**PHYS-160-004 (Spring 2020): LOGIC+**

**Tentative Syllabus – Branislav Djordjevic**

# 1 Information

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| **Course:** | **University Physics I, PHYS-160-004** |
| **Meeting:** | **MW: 3:30 pm - 5:20 pm** |
| **Room:** | **Exploratory Hall L102** |
| **Text:** | **Young & Freedman, University Physics with Modern Physics, 13e, or 14e**<br>**We will not use any Mastering products, so you don't need to purchase any access.** |



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| **Instructor:** | **Branislav R. Djordjevic, PhD** |
| **Office:** | **Planetary Hall 201B** |
| **Phone:** | **703-993-5380** |
| **Email:** | **bdjordje@gmu.edu** |
| **Office Hours:** | **M&W: 11 am -12pm, and 1 pm – 3 pm; T&TH: 3 pm – 5 pm.**<br>Please, announce your visit via email, so that I don't step out of my office when you come. |



# 2 Active Learning

## 2.1 Philosophy

This is an Active Learning course and will have a very different format from the traditional lecture style. Please read the following sections carefully so that you understand what Active Learning entails.

**This is not a lecture course**. Students in this class will engage in active learning which will require preparation before class begins, group efforts, class participation, investigative research and hands-on work. See **Section 4** for more details.

## 2.2 The Rules of LOGIC+ (Lecture Online, Group work In Class) Physics (from students' experience)

1. Watch and re-watch Videos, PPT lectures, and other material provided in Blackboard, BEFORE you come to class!
2. Help thy neighbor – engage in discussions with your colleagues and help each other!
3. Ask questions!

## 2.3 Class Room

The ALT (Active Learning Tech) classroom has 8 tables each with 9 seats, and many whiteboards around the classroom. Each table will hold 3 groups of 3 students each. Students will engage in collaborative, active learning. Exams are NOT group activities – they are to be completed by individuals.

### 2.4 Student Responsibilities

Students in this class will need to assume the following responsibilities:

1. Read the appropriate section in the textbook and watch videos before class time. Most chapters will have two class days. Watch all videos before the first class.
2. Do your weekly problems in time – by Sunday midnight. Your solutions of selected problems (you will find them in Blackboard, together with solutions) will not be graded, but if you try to solve them by yourself, BEFORE you look at the solutions, you will dramatically increase your chance to end up with an A in this course.
3. Be investigative and creative – use other resources (e.g. YouTube).
4. Productively work in groups while in class.
5. Participate in class activities.

### 2.5 Required Supplies:

- A set of white-board markers. EXPO brand
- Composition notebook

### 2.6 Openness

Students will be asked to provide honest and frequent feedback that will be used to optimize the course in the future. Your inputs are very important in creating an effective learning environment.

Students should expect frequent polls from the instructor, P&A department, or the Provost's office. These polls are often anonymous and are used to create a better course. Honesty is essential and highly encouraged.

## 3 Class Format:

Class sessions will often contain the following procedures:

- Introduction and Announcements
- Up to 20 minutes mini "lectures" on the subject for that session
- Conceptual Quizzes Discussions
- Problem solving **on whiteboards**
- I and my two learning Assistants will walk around and help you in your problem-solving efforts, by pushing you in the right direction.

### 3.1 Conceptual Quizzes

The purpose of the Conceptual Quizzes is to test the broad concepts that students obtained from the reading/video material. These will not be graded, so I expect nice and relaxed discussions.

## 4 Graded Assignments and Activities

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|---|---|
| **Mid-Term Exams, 15% each (x 4)** | **60%** |
| **Final exam** | **25%** |
| **Class Participation** | **10%** |
| **Attendance** | **5%** |
| | |
| **TOTAL** | **100 %** |

### 4.1 In-class Participation

The ALT room requires students to participate in groups. Deductions will be given for students that fail to participate. This includes students that text or participate in social networking during class. This also applies to students that do work on their own and do not share with their group or participate in their group. Excepting exams all activities in the ALT room are performed in groups. If you don't participate in class work, you will be kindly asked for your name by me or my two learning assistants.

### 4.2 Grading Scale

| Percentage | Grade |
|---|---|
| >= 97 | A+ |
| >= 90 | A |
| >= 87 | B+ |
| >= 80 | B |
| >= 77 | C+ |
| >= 70 | C |
| >= 60 | D |
| < 60 | F |

### 4.3 Dropping Scores

- There will be 4 Exams plus comprehensive final. No exam **will not** be dropped.
- There are NO makeups of the exams.
- BUT - students will be rewarded for continuous improvement from exam to exam, especially on the final comprehensive exam.

### 4.4 Exams

- Students are expected to bring the following items to each exam:
  1. A Calculator (see comments following this list)
  2. 2 sides - 1 page (8:5 X 11) handwritten formula sheet (no photocopying).
  3. Pencil or pen.
- Students are required to have a scientific calculator. During exams devices such as cell phones, tablets and laptops will not be allowed.
- There will be no bathroom breaks during the exam. Once you leave you are done. Please do NOT drink 3 cups of coffee before the exam.
- The final exam is comprehensive. Its date will be scheduled by the University at later time.

