PHY 1010 - General Physics I • 4 Credit Hours (with Lab)

PHY 1080 – Principles of Physics I • 4 Credit Hours (no Lab)

MWF between 2:40pm to 3:47pm

Sep 03 – Dec 15 FALL 2020

THIS IS A FULLY ONLINE COURSE

Instructor: Dr. JYOTHI RAMAN

Contact: raman2@oakland.edu

Contact me through QUICK MAIL within Moodle or direct email

Face-to-face contact is not available this term.

Course TA (Teaching Assistant): Cody Trevillian   trevillian@oakland.edu

Course S.I. (Supplemental Instruction) Tyler Glass tylerglass@oakland.edu

Office hours: upon request – by phone or audio/video conferencing

This is an ONLINE course and lectures will not be live during class meeting times.

Online Class Exams will be during the original class times of MWF between 2:40pm to 3:47pm.

Course Management System: Moodle: Weekly List of Schedule

Course Home-Work/Exams: WebAssign

Supplemental Instruction will be offered online. Log in to E-space at **espace.oakland.edu** to attend live sessions of SI with your peers, meet virtually with your SI Leader to ask questions, and access additional study resources. Please check your OU email frequently for updates from your SI Leader. Tutoring will also be available online. For more information, please visit **oakland.edu/tutoring**

Course (Catalog) Description: Mechanics, heat, mechanical waves and sound.

Topics include:

Mechanics: Linear Motion in one and two dimensions; Newton's Laws of Motion and their applications to our everyday world; Mechanical Energy--potential and kinetic; Energy transfer; Work. *Rotational Motion. The Gravitational Field;* the Law of Universal Gravitation; Kepler's Laws of Planetary Motion; the Hydrogen atom. *Oscillatory Motion:* Harmonic Motion; Pendulum and Damped Oscillations. *Mechanical Waves:* Reflection and Transmission of Waves.

Thermodynamics: Temperature and Kinetic Theory of Gases; Thermal Energy and Heat; the Laws of Thermodynamics and their applications.

Prerequisites: Score of 22 or higher on ACT math test or 550 or higher on SAT math test; or MTH 0662 or equivalent, or placement above MTH 0662.

Corequisite for PHY 1010: PHY 1100 – General Physics Lab I.

PHY 1010 (4 credits with Lab) satisfies the university general education requirement in Natural Science and Technology knowledge exploration area.

PHY 1080 (4 credits, no lab) does **not** satisfy the university general education requirement.

Equipment: Basic scientific calculator with trigonometric functions, angle measure in degrees and radians, logarithms.

- **General Education Learning Outcomes for PHY 1010/1080:**

This course satisfies the university general education requirement in Natural Science and Technology (NST) knowledge exploration area. The learning outcomes for NST courses state that the student will demonstrate:

- Knowledge of major concepts from natural science or technology, including developing and testing of hypotheses; drawing conclusions; and reporting of findings through some laboratory experience or an effective substitute (Laboratory experiences are met by either a limited number of interactive experiences, collecting and interpreting raw data, or other effective experiences such as a virtual laboratory). Requires at least 3 laboratory experiences during the course.

- How to evaluate sources of information in science and technology.

- In addition to the general-education learning outcomes, this course also satisfies the cross-cutting capacity of *Critical Thinking*.

Course Goals and Objectives:

Goals of this course include becoming aware of basic concepts and principles of physics; learning to utilize mathematical methods to analyze physical situations; strengthening the understanding of concepts and principles through a broad range of applications to our daily world, including applications to other disciplines such as biology and medicine and applications relating to modern technology. Strong emphasis is given to conceptual learning, to strengthen the student's logical and critical capacities.

Upon completion of the course, the student will be able to:

- Utilize general methods of problem solving to sharpen his/her critical thinking capacity.
- Convert between systems of units and use these as an aid in problem solving.
- Add and subtract vectors graphically and be able to resolve them into components.
- Describe the motion of an object moving in one dimension.
- Describe the motion of an object moving along a curved path; apply kinematic equations
- Construct free-body diagrams and use these to analyze mechanical systems using Newton's Laws of Motion.
- Analyze the motion of a satellite in a circular orbit, as well as other objects moving in circular paths.
- Utilize the principle of Conservation of Energy to solve problems, such as the motion of a roller coaster.
- Utilize the principle of Conservation of Linear Momentum to solve problems, such as a collision between two cars.
- Describe the motion of an object moving in a circular path using angular quantities.
- Apply Newton's Laws to circular motion and understand the concepts of torque, moment of inertia, and angular momentum.
- Understand the dynamics of a mass-spring system and an oscillating pendulum.
- Compare concepts of pressure and density in solids, liquids, and gases and apply to medical phenomena.
- Convert temperature readings in one scale to any other and apply concepts of specific heat and latent heat to thermal transfer situations, such as cooking.

