.

LAB: Weekly laboratory sessions meet for two hours (110 minutes) on most weeks (see *Course Schedule*)

- In the first week, you will complete your Lab 01 at home and upload it on *Brightspace* as per the deadline posted in the *Course Schedule*. There will be **NO LAB MEETING** in **WEEK 01**.
- The Lab worksheet will be posted in the appropriate week's folder within *Brightspace*. You are encouraged to look over the lab ahead of time so that you come to your lab section ready to work and ask questions. **Please download and go through the Lab Worksheet posted in *Brightspace* in the COURSE CONTENT > MODULE > WEEK > LAB folder, BEFORE your assigned LAB section time.**
- Starting **WEEK 02**, you are **REQUIRED** to attend **YOUR ASSIGNED** (by the Registrar) **LAB** section. Please **BRING A LAPTOP OR TABLET TO EACH LAB MEETING THAT IS ADEQUATELY CHARGED**. You will need this to complete the Lab before you leave. You will get 0 points for the LAB if you are more than 15 minutes late to you LAB session. Your **signature** on the **SIGN-UP SHEET** for **EACH LAB** session is the **ONLY EVIDENCE** of your attendance.
- You will work in groups of **up to three** people. You are free to form a group with anyone in your lab section, but you must remain in that group for the entire semester. At your first Lab meeting (Week 02), your TA will instruct you how to sign up for your group. The lab group will be different from the group you form in the Recitation section.
- Each member of the group must complete the Lab write up and upload their work to *Brightspace* as a single PDF in the appropriate assignment upload link. You are NOT allowed to upload your LAB if you have not physically attended your LAB section. **If you upload your LAB file without attending your LAB section, that could be considered violation of the Academic Honesty policy and will result in appropriate actions.**
- Your Lab instructor will randomly select a group member's work from each group to grade, and that grade will apply to everyone in the group. When you upload your Lab Worksheet you should receive a submission receipt from *Brightspace* confirming that the file uploaded properly. If you do not get such a confirmation, it means that the upload was not complete, and you have to try again. Please preserve the submission confirmation you receive from *Brightspace*.
- **DEADLINE & LATE POLICY FOR LAB: Deadline: 11:59 PM on SATURDAY** of the week of the Lab. **Please follow directions in *Brightspace* on the FORMAT of the file(s) that must be uploaded, if not you will get ZERO points.** **Late Policy:** Lose 10 points if 0-12 hours late. Lose 20 points if 12-24 hours late. Lose ALL points (get a 0 on the LAB) if more than 24 hours late.
- Rubrics for grading Laboratory are provided in *Brightspace* and can be accessed at the link where you upload your Recitation for each week.
- There are **14 LABS in the semester**. Students are allowed 2 EXEMPTIONS in this category. These EXEMPTIONS **will cover occasions for which you miss a LAB due to a brief illness, COVID-19/Quarantine, field trip, club sport event, internship, job fair, etc. If at the end of the semester you have unused exemptions, lowest score items will be exempt to reach the limit of 2 in this category. 12 labs will make up the scoring for this category.**
- There will **NO MAKE UP** for any of the **LABS**. Completing the LAB at home without attending YOUR Lab section is **STRICTLY PROHIBITED**, and if you do so it will be considered a violation of the Academic Dishonesty policy.

COMPUTATIONAL PHYSICS ESSAY (CPE): Starting in the last third of the semester, you will spend part of your time during each Lab to work with your group to compose an artifact that we call a computational physics essay (CPE).

- *What is a Computational Physics Essay?* Computational essays consist of two parts: computation and essay. An essay is a relatively short piece of writing focused on a specific topic (usually in philosophy, science, and history). The word "essay" also means an attempt, to try. To essay, then, is to write in an attempt to explore a topic, answer a question, or solve a problem. Computation is the process of calculating things (usually mathematical functions). Today, computers primarily do it. So, a computational physics essay is a piece of technical writing which incorporates physics concepts and calculations in the form of computer code along with the traditional writing.
- *Why are we doing this?* The goal of the endeavor is for you and your group to first pose and later solve a complex problem that may be socially and/or personally relevant, as well as intellectually interesting and challenging. The problem that you pose and the solution that you create is one that demands you and your group be collaborative,

creative, and consolidate what you have learned through the labs, recitation, homework and lectures, both in terms of your knowledge of physics as well as your experimental, computational, and mathematical skills.

- *When will you tell us what to do?* In the middle of the semester, we will provide you with multiple examples of such an essay to show you what the final product of your endeavor might look like, as well as a detailed rubric showing the criteria on which your essay will be graded. You will have to plan your work and execute your plan each week.
- *When do we work on this?* Starting in the middle of the semester, in each lab, you will be asked to provide an update of what you and your group have accomplished thus far on the CPE. During your assigned LAB section time, in the Week indicated in the schedule, you will meet with your group to finalize your Computational Physics Essay. Your Final CPE (one per group) will be due as per the *Course Schedule* and is worth 60 points.
- **DEADLINE & LATE POLICY FOR ESSAY: Deadline: 11:59 PM on Due Date (See Course Schedule). Please follow directions in Brightspace on the FORMAT of the file(s) that must be uploaded, if not you will get ZERO points. Late Policy: Lose 15 points if 0-24 hours late. Lose 30 points if 24-48 hours late. Lose 45 points if 48-72 hours late. Lose ALL points (get a 0 on the Essay) if more than 72 hours late.**
- **There will NO MAKE UP for the CPE.** Completing the CPE at home without attending YOUR Lab section is STRICTLY PROHIBITED and if you do so it will be considered a violation of the Academic Dishonesty policy. If you miss the Lab in the week when you are supposed to work on your CPE (as per the *Course Schedule*) before final submission, **and have a valid reason for an absence**, you may request an exemption. Such exemptions, which will be very rare, will ONLY be made if you follow the procedure outlined in the [EXCUSED ABSENCE/ EXEMPTION/ EXTENSION](#) section in the Syllabus.

