FLORIDA POLYTECHNIC UNIVERSITY

General Education Syllabi -- Fall 2022

Courses

PHY 2048 - Physics 1

FLORIDA POLYTECHNIC UNIVERSITY

Syllabus: PHY 2048 – Physics 1

Fall Semester 2022

Course Information

- Course Number and Title: PHY 2048 – Physics 1
- Credit Hours: 3
- Current Academic Term: Fall 2022

Instructor Information

- Instructor: Emadelden Fouad, Nicoleta Hickman, Sesha Srinivasan
- Office: ARC 2274, ARC 2270, ARC 2271
- Office Hours: TBD
- Email of Instructor: efouad@floridapoly.edu; nhickman@floridapoly.edu; ssrinivasan@floridapoly.edu

Course Details

- Explanation of class delivery mode/meeting times expectations, noting specifically
  - Class delivery mode: In-Person and On Campus
  - Meeting times:

Section 1	TR	2PM	to	3:15PM
Section 2	MWF	2PM	to	2:50PM
Section 3	MWF	1PM	to	1:50PM
Section 4	TR	11AM	to	12:15PM
Section 5	TR	12:30PM	to	1:45PM
Section 6	TR	9:30AM	to	10:45AM

- Official Catalog Course Description: This is the first of a two-semester sequence of physics for science, technology and engineering students. The course covers Newtonian mechanics and includes motion, vectors, Newton's laws, work and conservation of energy, systems of particles, collisions, equilibrium, oscillations and waves.
  - Course Pre-Requisites: High-School Physics, PHY 2020 (or equivalent) and MAC2311– Analytic Geometry and Calculus I.
  - Course Co-Requisite or Pre-requisite: MAC 2312 – Analytic Geometry and Calculus 2
  - Course Co-Requisite: PHY 2048L – Physics 1 Laboratory
  - **Communication/Computation Skills Requirement (6A-10.030)**: N
  - Required Texts: Physics for Scientists and Engineers: A Strategic Approach by Randall D. Knight, 4th Edition, ISBN-13: **9780133942651** (purchase option from Pearson via Canvas LMS) and **9780136780632** (Purchase option from bookstore via Canvas LMS) **[Please purchase the Modified Mastering Physics Access Code via my Canvas Course, you are directed to purchase either from Pearson option or use access code purchased from FL Poly Bookstore]**
  - **Equipment and Materials**: Scientific calculator (graphing ability NOT necessary), University CANVAS LMS system & University e-mail system, Instructor Lectures, Videos, Notes and Handouts
- **Course Objectives**: Upon successful completion of this course, you should be able to:
  - **Define** motion, work, energy, power, momentum, equilibrium, and oscillations.
  - **Develop** skills for converting from one-unit system to other unit system.
  - **Demonstrate** the ability to derive units from known formulae.
  - **Solve** problems systematically using Physics laws and principles.
- **Course Learning Outcomes (CLO)**
  - **Demonstrate** mathematical skills required to manipulate and solve physics equations.
  - **Apply** physics concepts to solve problems based on real-world situations.
  - **Connect** figures, diagrams, graphs, and data to underlying physics concepts.
  - **Connect** physics concepts to each other and to the real-world
- **Metacognitive Learning Outcomes (MLO)**
  - **Decode** the fundamental laws, theories, and principles central to Physics by describing how an example or practice problem illustrates a specific law, theory or principle in concept checks and conceptual test problems.

- **Apply** correct formula and equation for obtained/provided solution in numerical practice problem set, and concept-based text questions to predict a system's initial and final conditions.
- **Compare and contrast** figures, diagrams, graphs, texts, data, scientific formula, and solution strategies with respect to underlying Physics concepts.
- **Evaluate** a multi-step description of a problem to determine assumptions inherent in the unknown and known parameters, choose the correct formula in a given set, and systemic solving of a problem with appropriate significance.
- **Infer** the functioning of the Physics laws and principles from agreement between measured macroscopic values and predicted values of idealized systems through the demonstrations, calculations, and conceptual exercises and through interpretation of numerical problems.
- **Construct** the right formula for a numerical problem by deriving it from the first principles, successfully **synthesize** the solution to the problem based on the derived formula and use in a systematic manner.