- Analyze the behavior of gases utilizing the Ideal Gas Law.
- Apply the Laws of Thermodynamics to systems and relate them to the increasing entropy of the universe.
- Calculate the efficiency of any engine that utilizes heat transfer.

Textbook: **Serway/Vuille: College Physics – 11th Edition packaged with:**

- WebAssign – Multi-term Access Card

- Access to the e-book

- Access to Student Study Guide and Solutions Manual

Cengage Publishing – ISBN: 9781337741569 [Required]

Available options for purchasing the textbook:

- You may purchase the entire 'bundle' for $190 through the Campus bookstore

- You may purchase the 'bundle' online, directly from the publisher for $161 at

  http://www.cengagebrain.com/course/4412854

Please notice:

- The Access to Web Assign is valid for multiple terms (PHY 1010 & PHY 1020)

- If you wish to *purchase **just** the access to **WebAssign***, you may do so:

  o *Online* – once you are logged in to WebAssign.net. Please see the page of the syllabus dedicated to WebAssign

  o *Bookstore* – the ISBN for the printed EWA Multi Term Access Card is 9781337763486

Getting Help:

Short videos providing a complete *review of basic Algebra and Trigonometry* are posted on the Tutoring Center's website:

wwwp.oakland.edu/tutoring/study-aids/physics-videos

Here you will find also a series of short videos showing *how to solve sample problems* for each chapter of the textbook.

You may also **contact Dr. Raman** to get help with course material, to discuss ways of improving your performance. Best is to setup an appointment by email. We can then talk over the phone, setup a Google meet or WebEx meeting.

Math Review Good Math skills are an essential pre-requisite for a Physics course. During the first week of classes, you are requested to view the *five Math Review videos* posted on Moodle. These videos summarize the *essential math* required for the course:

- *Ratios, Proportions and Units*
- *Powers, Roots and Scientific Notation*
- *Equations and Graphing*
- *Geometry and Trigonometry*
- *Significant Figures*

At the end of the week, a Math Review Homework is due on WebAssign.

Another set of math review videos, which include examples of applications to the material covered in the course, is also available on Moodle. You may want to view these as you progress through the course:

- *Equations Involving Fractions*
- *Systems of Equations*
- *Interpreting Graphs*
- *Area Under a Curve*
- *Exponentials and Logarithms*
- *Limits and Instantaneous Velocity*
- *Angle Basics*
- *Waves and Superposition*
- *Simple Harmonic Motion*

Three videos on '*How to use the Calculator*' are also available. These clarify common mistakes made when entering equations in a scientific calculator:

- *Orders of Operations*
- *Radian versus Degree*
- *Scientific Notation*

Teaching will comprise of the following four teaching modules:

- **Online Class Meetings:** There will be a few scheduled Online meetings via WebEx/YuJa during the class meeting days. This means that I will host short half-hour online sessions for important introductions/presentations etc.
- **Power Points:** Power Points for all chapters are posted on Moodle. You can print these – for example six slides per page – and use them for note taking when watching the lectures.
- **Recorded Lectures:** the URL of the recordings of in-class lectures are posted on Moodle. I will use the programs *Panopto* or *YuJa* for the recordings. To access the lectures, you will be prompted to login to the lecturecapture.oakland.edu website.
- Use *Sign in via Moodle* to view lectures at any time.
- **Demonstrations:** A number of videos of in-class demonstrations are posted on Moodle. You will also find on Moodle pointers to a number of good YouTube videos recorded by other institutions.
- **Math Review**: A list of useful Math review links are available on course page.
- **Supplemental instruction**: The S.I. leader for this course is @oakland.edu). He will provide more details during first week of class.

Supplemental Instruction will be offered online. Log in to E-space at espace.oakland.edu to attend live sessions of SI with your peers, meet virtually with your SI Leader to ask questions, and access additional study resources. Please check your OU email frequently for updates from your SI Leader. Tutoring will also be available online. For more information, please visit oakland.edu/tutoring

<u>**Homework**</u>: The online program WebAssign will be utilized for entering, and automatic grading of, the homework. This requires the Access Card bundled with the textbook.

Each chapter's homework consists of a mix of Active Examples, Problems, Conceptual Questions, Active Figures.

The homework for each chapter can be submitted a *maximum of 5 times*.

Accessing WebAssign: see attached sheet.

Due time: The assignments are due at 11:59 pm on the specified date.