PROBLEM QUIZZES: Problem Quizzes are **completed online within a 12-HOUR WINDOW**. After you start, you will have **40 minutes** to complete each Quiz. Each Quiz has **no more than 6 questions**.

- The scheduled times for these quizzes can be found in the *Course Schedule*. The purpose of these Problem Quizzes is to serve as feedback to the instructor and yourself as you move forward in the course and prepare for the exams. Specifically, these Problem Quizzes are to serve as a reflective assessment on how well you understand the current topics and problem-solving that you will need to have mastered for each of the exams.
- See *Course Schedule* for the week in which these Problem Quizzes will occur. Each Quiz will be based on LECTURES, HOMEWORK and RECITATION from material posted on Brightspace under Content > PROBLEM QUIZZES
- You will need access to a computer, laptop, or mobile device with reliable internet access to take the Problem Quiz. Do NOT attempt to take it on your cell phone as it will not display correctly.
- You may only take the Problem Quiz once within the 12-hour window. If you fail to complete the problem quiz, you will receive ZERO points for that quiz.
- In the spirit of learning and practicing for the exams, you may utilize your notes, textbook, calculator, and any other non-human assistance during the quiz. **You may NOT interact with anyone** (i.e., students, TAs, anyone else) **either face-to-face or via any other medium** (i.e., email, text, phone, social media etc.), **or access ChatGPT, Chegg, or any other solutions website during the Problem Quiz.** IF you do ANY of these, it will count as Academic Dishonesty, and you will face all consequences of violating Purdue's Academic Honesty policy.
- There are **12 PROBLEM QUIZZES in the semester**. Students are allowed 3 EXEMPTIONS in this category. **These EXEMPTIONS will cover occasions for which you miss a PROBLEM QUIZ due to a brief illness, COVID-19/Quarantine, field trip, club sport event, internship, job fair, etc. If at the end of the semester you have unused exemptions, lowest score items will be exempt to reach the limit of three (3) in this category. Nine (9) Problem Quizzes make up the points in this category.**
- **There will NO MAKE-UP for any of the PROBLEM QUIZZES.** Please use your allowed exemptions for any absence.

MID-TERM EXAMS: There are **TWO (2) MID-TERM EXAMS**. The dates, times, and locations of each exam are in the **EXAM DATES** section of this *Syllabus*. Please follow instructions on *Brightspace* one week prior to each Exam.

- Each of the Mid-Term Exams will have up to **15 multiple-choice questions**, with a **duration of 60 minutes**. You are **NOT allowed** to use notes, textbooks, the internet, or discuss with anyone (in any way) during the exams.
- A **PRACTICE EXAM** will be posted in *Brightspace* at least one week prior to each exam. Solutions will be provided at least four days prior to the exam along with tips for tweaking the practice exam problems. Please follow the directions in *Brightspace* to use these to study for the real exam.
- Only ***Non-Graphing Calculators*** may be used during exams. **IF DURING THE EXAM YOU ARE FOUND WITH A GRAPHING CALCULATOR, YOU WILL GET ZERO POINTS ON THAT EXAM.**

- **If you fail to provide correct, complete, readable information, EXACTLY AS PER THE INSTRUCTIONS PROVIDED ON YOUR EXAM, YOU WILL LOSE AT LEAST 10 POINTS FOR EVERY MISTAKE.**
- There will **NO MAKE-UP** for any of the MID-TERM EXAMS unless pre-approved excuse arrangements have been made with the Course Coordinator. Such arrangements will **ONLY** be made if you follow the procedure outlined in the **EXCUSED ABSENCE/ EXEMPTION/ EXTENSION** section in the Syllabus.

FINAL EXAM: Completion of the **comprehensive FINAL EXAM** is a requirement for passing the course. The Final Exam will have up to **30 multiple-choice questions**, with a **duration of 120 minutes**. You are **NOT** allowed to use notes, textbooks, the internet, or discuss with anyone (in any way) during the exams. The date and time will be announced later in the semester. Do not make plans to leave campus before then.

- **Only Non-Graphing Calculators** may be used on the Final Exams. **IF DURING THE FINAL YOU ARE FOUND WITH A GRAPHING CALCULATOR, YOU WILL GET ZERO POINTS ON THE FINAL.**
- **If you fail to provide correct, complete, readable, EXACTLY AS PER THE INSTRUCTIONS PROVIDED ON YOUR FINAL, YOU WILL LOSE AT LEAST 10 POINTS FOR EVERY MISTAKE.**
- Information about how the Final Exam will be administered will be provided on *Brightspace*.