- **Alignment with Program Outcomes**:

SLO Table

Course Learning Outcome	Learning Level	Program Learning Outcome (ABET)
Demonstrate mathematical skills required to manipulate and solve physics equations.	**Remember** Recognize Recall	1
Apply physics concepts to solve problems based on real-world situations.	**Apply and Analyze** Execute Implement Differentiate Organize	1
Connect figures, diagrams, graphs, and data to underlying physics concepts.	**Understand** Interpret Compare Explain	3
Connect physics concepts to each other and to the real-world	**Evaluate** Check Critique	1, 4

Academic Support Resources

- **Library**: Students can access the Florida Polytechnic University Library through the University website and Canvas, on and off campus. Students may direct questions to Academic Success Center success@floridapoly.edu or by email, library@floridapoly.edu.
- **ASC**: The Academic Success Center, located in the IST and at ASC East, provides a range of services. Students may direct questions to success@floridapoly.edu.

Subject Learning Goals

CHAPTER 1: Concepts of Motion [Sections 1.1-1.8]

1. To understand and use the basic ideas of the *particle model*.
2. To analyze the motion of an object by using *motion diagrams* as a tool.
3. To differentiate between the concepts of position, velocity, and acceleration.
4. To recognize the relationship between *v* and *a* when an object is speeding up, slowing down, or at a turning point.
5. To gain initial experience with graphical addition and subtraction of vectors.
6. To begin the process of learning to analyze problem statements and to translate the information into other representations.
7. To learn about position-versus-time graphs and the sign conventions for one-dimensional motion.
8. To understand the proper use of significant figures.

CHAPTER 2: Kinematics in One Dimension [Sections 2.1-2.6]

1. To differentiate clearly between the concepts of position, velocity, and acceleration.
2. The interpret kinematic graphs.
3. To translate kinematic information between verbal, pictorial, graphical, and algebraic representations.
4. To learn the basic ideas of calculus (differentiation and integration) and to utilize these ideas both symbolically and graphically.
5. To understand free-fall motion.
6. To begin the development of a robust problem-solving strategy.
7. To solve quantitative kinematics problems and to interpret the results.

CHAPTER 3: Vectors and Coordinate Systems [Sections 3.1-3.4]

1. To understand the basic properties of vectors.
2. To add and subtract vectors both graphically and using components.
3. To be able to decompose a vector into its components and to reassemble vector components into a magnitude and a direction.
4. To recognize and use the basic unit vectors.
5. To work with tilted coordinate systems.

CHAPTER 4: Kinematics in Two Dimensions [Sections 4.1-4.6]

1. To identify the acceleration vector for curvilinear motion.
2. To compute two-dimensional trajectories.
3. To understand projectile motion.
4. To understand relative motion.
5. To understand the kinematics of uniform circular motion.
6. To understand angular acceleration and the kinematics of nonuniform circular motion.

CHAPTER 5: Force and Motion [Sections 5.1-5.7]

1. To recognize what does and does not constitute a force.
2. To identify the specific forces acting on an object.
3. To draw an accurate free-body diagram of an object.
4. To begin the process of understanding the connection between force and motion.
5. To begin learning how to explain an observation on the basis of physical principles.

CHAPTER 6: Dynamics I: Motion Along a Line [Sections 6.1-6.6]

1. To draw and make effective use of free-body diagrams.
2. To recognize and solve simple equilibrium problems.
3. To distinguish mass, weight, and gravity.
4. To learn and use simple models of friction and drag.
5. To apply the full strategy for force and motion problems to problems in single-particle dynamics.

CHAPTER 7: Newton's Third Law [7.1-7.5]

1. To learn how two objects, interact.
2. To identify action/reaction pairs of forces.
3. To understand and use Newton's third law.
4. To understand how to use propulsion forces and tension forces.

CHAPTER 8: Dynamics II: Motion in a Plane [Sections 8.1-8.5]

1. To compute two-dimensional trajectories.
2. To understand the dynamics of uniform circular motion.
3. To learn the basic ideas of orbital motion.
4. To answer, "How does the water stay in the bucket?" and related questions.

CHAPTER 11: Impulse and Momentum [Sections 11.1-11.5]

1. To understand interactions from the new perspective of impulse and momentum.
2. To learn what is meant by an isolated system.
3. To apply conservation of momentum in simple situations.
4. To understand collisions and explosions.