Extensions: Only in case of serious and *documented* circumstances a deadline extension may be granted. Please send an e-mail to raman2@oakland.edu *before* the deadline. You can apply for a one-time automatic extension via WebAssign. This allows you to get an extension for just one assignment with a 10% late penalty.

Grace period: there is a 14-day grace period in WebAssign during which you may do the homework & study the e-book even if you do not have an Access Code yet.

Algebra Review: this tool is available on WebAssign. It provides the students with a self-paced environment for extra practice with the mathematical skills required for success in the physics course.

Chapter Activities: For each chapter, Conceptual Questions/Activities will be posted on Moodle. These are intended to stimulate Critical Thinking.

All Chapter Activity files should be in pdf or word format and submitted directly to the Moodle drobox. Course TA, Cody Trevillian, will grade these activities as well as handle all questions pertaining to it. His email is:

trevillian@oakland.edu

No late answers will be accepted after the due date.

The Chapter Activity/Questions are worth 15% of the final grade.

Quizzes: Quizzes are worth 5% of your grade. These will include Syllabus Quiz on Moodle as well as Reading and Lecture Quizzes during the semester.

Exams: There will be *three online exams* on WebAssign in the form of problems and conceptual questions. These exams are open book, have the duration of 1 hour, and MUST be taken between 2:40pm – 3:47pm on the specified dates. Once you access the exam, you cannot take breaks – you have to continue until you are done. Best practice is to prepare a sheet with formulas and short notes/examples for each chapter. Exam 3 is a final exam and no other Exams will be given during the Finals Week.

Exam # 1	**Chapters 1, 2, 3, 4**	**Sep 30th, Wed**
Exam # 2	**Chapters 5, 6, 7, 8**	**Oct 28th, Wed**
Exam # 3 (Final Exam)	**Chapters 10, 11, 12, 13**	**Nov 30th, Mon**

The online exams are worth 45% of the final grade.

Exam 1: 15%, Exam 2: 15%, Exam 3: 15%

Make-up Policy: In order to be fair to the majority of students who take the exams on time,
the general policy is**:** *no make-up exams* will be given.

A score of zero will be assigned for any missed test.

Only in rare cases of serious and *well documented emergencies* an exception will be made. Please contact the instructor as soon as possible.

Please notice: you cannot pass the course unless you have taken all three exams.

Study Tips: In order to develop *Critical Thinking*, which is one of the main goals of this course, much emphasis will be on the understanding and assimilation of concepts.

You are strongly encouraged to review the chapter's *Tutorials*, *Active Examples* in and the animated *Active Figure* tutorials in the *e-book and WebAssign*.

Also, in order to test your understanding of concepts you should test yourself by trying all the *Quick Quizzes* interspersed in each chapter (the answers to these are posted at the end of the textbook) and the end-of-chapter *Conceptual Questions*.

As a practice for the exams, you can try solving some of the *odd-numbered end-of-chapter problems* on the *e-book*. The answers to these are posted at the end of the textbook. You will find the end-of-chapter conceptual questions, problems and activities on the eBook within WebAssign.

Conceptual questions will be included in the Exams.

Gradebook: All grades will be posted on the *MOODLE Gradebook.*
The Gradebook will be updated regularly as new grades become available.

What your GRADE is based on:

- **Online Homework** – a mixture of guided examples, problems, conceptual questions and animated 'active' figures. 35%
- **Activity/Questions** – Conceptual questions/activities related to chapter material. 15%
- **Exams** – 3 exams in total (45%)
- **Quizzes –** 5%

Homework	**35%**
Activity	**15%**
Exams	**45%**
Quizzes	**5%**

Grading scale:

A	96-100
A-	90-95
B+	85-89
B	80-84
B-	75-79
C+	70-74
C	65-69
C-	60-64
D+	55-59
D	50-54
F	< 50

Add/Drops: The University add/drop policy will be explicitly followed.

It is the student's responsibility to be aware of the University deadline dates for dropping the course.

Reasonable Accommodations

Accessibility and Accommodations: It is the University's goal that learning experiences be as accessible as possible. Students with disabilities who have questions about course accessibility are encouraged to contact the instructor immediately. The Office of Disability and Support Services (DSS) is available to help. Currently, in-person services, such as face-to-face meetings and proctoring services, are not available. You may call the office at 248-370-3266 or visit **https://www.oakland.edu/dss** and click on **"Request Accommodation Form".**

Policy on Academic Misconduct

The University's regulations that relate to academic misconduct will be fully enforced. Any student suspected of cheating and/or plagiarism will be reported to the Dean of Students and, thereafter, to the Academic Conduct Committee for adjudication. Anyone found guilty of academic misconduct in this course may receive a course grade of F, in addition to any penalty assigned by the Academic Conduct Committee. Students found guilty of academic misconduct by the Academic Conduct Committee may face suspension or permanent dismissal. The full policy on academic misconduct can be found in the General Information section of the Undergraduate Catalog.