COURSE COMPONENT WEIGHTAGE

COURSE COMPONENT	TOTAL POINTS	% OF GRADE
LECTURES: 20 (LEC 04-28: 5 exemptions of 25 LECs)	50 pts (2.5 pts x 20 LECTs)	2.5%
HOMEWORKS (Wiley): 20 (5 exemptions out of 25 HWs)	240 pts (12 pts x 20 HWs)	12.0%
RECITATIONS: 12 (2 exemptions out of 14 RECs)	300 pts (25 pts x 12 RECs)	15.0%
LABS: 12 (2 exemptions out of 14 LABs)	360 pts (30 pts x 12 LABs)	18.0%
COMPUTATIONAL PHYSICS ESSAY: 1 (Complete during LAB)	60 pts	3.0%
PROBLEM QUIZZES: 9 (3 exemptions out of 12 QUIZZES)	450 pts (50 pts x 9 QUIZs)	22.5%
MID-TERM EXAMS: 2 (Two)*: 180 points each	360 pts	18.0%
FINAL EXAM: 1 (One)*: 360 points	360 pts	18.0%
TOTAL FOR COURSE	2000 points	100%

*EXAM POINTS Calculation: **HIGHEST** of THESE TWO NUMBERS will be **27.0%** of your Course Grade:

- Highest Mid-Term Exam Score (out of 180 pts.) + Full Final Exam Score (out of 360 pts)
- OR**
- Both Mid-Term Exam Scores (out of 360 pts.) + One-Half of Final Exam Score (out of 180 pts)

COURSE GRADE

Course grades will be assigned based on the total points (out of 2000) earned in the course. The cut off total points earned for each grade will be **no higher than** the ones listed in the list below:

TOTAL POINTS OUT OF 2000 (%) EARNED IN COURSE	COURSE GRADE
1940 (97%) or Above	A+
1860 (93%) – 1939	A
1800 (90%) – 1859	A-
1740 (87%) – 1799	B+
1660 (83%) – 1739	B
1600 (80%) – 1659	B-
1500 (75%) – 1599	C+
1400 (70%) – 1499	C
1300 (65%) – 1399	C-
1200 (60%) – 1299	D+
1100 (55%) – 1199	D
1000 (50%) – 1099	D-
999 or Below	F

It is your responsibility to ensure that the grades are accurate, and report this **at least 1 WEEK PRIOR** to when the **Course Grades are due** (see *Course Schedule* at end of this document).

HOW TO ESTIMATE YOUR STANDING IN THE COURSE?

A few days after the EXAM 2 scores are posted we will post a column in *Brightspace* Grades titled “**NON-EXAM PROGRESS**”. This will be a percentage, calculated using the current scores of Lectures, Labs, Recitations, and Homework. Then you can use this percentage as shown in the Example below to work out your estimated course grade. An email will be sent out to the class when this column is posted in *Brightspace*, including information on how it is calculated.

Please note that **this is just an estimate** based on the assumption that your performance on all assignments and assessments in the course that have yet to be completed will be the same as that on the corresponding previous assignment or assessment of the same component i.e. you will score the same on future HWs as you did on past HWs, you will score the same on future LABs as you did on past LABs, and so on. **The course coordinators, instructors or GTAs are NOT responsible for any incorrect assumptions or calculations that you might make about your estimated grade.**

We know from experience, the average for **NON-EXAM%** for the class is about **90%**. If you complete the Lectures, Homework, Recitation, Laboratory, and Problem Quizzes, you should be at the 90% level.

The **EXAMS (Mid-Terms + Final)** comprise the remaining 540 pts (27%) of your course grade.

Example: If your **NON-EXAM%** is 85% and your average on the **EXAMS%** is 70%, then a **quick conservative estimate** of your total points in this class is $(85\% \text{ of } 1460) + (70\% \text{ of } 540) = 1619$ points out of 2000. Based on the above table, your **estimated** final course grade would be a B-. Again, this is ONLY an estimate.

INCOMPLETE

A grade of incomplete (I) will be given only in unusual circumstances. To receive an “I” grade, a written request must be submitted to the Course Coordinator by the last date of classes. The request must describe the circumstances, along with a proposed timeline for completing the course work. Submitting a request does not ensure that an “I” grade will be granted. If granted, you will be required to fill out and sign an “Incomplete Contract” form that will be turned in with the course grades. Any requests made after the course is completed will not be considered for an incomplete grade.

TEACHING PHILOSOPHY

As instructors, it is our responsibility to maximize opportunities for every student in the class to learn, grow, and succeed in reaching both my own outcomes for the course and their personal goals and desires related to the class. To meet this responsibility, we draw on pedagogical theory, frameworks, and practices rooted in principles of collaborative learning and student-faculty partnership. For some students, this may feel awkward. Much of our society’s discussions about teaching focus on a banking system, in which an instructor deposits knowledge into a student’s mind, and students receive, file, store, and ultimately return that information in the same format in which it was deposited. Instead, we focus on student learning, which we define as a process of individual change. This means developing skills to view the world in new ways, and engaging in problem solving, critical thinking, as well as different types of debates, discussions, and dialogues.