CHAPTER 9: Work and Kinetic Energy [Sections 9.1-9.6]

1. To explicitly use systems-based thinking to develop a model of energy—what it is, how it is transformed, and how it is transferred.
2. To introduce the concepts of work and kinetic energy.
3. To learn Hooke's law for springs and the new idea of a restoring force.
4. To introduce a model of thermal energy and dissipative forces.

CHAPTER 10: Interactions and Potential Energy [Sections 10.1-10.7]

1. To expand the basic energy model by introducing potential energy.
2. To learn to use and interpret energy bar charts and energy diagrams.
3. To develop a complete statement of the energy principle and to apply the energy principle to isolated systems in which energy is conserved.

CHAPTER 12: Rotation of a Rigid Body [Sections 12.1-12.11]

1. To extend the particle model to the rigid-body model.
2. To understand the equilibrium of an extended object.
3. To understand rotation about a fixed axis.

4. To understand rolling motion.
5. To introduce the vector description of rotational motion and angular momentum.

CHAPTER 16: Traveling Waves [Sections 16.1-16.3]

1. To use the wave model and understand how it differs from the particle model.
2. To visualize wave motion and develop intuition about waves.

Course Policies

Attendance

- **Expectation on Face-to-Face Courses (including labs):** Students in the face-to-face courses and lab courses are expected to attend all of their scheduled University classes and to satisfy all academic objectives as defined by the course instructor (University Policy, FPU-5.0010AP).
- Attendance and Class Participation: **Actual physical attendance and participation in the classroom will account for 10% of the student's course grade**.

- **Excused Absences:**
  - Students with excused absence are allowed reasonable time to make up the missed works without any reduction in the assigned work or final course grade as a direct result of the absence. Extra credit points, if present, that are based on attendance typically are not awarded when a student is absent. Excused absences from class for any of the following reasons: religious observances of student's faith, legal responsibilities (jury duty, court obligations), military obligations, university-sponsored events, death or serious illness within the student's immediate family, or student's own illness, or other reasonable circumstances.

- **Excused Absences due to COVID-19 and Attendance Exception:**
  - In addition to the standard excused absence reasons given above, legitimate, and difficult to document reasons for missing classes will be considered for the excused absence list. Some of these excused absence reasons are,
    - **i.** *Experiencing common COVID-19 symptoms.*
    - **ii.** *Exposure to COVID-19 and need to be quarantined.*
    - **iii.** *COVID-19 positive and are required to isolate.*
    - **iv.** *Family illness.*
    - **v.** *Increased anxiety and mental health issues.*
    - **vi.** *Be in a CDC-identified high-risk category.*
  - Students, of course, are responsible for communicating their situation to the course instructor in a timely manner and utilizing CARE services for support (given in the CARE services section below). The attendance rules will be flexibly handled by your instructor for students as a direct result of concerns with COVID-19. Therefore, the attendance standards and exceptions will be handled by your course instructor case-by-case basis in this excuse absence due to COVID-19 category. Based on your specific situation, your course instructor may resolve the issues using their capacity or if necessary, after consulting with other department colleagues who are teaching the same course, or department chair, or division director, or student affairs, or Provost's Office

Students Feeling Sick

I am a student; what should I do if I think I may have COVID-19?
Students who are showing symptoms or who have been exposed to COVID-19 are expected to stay in their residences (at home or in their dorm rooms) and immediately notify the FL Poly CARE manager at care@floridapoly.edu. The CARE Manager will work with each student to triage their individual situation and the CARE Manager will notify faculty of students who are not attending courses due to COVID-19 symptoms.

Students Responsibilities

Students are expected to take full responsibility for their learning and one way that is demonstrated is by rigorous attendance and participation in class.

a) Meet the requirements for all work for this course include all attendance requirements mentioned above.

b) Know the due dates and attendance requirements for this course.

c) Inform the course instructor of absences in advance if possible, or as soon as possible afterward. See the list of excused absences and Covid-19 for university-specified excused absences and Covid-19 leniencies listed in the attendance standards policy above.

d) **Possible Consequences of Attendance:** *Please follow the course syllabus "Attendance Policy" section to avoid possible consequences of unexcused absences.*

Late Work/Make-up work

For any late work, the instructor will evaluate case by case depending on both type of the excuse of absence and the type of the missing assignment.

Grading Scale

Include the grading scale that will be used in the course. (See also University Grading Policy).