Excused Absence Policy

The University excused absence policy applies to participation as an athlete, manager or student trainer in NCAA intercollegiate competitions, or participation as a representative of Oakland University at academic events and artistic performances approved by the Provost or designee.
For the excused absence policy, see:
https://www.oakland.edu/provost/policies-and-procedures/

Bereavement Policy

In the event of the death of certain members within families or among loved ones, the University grants necessary bereavement absences upon student request.
For the official bereavement policy, see:
https://www.oakland.edu/provost/policies-and-procedures/

Student Preferred Name/Pronoun Policy

The University recognizes that as a community many of its members use names other than their legal names to identify themselves. As long as the use of this different name is not for the purposes of misrepresentation or a legal name is required by University business, policy or legal need, the University acknowledges that a "preferred name" will be used wherever possible. The University reserves the right to not accept a preferred name if it is deemed inappropriate, including a preferred name that is vulgar, offensive, fanciful, or creates confusion with another person.

Communication:

Instructor ▯ Student:

Communications from the instructor will happen via the **Announcements** forum in **Moodle.** These are forwarded by Moodle to your Oakland e-mail account.

- o *You are expected to be familiar with Moodle.* To check how to login to Moodle, the *Technical Requirements* and how to obtain *Support*, please go to:

    https://oakland.edu/online/resources/online-student-orientation/

- o You are expected to *login to Moodle at least twice a week* and *check your email daily*.
- o A Weekly format will be used in Moodle. Guidelines for the homework and all other activities will be posted week by week.

You will have to scroll down to check each week of the course.

Student ▯ Instructor:

- • **The best way to send me an email is via the QUICKMAIL block in Moodle. This automatically tells me the course you are in.**
- • You may send a direct email through **Oakland webmail** : **raman2@oakland.edu**

The subject of your e-mail should state course name, last name and subject.

e.g. *'Phy 1020 – Your lastname first initial – Homework # 1'*

I will read my e-mail twice a day. E-mails with no clear subject will be disregarded.

Emails after 5pm will be responded to the next day. No emails will be responded to over the weekend.

Do not send me communication through WebAssign.

Student ▯ Student:

Contacts among students may happen in a number of ways:

- o '*Questions and Answers'* Forum – setup on Moodle for students.
- o '*Introduce Yourself*' Forum – setup on Moodle so that each student can share some basic information about himself/herself with others and the instructor. Participation in this forum is *mandatory*.
- o '*Google Meet*', '*YuJa'*, or *'WebEx'* audio/video conferencing sessions can also be setup.

Virtual Office Hours:

We can setup a **Google Meet or WebEx** or **YuJa** video conferencing to discuss physics concepts, homework or solve any issues.

FORUMS: Summary

There are 3 Forums for this course. This is for Instructor to student. Student to Instructor and Student to Student communication.

Forum 1: Questions and Answers Forum: Instructor to Student and Student to Instructor as well as Student to Student.

Forum 2: Introductions Forum: Introduce Yourself

Forum 3: Student Chat Room: Student to Student discussions.

Note: All rules for of proper Netiquette must be followed. Any student who violates these rules by being disrespectful will face disciplinary action. Watch your language, tone and professionalism here.

https://youtu.be/80uRE972uQ0

View this video on Netiquette rules.

For Technical Issues, please contact:

Moodle:

Read the documents on the e-Learning & Instructional Support (e-LIS) website.

In particular, the '*Online Student Orientation'*:

https://oakland.edu/online/resources/online-student-orientation/

If this doesn't help, contact the e-LIS at **248-370-4566**

You may also submit a Help Request Form to e-LIS:

https://www2.oakland.edu/secure/esp/

Online Homework:

Go to the **WebAssign.net** website and click on 'Student Support.'

There you will find the Student Guide and instructions on how to contact Support

by phone, e-mail or live-chat. Please use help desk for all your technical issues. They are prompt and can be your first line of contact for any WebAssign issues.

Important Note from the Instructor:

Online courses have numerous advantages, including flexibility for those with a busy schedule. On the other hand, I wish to bring to your attention that *not everybody is fit for an online course.* Remember that to be fit for an online course,

- You must be able to **work independently.**
- You must feel quite **comfortable** working **with computers**.
- You must be **self-motivated** and **disciplined** in order to access all assignments in a timely manner, actively participate in discussion panels and study the textbook in a timely manner.
- You must be able to **follow directions**. Most online activities are announced with written directions. It's important that you understand what the instructor requires.
- You must be **organized**. For example, create a folder on your computer for the class. Within it create other folders for each of the class activities.