GETTING HELP

This course will require a significant amount of time and effort. When a topic is not understood, or if you are stuck on a particular problem, try some of the following options:

- A) **HELP CENTER** is staffed by Graduate Teaching Assistants who are trained in this material. *The schedule for the Help Center Hours will be posted on Brightspace.* The location is **Room 290 PHYS**. Upon entering the Help Center, you will swipe your PUID in the card reader at the dedicated computer station near the HC entrance. Additional Help Center hours during exam weeks will be posted here: http://www.physics.purdue.edu/academic-programs/courses/help_center.html
- B) Make arrangements to meet with either of the following instructors: Course Coordinators, Lecture Instructor, Recitation TA, or Lab TA. See any of these during office hours or make an appointment. We are happy to work to improve your understanding of the course content.
- C) Supplemental Instruction (SI) study sessions are available for this course. These study groups are open to anyone enrolled in this course who would like to stay current with the course material and understand the material better. Attendance at these sessions is voluntary but extremely beneficial for those who attend weekly. Times and locations for the help sessions can be found here: <http://www.purdue.edu/si> or the free app: www.purdue.edu/boilerguide . Students who attend these interactive sessions will find themselves working with peers as they compare notes, demonstrate and discuss pertinent problems and concepts, and share study and test-taking strategies. Students are

asked to arrive with their student ID card, lecture notes and questions to these informal, peer-led study sessions. Your SI Leaders will be announced shortly.

ATTENDANCE POLICY

This course follows Purdue's academic regulations regarding attendance, which states that students are expected to be present for every meeting of the classes in which they are enrolled. Attendance will be taken in each class and lateness will be noted. When conflicts or absences can be anticipated, such as for many University-sponsored activities and religious observations, **please first use your allowed exemptions in each assignment category**. After the allowed exemptions are exhausted, please follow instructions in the EXCUSED ABSENCES/EXEMPTIONS/EXTENSIONS section in the Course Syllabus. For unanticipated or emergency absences and after the allowed exemptions in each category are exhausted, please follow instructions in the EXCUSED ABSENCES/EXEMPTIONS/EXTENSIONS section in the Course Syllabus. As per these instructions, the student or the student's representative should contact or go to the [Office of the Dean of Students \(ODOS\) website](#) to complete appropriate forms for instructor notification. Under academic regulations, excused absences may be granted **by ODOS** for cases of grief/bereavement, military service, jury duty, parenting leave, or emergent or urgent care medical care. These reasons must be reported to the ODOS office first, and they will notify instructors accordingly. If you have an extended absence for any reason, please reach out to the Course Coordinator via Purdue email so that we can communicate about how you can maintain your academic progress. If you find yourself too sick to progress in the course, please notify your adviser and the Course Coordinator via email.

EXCUSED ABSENCES / EXEMPTIONS / EXTENSIONS

This course is designed with a generous number of EXEMPTIONS to allow for most every life occurrence that Purdue students face. Those exemptions are to be used first, and in almost every case, they exceed the number students have ever needed, but they are there to help ease your mind when issues arise and reduce the communication required back and forth to warrant excuses absences. As adults, you must be responsible for your attendance and by building in these exemptions, you are being empowered to be successful in this course, while still having those moments in life not entirely in your control. Please use this power wisely.

- **CLICKER LECTURE SESSIONS:** Starting LECTURE 04, you are allowed 5 EXEMPTIONS for any reason at all, no explanation necessary.
- **HOMEWORK:** You are allowed 5 EXEMPTIONS for any reason at all, no explanation necessary.
- **RECITATIONS:** You are allowed 2 EXEMPTIONS for any reason at all, no explanation necessary.
- **LABS:** You are allowed 2 EXEMPTIONS for any reason at all, no explanation necessary.
- **PROBLEM QUIZZES:** You are allowed 2 EXEMPTIONS for any reason at all, no explanation necessary.
- **MID-TERM EXAMS: Extensions (i.e., Make-Up Exam) for Mid-Term Exam are given in VERY RARE circumstances.** Such requests will be highly scrutinized and will REQUIRE a **Letter from the Office of Dean of Students** along with SUPPORTING DOCUMENTED EVIDENCE. If you can provide these materials, but are **unable to complete the Make-Up Exam within one week of the scheduled exam** then you will receive a score for your missed Mid-Term Exam, based on the following formula:

$$\text{Score on Missed Exam} = \text{Class Average on Missed Exam} + (\text{Your Average on Other Exam} - \text{Class Average on Other Exam})$$

Please note that this process can only be used if you miss **AT MOST ONE** Mid-Term Exam. If you miss more than one Mid-Term Exam, and you have a valid reason as evidenced by SUPPORTING DOCUMENTED EVIDENCE, then you will receive a grade of INCOMPLETE in the course and you will have to plan with the Course Coordinator to take all of the missed Mid-Term Exams at a later date.

- **FINAL EXAM:** If you have a valid reason (based on criteria for the Mid-Term Exams above) and evidenced by SUPPORTING DOCUMENTED EVIDENCE, that prevents you from taking the Final Examination, you will receive a grade of Incomplete for the course and you will have to plan with the Course Coordinators to take the Final Exam at a later date. **The FINAL EXAM cannot be exempted under ANY CIRCUMSTANCES.**

SUPPORTING DOCUMENTED EVIDENCE: You should provide at least ONE of the pieces of evidence below as Supporting Documentation. This documentation needs to be provided to the **Office of Dean of Students (ODOS)** NOT the instructor:

- In case of required attendance at an official Purdue sponsored event or activity as listed above, you need a letter from the appropriate Purdue organizational unit to indicate that specifies that you are required to be present for a

specific official Purdue sponsored event or activity. Please attach a PDF of this letter as Supporting Documented Evidence to your Request for Excused Absences/Extensions.