### 4.5 Extra Credit: NONE!

## 5 Physics Tutor

P&A department has a dedicated tutor: **Dr. Shalom Fisher** - Planetary Hall 2A. Check department office (Planetary Hall room 203) for tutor schedule

## 6 Online Portals

This course will use **Blackboard** to post announcements and grades. It will host the videos and other course materials. There are NO OTHER online portals needed.

## 7 Resources

Learning Services https://learningservices.gmu.edu/
Student Support and Advocacy Center https://ssac.gmu.edu/
Counseling and Psychological Services https://caps.gmu.edu/

## 8 Honor Code

http://oai.gmu.edu/honor-code

Violations of the Honor Code include but are not limited to:

- Copying work from other students (even if it is from other schools and other semesters).
- Copying work from other documents without citation.
- Copying exam answers.
- Having someone else do your work.

If there are any questions please ask me so we can clarify the situation. The main reason that people cheat is because they get behind. It would be much better to meet with me about the situation rather than attempt to cheat.

## 9 Tentative Schedule (see the table on the next page):

This schedule can change due to unforeseen circumstances. If this happens an announcement and a revised schedule will be posted on Blackboard. It is probable that there will be changes in the last few chapter

**Tentative Schedule:**

| Week of (**MON**) | **Chapters** |
|---|---|
| 01/20 | Ch. 1 Introduction; vectors, math review |
| 01/27 | Ch. 2 Kinematics in 1D |
| 02/03 | Ch. 3 Kinematics in 2D |
| 02/10 | **Test 1 Chapters 1-3 (2/10, Monday)**<br>Ch. 4 Newton's Laws |
| 02/17 | Ch. 5 Application of Newton's laws |
| 02/24 | Ch. 6 Work, Kinetic Energy<br>Review for Test 2 |
| 03/02 | **Test 2 Chapters 4-5 (3/2, Monday)**<br>Ch.7 Potential Energy, Conservation of Energy |
| **03/9** | **SPRING BREAK**<br><br>**No classes** |
| 03/16 | Ch.8 Linear Momentum |
| 03/23 | Ch.9 Rotational Kinematics |
| 03/30 | **Test 3 Chapters 6-8 (3/30, Monday)**<br>Ch.10 Rotational Dynamics |
| 04/06 | Ch.10 Rotational Dynamics<br>Ch. 11, Equilibrium |
| 04/13 | Ch.13 Gravitation<br>**Test 4 Chapters 9-11 (4/8, Wednesday)** |
| 04/20 | Ch.13 Gravitation<br>Ch. 14 Oscillations |
| 04/27 | Ch. 14 Oscillations |
| 05/4 | REVIEW (Chapters 1-14)<br>Monday is the last day of classes |
| **5/8** | **Final Test (Comprehensive) TBD** |

**Important Dates:** See: https://registrar.gmu.edu/calendars/fall-2019/

## Advice for Successful Study

Scientific research on effective learning has shown that students must actively think about and apply concepts in order to learn. Passively consuming information does not yield durable learning.

In this course, the only way to really learn well is to solve lots of physics problems. Problems will be posted (but not collected or graded). Detailed solutions will be posted as well. Work the problems on your own, consult the solutions if you get stuck, go through the posted solution carefully once you've finished the problem (since the posted solution might contain additional insight or a more efficient method of solution), and redo the problems that challenged you after a couple of days or more have passed. Also make note of any questions or issues that weren't resolved by the posted solutions so you can ask about them in class, recitation, or office hours. If you have time to work on more problems besides those that are assigned, this will further help your learning. There are lots of problems at the end of each chapter to choose from, and the instructors, and department tutor will be happy to go over the solutions with you.

The other facet of active learning in this course is active reading. When reading the assigned sections in the textbook, constantly challenge yourself to make sure you understand the content. For example, check that you can provide the mathematical steps in derivations and in the example problems and try to express the text's logical arguments in your own words. Again, make note of anything you don't understand so you can ask about it.

Any of the material in the assigned reading could potentially appear on exams, whether it was explicitly covered in class or not. The same is true of the posted problems in Blackboard—all are fair game for exams, whether we ever discuss them explicitly in class, or not. However, you should not expect that exam problems will be selected from the posted problems. You must take responsibility for your own learning and recognize the instructors as facilitators of your learning. Keep up with the reading and problem solving and ask for help whenever needed.

Education research has also shown what most of us know from experience—that cramming is not an effective way to learn. That's why there are four in-class exams, in the hope that it will force you to continually keep up with the material.

Solving lots of physics problems and actively reading the textbook will consume a lot of time and require serious concentration. It's essential to schedule significant blocks of uninterrupted time for study. Make a schedule that includes enough study time and be sure to stick to it. And set up your work environment to keep distractions, like your phone, away. It's not easy to develop time-management and concentration skills, but it's well worth it, since they'll help you succeed in all parts of your life, not just in school.