WebAssign: How to Get Started

Day One: Register

1. Go to **https://webassign.net** and click on **SIGN-IN**.

2. Click on **'Enter Class Key'**

3. Enter the **Class Key**:   **oakland 6422 9516**

4. Enter your chosen Login name and the required information

5. Click on **'Create my Account'**

> A review screen will appear with your Username, Institution code & Password.
> Print and retain a copy of this information.

6. Once you Login, you need to enter the **WebAssign Access Code**.
   - If you purchased a new textbook, the Access Code card is inside the book.
   - If you purchased a used book, you may choose to purchase the Access Code online.

7. Once you have logged in, you will see the **Homepage**.
   - I suggest you click on **Guide** (upper right corner) and read the **Student Guide**.
   - For **Technical Support** call **800-354-9706** or go to

     http://www.webassign.com/support/student-support/

Notice: there is a 14-day grace period in WebAssign during which you may do the homework even if you do not have the Access Code yet.

You may want to watch the short Student Self-Enrollment video:
http://www.wadsworthmedia.com/tlc/EWA_StudentVideos/Self_Enrollment/EWA_Student_Self Enrollment.html
To access the Homework:

1. Go to **http://www.webassign.net/wa-auth/login** (I suggest you Bookmark this page)

2. After you Login, click on **'My Assignments'.**

Please notice:

   - You may save your work without grading by clicking on **'Save Work'** at the end of the question. Next time you access the assignment, your work will still be available.

   - WebAssign will not automatically submit your answer if you only 'Save' your work. Make sure you **'Submit'** it before the due date and time.

   - You may also choose to **'Submit New Answers to Question xx'** or **'Submit All New Answers'**.

Remember that there is a **maximum of 5 submissions** for each problem.

Things to do list during the first week:

Syllabus Quiz:

During the first week of the course, you will have to take this simple quiz on Moodle
to make sure that you understand what you have to do for the course.
A nominal grade is assigned to the quiz.

Math Review Homework:

After viewing the five Algebra and Trigonometry review videos, test yourself
on your Math skills. This Math Review homework is on WebAssign.

PHY 1020/1090 SCHEDULE – Fall 2020 (Subject to Change)

Week 1: Sep 3 – Sep 4

- Read the course syllabus on Moodle, Take Syllabus quiz on Moodle.
- Enroll in WebAssign.
- Take Introduction to WebAssign Quiz on WebAssign
- Take the Math Review Home Work on WebAssign
- Introduce yourself in the Forums (Mandatory)

Week 2: Sep 8 – Sep 11

- **CHAPTER 1**
- **CHAPTER 2**

Week 3: Sep 14 – Sep 18

- **CHAPTER 3**

Week 4: Sep 21 – Sep 25

- **CHAPTER 4**

Week 5: Sep 28 – Oct 2

- **CHAPTER 5**

Online Exam # 1: Wednesday, September 30th – Chapters 1, 2, 3, 4

The exam is available on WebAssign from 2:40 – 3:47pm. It is one hour long.
Be aware that, once you start, you have to continue until you finish.
You may not take breaks. Have your calculator and scrap paper ready

Week 6: Oct 5 – Oct 9

- **CHAPTER 6**

Week 7: Oct 12 – Oct 15

- **CHAPTER 7**

Week 8: Oct 19 – Oct 23

- **CHAPTER 8**

Week 9: Oct 26 – Oct 30
- **CHAPTER 10**

Online Exam # 2: Wednesday, October 28th – Chapters 5, 6, 7, 8

The exam is available on WebAssign from 2:40 – 3:47pm. One hour long.
Be aware that, once you start, you have to continue until you finish.
You may not take breaks. Have your calculator and scrap paper ready.

Week 10: Nov 2 – Nov 6
- **CHAPTER 11**

Week 11: Nov 9 – Nov 13
- **CHAPTER 12**

Week 12: Nov 16 – Nov 20
- **CHAPTER 13**

Week 13: Nov 23 – Nov 25
- **CHAPTER 13**

Week 14: Nov 30 – Dec 4

Online Exam # 3: Final Exam: Monday, November 30th – Chapters 10, 11, 12, 13

The exam is available on WebAssign from 2:40 – 3:47pm. One hour long.
Be aware that, once you start, you have to continue until you finish.
You may not take breaks. Have your calculator and scrap paper ready.

Week 15: Dec 7 Classes end
Week 16: Dec 09 – Dec 15