- In case of an extended absence, you must contact the **Office of Dean of Students (ODOS)**; and request them to send the Course Instructors a Letter of Approved Absence. If ODOS agrees to provide a letter to your Course Instructors, they will NOT provide you with the Letter that they send to Course Instructors. However, **ODOS will send you an email informing you that such a letter has been sent to your Course Instructors.** Please attach a PDF of this email as Supporting Documented Evidence to your Request for Excused Absences/Extensions.
- In case of illness, go to the Purdue University Student Health Center (PUSH). You should receive a slip from the Center with the date, doctor's name, and a telephone number OR go to your private physician and obtain a written excuse. Provide that information to the ODOS, and they will contact instructors accordingly. If ODOS agrees to provide a letter to your Course Instructors, they will NOT provide you with the Letter that they send to Course Instructors. However, **ODOS will send you an email informing you that such a letter has been sent to your Course Instructors.** Please attach a PDF of this email as Supporting Documented Evidence to your Request for Excused Absences/Extensions.
- In case of accidents, funerals, etc., please provide a police accident report, funeral notice etc. Provide this information to the ODOS, they will communicate with the instructors as needed. If ODOS agrees to provide a letter to your Course Instructors, they will NOT provide you with the Letter that they send to Course Instructors. However, **ODOS will send you an email informing you that such a letter has been sent to your Course Instructors.** Please attach a PDF of this email as Supporting Documented Evidence to your Request for Excused Absences/Extensions.

FOLLOW THE PROCEDURE BELOW IF YOU ARE REQUESTING AN EXEMPTION / EXTENSION ON A LECTURE, HOMEWORK, LAB, RECITATION, PROBLEM QUIZ, MID-TERM EXAM:

- Prepare a **COVER LETTER** clearly stating the following information (**Please download at template for this letter posted in Brightspace in the CONTENT (top menu) > COURSE INFO (side bar) > REQUESTING AN EXCUSED ABSENCE.** The following information is required in the COVER LETTER.
 - LAST NAME, First Name
 - PURDUE EMAIL
 - REASON FOR EXCUSED ABSENCE REQUEST: Briefly state **WHY** you are requesting an excused absence (Attach **SUPPORTING DOCUMENTED EVIDENCE** above)
 - DATES OF ABSENCE
 - LIST OF ASSIGNMENTS for which an excused absence is requested. **NOTE:** You must state the exact # of the Lab, Recitation, HW etc. that you miss, e.g., LAB 04, REC 05 etc. It is not adequate to simply provide the date or week in which you missed the assignments.
 - LAB SECTION & LAB GTA (if an excused LAB absence is requested)
 - RECITATION SECTION & REC GTA (if an excused RECITATION absence is requested).
- Attach to the letter the **SUPPORTING DOCUMENTED EVIDENCE.**
- **VERY IMPORTANT: COMBINE the COVER LETTER with the SUPPORTING DOCUMENTED EVIDENCE into a SINGLE PDF FILE.**
- **UPLOAD this SINGLE PDF FILE using the link in the Brightspace in the CONTENT (top menu) > COURSE INFO. (side bar) > REQUESTING AN EXCUSED ABSENCE. **PLEASE NOTE: DO NOT SEND THIS LETTER AS AN EMAIL ATTACHMENT. WE CANNOT ACCEPT SUCH LETTERS VIA EMAIL.****

ACCOMMODATIONS

If you receive notification from the Dean of Students that you are entitled to accommodation, supported by a DRC Letter, please inform your Course Coordinators. They will then confirm that they have received notification from DRC regarding your accommodation. Refer to information in Brightspace regarding Accommodated Testing. Please note: All students, DRC or not, have a responsibility to meet deadlines for the exam. Any inaction or delay by students that impacts your ability to take the exam with or without accommodations may result in a zero for that exam. So PLEASE be very aware of the exam dates and schedule your testing sessions well in advance to protect yourself from not being able to get a seat at the Purdue Testing Center (PTS). The DRC, PTS and Course Personnel will meet their obligations to have your exam ready for you at the time of your session.

CLASSROOM GUIDANCE REGARDING PROTECT PURDUE

Any student who has substantial reason to believe that another person is threatening the safety of others by not complying with Protect Purdue protocols is encouraged to report the behavior to and discuss the next steps with their

instructor. Students also have the option of reporting the behavior to the [Office of the Student Rights and Responsibilities](#). See also [Purdue University Bill of Student Rights](#) and the Violent Behavior Policy under University Resources in *Brightspace*.

ACADEMIC INTEGRITY

Purdue's Honor Pledge: "As a Boilermaker pursuing academic excellence, I pledge to be honest and true in all that I do. Accountable together - we are Purdue."

Any effort to represent somebody else's work as your own, or allowing your work to represent somebody else's, is cheating. Working with another student on your Recitation, Lab, or Homework is NOT cheating and, in fact, is encouraged. However, having somebody else do your work IS cheating.

If a student is found cheating, they will receive an F for the course and be reported to the Dean of Students. In serious cases the Dean may suspend or expel the student from the University.

Academic integrity is one of the highest values that Purdue University holds. Individuals are encouraged to alert university officials to potential breaches of this value by either emailing integrity@purdue.edu or by calling 765-494-8778. While information may be submitted anonymously, the more information is submitted the greater the opportunity for the university to investigate the concern. Please see the course *Brightspace* page under University Policies.