- A ≥93
- A- ≥90 and <93
- B+ ≥87 and <90
- B ≥83 and <87
- B- ≥80 and <83
- C+ ≥77 and <80
- C ≥73 and <77
- C- ≥70 and <73
- D+ ≥67 and <70
- D ≥63 and <67
- D- ≥60 and <63
- F <60

Assignment/Evaluation Methods

A student's class grade will be determined by performance on assignments and tests weighted according to:

Exam 1	15%
Exam 2 (Mid-term Exam)	15%
Exam 3	15%
Homework	20%
Attendance	5%
Quizzes, Pre- and Post- Tests	5%
Final Exam (Comprehensive)	25%
Total	100%

All exams are common exams, meaning that all exams will be administered on a common timeframe and location for all the sections of the same course. Common question paper will be administered across all the sections of the same course.

- **Exams:** Three exams will be administered, covering roughly 3-4 chapters, and consisting of problem-solving and/or conceptual questions. Information about each exam will be given in the weeks prior to the exam. Unless otherwise specified, the final exam and all in-class exams are **closed book exams**. No notes or other resources are allowed unless otherwise specified. Absolutely ***no use of cell phones during these exams***. It is your responsibility to have a functional calculator for the classroom, homework assignments, and exams. If you do not have a calculator, you may be penalized a small amount or required to complete the problem in an alternate form, at the instructor's discretion.

- For missed exams, make-up work is at the instructor's discretion. Decisions will be made on a case-by-case basis in accordance with university policy. **It is your responsibility to be present for all exams**. If you require ASC accommodations, **remind me** in the week prior to the exam. You are responsible for making arrangements with the ASC.

- **Final Exam:** ***The final exam is mandatory and comprehensive***. **It cannot be substituted by any of the previous exams or homework scores.** Final exam questions will be designed to allow students to demonstrate that they master all the segments of the course and that they are able use the acquired knowledge to solve problems. ***Final exam will be administered during the final's week as per the Academic Calendar***.

- **Lecture Expectations:** Lectures meet for 75 minutes, resp. 50 minutes, on TR, resp. MWF minutes, two, resp. three, times per week. The intent of the lectures is for the student to develop conceptual understanding, practice problem-solving, work on representing physical situations, and improve observation and thinking skills. The lectures will be

interactive. Students are expected, at appropriate times, to work with classmates, express their thoughts, ask and answer questions, discuss ideas, patiently listen to and respect others' ideas.

- **Classroom Rules: No laptops/tablets allowed during class**, except if specifically required for disability accommodations or permission is sought **in advance** from the instructor. Studies show that notetaking by hand enhances comprehension and recall, while laptops distract not just the user but surrounding students as well. Cell phones must be on silent/mute mode and should not be used to the extent that they disturb other students or distract from class participation.

- **CANVAS Policy:** Assignments, announcements, and information will be posted on CANVAS. **Students are responsible for checking CANVAS regularly to be aware of their assignments** and other class information.

- **Email Policy:** All students are required to use the **studentuserID@floridapoly.edu** email system OR the CANVAS e-mail system to communicate with the instructor. On occasions, email may be used to disseminate important class-related assignments, announcements, and information. Students are responsible for any information or assignments given in e-mail.

- **Late Work/Make-up work**: All class assignments will have due dates communicated at the time of assignment. Acceptance of late or make-up work is at the instructor's discretion. Decision will be made on a case-by-case basis in accordance with university policy. **It is the student's responsibility to know the deadlines and turn work in ON TIME.**

- **Homework:** Out of class weekly homework assignments will be posted in canvas based on the lectures presented in the classroom. Students will work on these homework assignments systematically and submit their assignments by the due date set forth by the instructor. At least one problem in each homework assignments listed in the table below will be turned in to the instructor via paper copy or via canvas based scanned digital submissions that reflects step-by-step solving of a problem, with three significant values and correct units. Instructors will provide the feedback for the turned-in homework assignment based on the rubrics.

- **Quizzes, Pre, and Post Tests:** Online Diagnostic tests based on the prior subject knowledge and the acquired knowledge over the semester will be tested with pre- and post- test, respectively. Time to time, quizzes will be given during the class session based on the concepts or problem solving, to assess the performance of the class over the semester. The participation is very mandatory for the diagnostic tests and the in-class quizzes.