NON DISCRIMINATION STATEMENT

Purdue University is committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her potential. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life. A hyperlink to Purdue's full Nondiscrimination Policy Statement is included in our course *Brightspace* under University Policies.

EXPECTATIONS REGARDING RESPECT FOR OTHERS

At Purdue, you will encounter many people who appear very different from you. Beyond superficial physical differences, members of our Purdue community may hold opinions with which you may disagree and may be very different from you among the infinite number of human dimensions. These physical, intellectual and cultural differences offer the opportunity to learn and enrich your experiences as a student and a human being. Our expectation of you as a member of Purdue and of the larger global community is that you will always show respect for others. Learning how to do so is but one component of your personal growth and one way in which you, together with the rest of our community, can create a more inclusionary environment. It is your obligation as an individual with the privilege to attend an institution of higher learning to engage with others in respectful ways.

Purdue University is committed to providing a safe and secure campus environment for members of the university community. Purdue strives to create an educational environment for students and a work environment for employees that promote educational and career goals. Violent Behavior impedes such goals. Therefore, Violent Behavior is prohibited in or on any University Facility or while participating in any university activity. See the Student Widget on our course *Brightspace* for more information on the Violent Behavior Policy.

MENTAL HEALTH/WELLNESS STATEMENT

If you find yourself beginning to feel some stress, anxiety and/or feeling slightly overwhelmed, try [WellTrack](#). Sign in and find information and tools at your fingertips, available to you at any time.

If you need support and information about options and resources, please contact or see the [Office of the Dean of Students](#). Call 765-494-1747. Hours of operation are M-F, 8 am- 5 pm.

If you find yourself struggling to find a healthy balance between academics, social life, stress, etc., sign up for free one-on-one virtual or in-person sessions with a [Purdue Wellness Coach at RecWell](#). Student coaches can help you navigate through barriers and challenges toward your goals throughout the semester. Sign up is free and can be done on BoilerConnect.

If you're struggling and need mental health services: Purdue University is committed to advancing the mental health and well-being of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of mental health support, services are available. For help, such individuals should contact [Counseling and Psychological Services \(CAPS\)](#) at 765-494-6995 during and after hours, on weekends and holidays, or by going to the CAPS office on the second floor of the Purdue University Student Health Center (PUSH) during business hours. The [CAPS website](#) also offers resources specific to situations such as COVID-19.

BASIC NEEDS SECURITY

Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact the Dean of Students for support. There is no appointment needed and Student Support Services is available to serve students 8 a.m.-5 p.m. Monday through Friday. Students may submit requests for emergency assistance from the [Critical Need Fund](#)

EMERGENCY PREPAREDNESS

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor's control. Relevant changes to this course will be posted onto the course website or can be obtained by contacting the instructors or TAs via email or phone. You are expected to read your @purdue.edu email on a frequent basis.

CHANGES TO COURSE DUE TO MAJOR CAMPUS EMERGENCY

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances. Course information will, in general, be disseminated via one or more of the following routes: lecture, recitations, labs, email, and *Brightspace*.

CONFLICTS

In case of examination conflicts (exams scheduled for the same student at the same time), similar to final examinations, students faced with a direct exam conflict are entitled to reschedule either examination. It is the responsibility of the student to make the request for the necessary arrangements at least one week before the scheduled exam.

Course instructors shall not penalize a student who chooses to reschedule an examination under these options. In the event the student is unable to reach an agreement with the course instructors to reschedule one of the exams, the student will contact the Office of the Registrar; the Registrar will make the final decision as to which exam is to be rescheduled and offered at an alternate time; the Registrar will communicate this decision to the course instructor and relevant Department Head.

In case of examination conflicts with a scheduled evening course, the conflict should be resolved by the instructors, provided that the student informs them of the conflict at least a week before the exam. If the instructors cannot resolve the conflict, the scheduled evening course takes priority. The examination instructor must offer an alternative time for their exam.

Other conflicts should be resolved between the instructor and the student. Reasons for conflict should be taken under careful and reasonable consideration by the instructor and student. If conflict resolution is not possible, the examination shall take precedence, subject to appeal through the head of the department in which the course is offered.

ACCESSIBILITY

Purdue University strives to make learning experiences as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, you are welcome to let me know so that we can discuss options. You are also encouraged to contact the Disability Resource Center at: drc@purdue.edu or by phone: 765-494-1247.

Students with disabilities must be registered with Disability Resource Center (DRC) (drc@purdue.edu) in the Office of the Dean of Students before classroom accommodations can be provided. If you are eligible for academic accommodation because you have a documented disability that will impact your work in this class, please schedule an appointment with me as soon as possible to discuss your needs.

Purdue University is committed to making learning experiences accessible. If you anticipate or experience physical or academic barriers based on disability, you are welcome to let me know so that we can discuss options. You are also encouraged to contact the Disability Resource Center at: drc@purdue.edu or by phone: 765-494-1247.

COURSE EVALUATION STATEMENT

During the last two weeks of the semester, you will be provided with an opportunity to give feedback on this course and your instructor. Purdue uses an online course evaluation system. You will receive an official email from evaluation administrators with a link to the online evaluation site. You will have up to 13 days to complete this evaluation. Your participation is an integral part of this course, and your feedback is vital to improving education at Purdue University. I strongly urge you to participate in the evaluation system.

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Online educational environments, like all learning environments, should provide opportunities for students to reflect, explore new ideas, post opinions openly, and have the freedom to change those opinions over time. Students enrolled in and instructors working in online courses are the authors of the works they create in the learning environment. As authors, they own the copyright in their works subject only to the university's right to use those works for educational purposes (Visit [Purdue University Copyright Office](#)). Students may not copy, reproduce, or post to any other outlet (e.g., YouTube, Facebook, or other open media sources or websites) any work in which they are not the sole or joint author or have not obtained the permission of the author(s).

CHANGES TO SYLLABUS AND SCHEDULE

The Course Coordinator reserves the right to make changes to this SYLLABUS and/or SCHEDULE for the course. Any changes will be posted on Brightspace, and you will receive an email informing you of the changes.

PURDUE UNIVERSITY – PHYS 172: MODERN MECHANICS

SPRING 2025 COURSE SCHEDULE

WEEK	READ SECTIONS IN TEXT	HOMEWORK (WileyPLUS) DUE @ 11:59pm	LECTURES (Weekly Lectures are Tues. & Thurs. in PHYS 114 unless specified otherwise)	LAB
1	REC 01: Position & Displacement Vectors – DUE 11:59 AM SATURDAY (01/18)			LAB 01: DUE 11:59 PM SATURDAY (01/18)
	Jan 13 – 17	1.1-1.5	NO HW	LEC 01. Matter & Interactions
1.5-1.11		HW 01 (Due 01/17, Fri.)	LEC 02. Momentum & Position Update	
2	REC 02: Iterative Prediction: Const. Force -- DUE 11:59 AM SATURDAY (01/25)			LAB 02: DUE 11:59 PM SATURDAY (01/25)
	Jan 20 -- 24	2.1-2.6	HW 02 (Due 01/22, Wed.)	LEC 03. The Momentum Principle
2.7-2.8 3.1-3.4		HW 03 (Due 01/24, Fri.)	LEC 04. Predicting Motion, Fundamental Interactions	
3	REC 03: Iterative Prediction: Non-Const. Net Force – DUE 11:59 AM SAT. (02/01)			LAB 03: DUE 11:59 PM SATURDAY (02/01)
	Jan 27 – 31	3.5-3.17	HW 04 (Due 01/29, Wed.)	LEC 05. Fundamental Interactions
4.1-4.8		HW 05 (Due 01/31, Fri.)	LEC 06. Model of Solids	
4	REC 04: Multiparticle Syst. & Contact Interaction – DUE 11:59 AM SAT. (02/08)			LAB 04: DUE 11:59 PM SATURDAY (02/08)
	Feb 03 – 07	4.9-4.15	HW 06 (Due 02/05, Wed.)	LEC 07. Sound & Pressure
5.1-5.6		HW 07 (Due 02/07, Fri.)	LEC 08. Rate of Change of Momentum – I	
5	REC 05: Forces from Motion & Motion from Forces– DUE 11:59 AM SAT. (02/15)			LAB 05: DUE 11:59 PM SATURDAY (02/15)
	Feb 10 - 14	5.1-5.6	HW 08 (Due 02/12, Wed.)	LEC 09. Rate of Change of Momentum – II
5.7-5.10		HW 09 (Due 02/14, Fri.) & HW 10 (Due 02/16, SUN.)	LEC 10. Circular Motion	
6	EXAM 1: 6:30 – 7:30 PM, MONDAY, 02/17. Location: ELLIOTT HALL Covers: LEC 01-10, HW 01-10, REC 01-05, LAB 01-05			