University Policies

Basic rules for in the classroom, IST, and Campus

1. We highly recommend, until further notice, that you wear your face-covering during class and throughout the building at all times.
2. Absolutely **no eating or drinking** during class.

Reasonable Accommodations

Florida Polytechnic University is committed to assisting students with disabilities and offering reasonable accommodations to those with documented eligibility. The Office of Disability Services (ODS) coordinates accommodations for students with disabilities in accordance with the ADA Amendments Act of 2008 (ADAAA), the Americans with Disabilities Act of 1990 (ADA), and Section 504 of the Rehabilitation Act of 1973. Reasonable accommodations are determined on an individual basis through an interactive process between you, ODS, and your instructor(s). If you have already registered with ODS, please ensure that you have requested an accommodation letter for this course and communicate with your instructor about your approved accommodations at your earliest convenience. If you are not registered with ODS but believe you have a temporary health condition or permanent disability requiring an accommodation, please contact ODS as soon as possible.
The Office of Disability Services (ODS):
DisabilityServices@floridapoly.edu
(863)874-8770
ASC East building
ODS website: www.floridapoly.edu > Student Affairs > Health Wellness > Disability Services

Accommodations for Religious Observances, Practices and Beliefs

The University will reasonably accommodate the religious observances, practices, and beliefs of individuals in regard to admissions, class attendance, and the scheduling of examinations and work assignments. (See University Policy.)

Title IX

Florida Polytechnic University is committed to ensuring a safe, productive learning environment on our campus that prohibits sex discrimination and sexual misconduct, including sexual harassment, sexual assault, dating violence, domestic violence and stalking. It is important for you to know that there are resources available if you or someone you know needs assistance. You may speak to your professor, but your professors have an obligation to report the incident to the Title IX Coordinator. It is an

educational goal that you feel able to share information related to your life experiences in classroom discussions and in one-on-one meetings. However, it is requirement for university employees to share information with the Title IX Coordinator regarding disclosure. However, please know that your information will be kept private to the greatest extent possible. You will not be required to share your experience. If you want to speak to someone who is permitted to keep your disclosure confidential, please seek assistance from the Florida Polytechnic University Ombuds Office, BayCare's Student Assistance Program, 1-800-878-5470 and locally within the community at Peace River Center, 863-413-2707 (24-hour hotline) or 863-413-2708 to schedule an appointment.

Academic Integrity

All students must commit to the highest ethical standards in completion of all academic pursuits and endeavors, whether in classroom or online environments: Academic Integrity.

Student Record of Lectures

Students may, without prior notice, record video or audio of a class lecture for a class in which the student is enrolled for their own personal educational use.

Recordings may not be used as a substitute for class participation or class attendance. Recordings may not be published or shared in any way, either intentionally or accidently, without the written consent of the faculty member. Failure to adhere to these requirements is a violation of state law (subject to civil penalty) and the student code of conduct (subject to disciplinary action).

Recording class activities other than class lectures, including but not limited to lab sessions, student presentations (whether individually or part of a group), class discussion (except when incidental to and incorporated within a class lecture), and invited guest speakers ***is prohibited****.*

For further information, go to the Registrar's webpage and click on HB233 Guidance.

Course Schedule

*Exams dates are tentative. Please refer to the examination schedule issued by the Registrar Office.

Dates	Topic Schedule	Out of Class Homework Due
Week 1 (Aug 23-26)	Syllabus Concepts of Motion	**Pre-test (Online)**
Week 2 (Aug 29 – Sept 24)	Kinematics in One Dimension	Homework Assignment
Week 3 (Sept 5 - 11)	**Labor Day Holiday (Mon)** Kinematics in One Dimension Vectors and Coordinate Systems	Homework Assignment
Week 4 (Sept 12 –18)	Kinematics in Two Dimensions **Exam 1**	Homework Assignment
Week 5 (Sept 19 –25)	Kinematics in Two Dimensions	Homework Assignment
Week 6 (Sept 26 – Oct 2)	Force and Motion	Homework Assignment
Week 7 (Oct 3 - 9)	Force and Motion	Homework Assignment
Week 8 (Oct 10 – Oct 16)	Dynamics I: Motion Along a Line **Midterm exam**	Homework Assignment
Week 9 (Oct 17 - 23)	Dynamics I: Motion Along a Line	Homework Assignment
Week 10 (Oct 24 - 30)	Newton's Third Law Dynamics II: Motion in a Plane	Homework Assignment
Week 11 (Oct 31 – Nov 6)	Dynamics II: Motion in a Plane Impulse and Momentum	Homework Assignment
Week 12 (Nov 7 -Nov 13)	**Veteran's Day Holiday (Fri)** Work and Kinetic Energy **Exam 3**	Homework Assignment
Week 13 (Nov 14 - 17)	Interaction and Potential Energy	Homework Assignment
Week 14 (Nov 21 - 27)	**Thanksgiving Break (Wed through Fri)** Rotational Motion of Rigid Bodies	Homework Assignment
Week 15 (Nov 28 – Dec 4)	Oscillations and Waves	Homework Assignment
Week 16 (Dec 5 – 15)	**Dec 8-9 (Thur - Fri) Reading Days** Review for Final Exam **Dec 10, 12-15 Final Exams**	**Post-test (Online)**

Homework Assignments

Homework problems will primarily be assigned using the **Mastering Physics** system, supplemented by assignments posted on CANVAS, via handouts or by other means. Assignments and due dates will be indicated on CANVAS. Students should expect homework weekly. Late homework is only accepted at the instructor's discretion and will likely incur a grade penalty.

Since the Mastering Physics server may undergo unexpected maintenance, be sure to start the assignments early and turn in your answers steadily, rather than all on the last day. Answers can be entered individually. Most answers are numerical on Mastering Physics and need to be within a certain tolerance **(2%)** of the correct answer. Use three significant digits to enter your answer; do not round off intermediate calculations. You get instant feedback as to whether the answer is correct or not. You usually have up to 5 attempts to get the correct answer. Solutions become available right after the due date/time.

Chapter No.	Solved Examples from Textbook	Common Homework Exercises and Problems from the Knight 4th ed.
CH 1 – Concepts of Motion	EX1: 1.1, 1.3, 1.5, 1.7, 1.9, 1.10	HW1: 1.24, 1.28, 1.54, 1.56, **1.58**
CH 2 – Kinematics in 1D	EX2: 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.10, 2.13, 2.15, 2.16	HW2: 2.3, 2.40, 2.42, 2.68, **2.70**
CH 3 – Vectors and Coordinate Systems	EX3: 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7	HW3: 3.4, 3.8, 3.16, 3.24, **3.32**
CH 4 – Kinematics in 2D	EX4: 4.1, 4.2, 4.3, 4.4, 4.5, 4.7, 4.8, 4.9, 4.11, 4.12, 4.14	HW4: 4.6, 4.8, 4.18, 4.30, **4.32**
CH 5 – Force and Motion	EX5: 5.1, 5.2, 5.3, 5.4, 5.5, 5.6	HW5: 5.6, 5.10, 5.12, 5.14, **5.34**
CH 6 – Dynamics I: Motion Along a Line	EX6: 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.10	HW6: 6.3, 6.8, 6.24, 6.28, **6.36**
CH 7 – Newton's Third Law	EX7: 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.8,	HW7: 7.6, 7.8, 7.10, 7.12, 7.14, **7.23**
CH 8 – Dynamics II: Motion in a Plane	EX8: 8.1, 8.2, 8.3, 8.4, 8.5,	HW8: 8.2, 8.6, 8.16, 8.18, 8.28, **8.36**
CH 11 – Impulse and Momentum	EX11: 11.1, 11.2, 11.5, 11.6, 11.8, 11.9	HW9: 11.8, 11.14, 11.18, 11.26, 11.32, **11.48**
CH 9 – Work and Kinetic Energy	EX9: 9.2, 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.11, 9.12	HW10: 9.2, 9.26, 9.32, 9.36, **9.45**
CH 10–Interactions and Potential Energy	EX 10: 10.1, 10.2, 10.3, 10.4, 10.5, 10.7, 10.8, 10.10	HW11: 10.5, 10.9, 10.18, 10.37, **10.42**
CH 12 – Rotation of a Rigid Body	EX 12: 12.1, 12.2, 12.3, 12.4, 12.5, 12.7, 12.8, 12.9, 12.11, 12.15, 12.16, 12.17, 12.19	HW12: 12.6, 12.12, 12.22, 12.26, **12.32**
CH 16 – Traveling Waves	EX16: 16.1, 16.2,	Instructor choice.
NOTE: The homework problem in bold font and underlined are to be turned in with detailed solution.		