	WEEK	READ SECTIONS IN TEXT	HOMEWORK (WileyPLUS) DUE @ 11:59pm	LECTURES (Weekly Lectures are Tues. & Thurs. in PHYS 114 unless specified otherwise)	LAB
6	REC 06: Mom. Principle & Energy Principle I – DUE 11:59 AM SATURDAY (02/22)				LAB 06: DUE 11:59 PM SATURDAY (02/22)
	Feb 17 – 21	--	NO HW	NO LECTURE due to EXAM 1	
		6.1-6.4	NO HW	LEC 11. Work & Kinetic Energy	
7	REC 07: Energy Principle I: KE and Work – DUE 11:59 AM SATURDAY (03/01)				LAB 07: DUE 11:59 PM SATURDAY (03/01)
	Feb 24 – 28	6.5-6.8	HW 11 (Due 02/26, Wed.)	LEC 12. Rest Energy, Grav. Potential Energy	PROBLEM QUIZ 04 (40 min.) Online 9:01AM – 8:59PM, MONDAY, 02/24 Covers: LEC 09-11, HW 08-11, REC 05-06
		6.9-6.14	HW 12 (Due 02/28, Fri.)	LEC 13. Elect. Pot. Energy, Energy vs Separation	
8	REC 08: Ener. Prin. II – Electrical PE & Conservation – DUE 11:59 AM SAT. (03/08)				LAB 08: DUE 11:59 PM SATURDAY (03/08)
	Mar 03 – 07	7.1-7.8	HW 13 (Due 03/05, Wed.)	LEC 14. Energy of Neutral Atoms, Int. Energy, Power, Open & Closed Systems	PROBLEM QUIZ 05 (40 min.) Online 9:01AM – 8:59PM, MONDAY, 03/03 Covers: LEC 11-13, HW 11-13, REC 06-07
		7.10-7.12	HW 14 (Due 03/07, Fri.)	LEC 15. Energy Dissipation, Resonance	
9	REC 09: Ener. Princ. III – Spring PE & Conservation – DUE 11:59 AM SAT. (03/15)				LAB 09: DUE 11:59 PM SATURDAY (03/15)
	Mar 10 – 14	9.1-9.2	HW 15 (Due 03/12, Wed.)	LEC 16. Multiparticle System Energy, Rotational Energy	PROBLEM QUIZ 06 (40 min.) Online 9:01AM – 8:59PM, MONDAY, 03/10 Covers: LEC 13-15, HW 13-15, REC 07-08
		9.3	HW 16 (Due 03/14, Fri.)	LEC 17. Comparing Two Models of a System	
10	Mar 17 - 21	SPRING BREAK			PROBLEM QUIZ 07 (40 min.) Online 9:01AM – 8:59PM, FRIDAY, 03/14 Covers: LEC 15-16, HW 15-16, REC 08-09
11	REC. 10: Energy Prin. IV - Real & Point Particle Syst.– DUE 11:59 AM SAT. (03/29)				LAB 10: DUE 11:59 PM SATURDAY (03/29)
	Mar 24 – 28	10.1-10.11	HW 17 (Due 03/26, Wed.)	LEC 18. Collisions & Scattering (NOT on Exam 2)	PROBLEM QUIZ 08 (40 min.) Online 9:01AM – 8:59PM, TUESDAY, 03/25 Covers: LEC 15-17, HW 15-17, REC 08-09
		11.1-11.3	HW 18 (Due 03/28, Fri.)	LEC 19. Angular Momentum (NOT on Exam 2)	
12	EXAM 2: 6:30 – 7:30 PM, MONDAY, 03/31. Location: ELLIOTT HALL Covers: LEC 11-17, HW 11-18, REC 06-10, LAB 06-10				

	WEEK	READ SECTIONS IN TEXT	HOMEWORK (WileyPLUS) DUE @ 11:59pm	LECTURES (Weekly Lectures are Tues. & Thurs. in PHYS 114 unless specified otherwise)	LAB
12	REC 11: Elastic & Inelastic Collisions – DUE 11:59 AM SATURDAY (04/05)				LAB 11: DUE 11:59 PM SATURDAY (04/05)
	Mar 31 – Apr 04	--	NO HW	NO LECTURE due to EXAM 2	
		11.4-11.7	HW 19 (Due 04/04, Fri.)	LEC 20. Angular Mom. – Zero Torque	
13	REC 12: Torque & Angular Mom. – I – DUE 11:59 AM SATURDAY (04/12)				LAB 12: DUE 11:59 PM SATURDAY (04/12)
	Apr. 07 – 11	11.8-11.9	HW 20 (Due 04/09, Wed.)	LEC 21. Angular Mom. –Non-Zero Torque	PROBLEM QUIZ 09 (40 min.) Online 9:01AM – 8:59PM, MONDAY, 04/07 Covers: LEC 17-20, HW 17-20, REC 10-11
		11.8-11.9	HW 21 (Due 04/11, Fri.)	LEC 22. Angular Mom. II	
14	REC 13: Torque & Angular Mom. – II – DUE 11:59 AM SATURDAY (04/19)				LAB 13: DUE 11:59 PM SATURDAY (04/19)
	Apr. 14 – 18	11.8-11.9	HW 22 (Due 04/16, Wed.)	LEC 23. Angular Mom. III	PROBLEM QUIZ 10 (40 min.) Online 9:01AM – 8:59PM, MONDAY, 04/14 Covers: LEC 17-22, HW 17-22, REC 11-12
		11.1-11.9	HW 23 (Due 04/18, Fri.)	LEC 24. Angular Mom. IV	
15	REC 14: Applying All Three Principles – DUE 11:59 AM SATURDAY (04/26)				LAB 14: DUE 11:59 PM SATURDAY (04/26)
	COMPUTATIONAL PHYSICS ESSAY (Complete it in LABs 11-14): DUE 11:59 PM, SATURDAY (04/26)				
	Apr. 21 – 25	8.1-8.10	HW 24 (Due 04/23, Wed.)	LEC 25. Energy Quantization	PROBLEM QUIZ 11 (40 min.) Online 9:01AM – 8:59PM, MONDAY, 04/21 Covers: LEC 18-24, HW 17-24, REC 11-13
11.1-11.9		HW 25 (Due 04/25, Fri.)	LEC 26. Review Lecture: Angular Momentum		
16	NO RECITATION (Quiet Period)				NO LAB (Quiet Period)
	Apr. 28 – May 02	1.1-11.9	NO HW	LEC 27. Review Exam 1 Material: Video Recorded Lecture – Clicker Pts. Via Lecture Quiz Due 12:01 AM, 05/04.	
		1.1-11.9	NO HW	LEC 28. Review Exam 2 Material: Video Recorded Lecture – Clicker Pts. Via Lecture Quiz Due 12:01 AM, 05/04.	
17	FINAL EXAM: 08:00 – 10:00 AM, THURSDAY, MAY 08. Please DO NOT make plans to leave campus before the Final Exam				

GRADES DUE: 5:00 PM ET, TUESDAY, MAY 13.