

# Physics for Future Presidents and World Leaders

FSEM PHYS100-K1-Syllabus Fall-17

*University of Mary Washington  
Department of Physics*

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**Required Text:** NONE

- Journal articles on Canvas from Physics Today, Nature, and Science

For successful completion of the course, it is recommended that entering students have a solid background in high school level algebra and trigonometry.

**Course Description:** With emphasis on close reading, careful listening, civil discourse, logical reasoning and with a format that requires students to apply these skills to real-world situations, the course encourages the development of social skills and fosters a connection between students and the community. The course covers interesting, relevant, important and timely topics. These topics include, but are not limited to, Energy, Atoms, Gravity, Light, Health, Satellites, Remote-Sensing, Radioactivity, Nuclear Reactors, Atomic Bombs, and Global Warming.

**Course Objectives:** The course is designed to introduce and increase students' working knowledge of elementary physics principles, develop and sharpen their critical thinking process, improve their problem solving skills, and prepare them to articulate effectively. The course gives future world leaders, University of Mary Washington Students, the knowledge and understanding that they need to make informed decisions and not be intimidated by technological advances.

**Canvas:** Lecture notes and communications are sent via emails and posted on Canvas. There are opportunities throughout the semester to earn extra credit points via discussions in lectures. Therefore, it is to your benefit to show up for class and be ready to discuss the topics.

**Individual Help:** Any student who wishes individual help is encouraged to see me during my office hours, or other times by appointments ([mmagrakv@umw.edu](mailto:mmagrakv@umw.edu) , [hnguyen@umw.edu](mailto:hnguyen@umw.edu) ).

**Honor Code:** Make sure you read and understand your Honor Pledge.

**Plagiarism:** Plagiarism and cheating are serious offenses and may be punished by failure on the exam, paper or project; failure in the course; and/or expulsion from the university.

**Note:** If you have any condition such as a physical or learning disability, which will make it difficult for you to carry out the work as I have outlined it or which will require academic accommodations, please notify me.

### **General Intended Student Outcomes:**

This course satisfies the FSEM general education requirement at the University of Mary Washington. As such, upon successful completion of this course, students will

- utilize a variety of research techniques to retrieve information efficiently, evaluate retrieved information, and synthesize information effectively to support their messages or arguments;
- improve development and organization of written arguments;
- demonstrate the ability to edit and revise in the writing process;
- apply the basic theories and principles of oral communication;
- communicate effectively in a variety of settings, including public speaking and group discussion.

### **Homework and in class discussions:**

HW is Assigned readings from books and other media. A tentative course schedule is given below. Students are required to read about and to research the discussion topics from multiple sources for each week. Each student will come into class with a written summary of a talking point. Each talking point summary is a paragraph composed of 8-10 sentences. We will use the summaries to start the discussions in class. The instructor will collect the summaries after the discussion. Valuable feedback will be given to the students to improve summary writing effectiveness.

### **Group project:**

Two students will form a group to prepare final write –up and presentation.

Many interesting articles from various publications (ex: Physics Today, Science, and Nature) that are related to topics in class will be posted on Canvas.

**Writing:** Each group is required to write a **four or five-page** assessment to be handed in near the end of the semester (week 13). The students will use the topics in class to do research and write the assessment about a specific topic of their interests. **Students will use lecture notes, assigned readings, in class handouts, and multiple sources to formulate an assessment of the chosen topic. Obtaining these materials will require an introduction the library resources at UMW. The class will meet with a representative from Simpson Library prior to the project being assigned in order to learn how to access UMW's library resources.** Check the tentative schedule for Writing/Speaking center meetings and the Library tour. Helpful guidelines for assessment writing and grading rubrics are given below.

-----Week 7: Each student will chose **a research topic** from the list and notifies the instructor of his / her choice by the end of week seven. Students may choose different topics not listed in the list; however, the topic will need to get the instructor's approval.

-----Week 10: An outline of the paper will be collected by the end of week 10.

-----Week 14: First draft of the paper will be due. In-class editing & revision workshop will be conducted.

-----Week 16: Final paper is due during the final exam week.

**Format:** Double Space; Size: 12; font: times new roman

**Work cited:** Author #1 et al., Name of the Journal, Volume, Page number, Year.

**Content:** You should address the following questions:

- 1) Title: What have you read?
- 2) Introduction:
  - a. What topic are you reviewing?
  - b. Which paper? Where is it published?
  - c. Can you provide a history of the topic?
- 3) Body:
  - a. How does it connect to the material covered in class?
  - b. Why is it important?
  - c. Pictures? Plots? Graphs? Equations?
- 4) Conclusion:
  - a. What have you learned?
  - b. What are the consequences of the findings in the paper?
  - c. What can you contribute to the information presented in the paper?
- 5) Credits: work cited?

**Speaking:** There will also be a 15 minutes professional group presentation of the assessment during week 14 and week 15. Prior to submitted final papers, groups will participate in an editing and revision workshop in class to help hone those skills. The presentation is a brief report of the topic. The idea is to convey all-inclusive essential information about the topic without bias in two pages. An assessment will include the following items:

- 1) Name of Topic
- 2) Reasoning
- 3) A Brief History
- 4) Current Data and Trends
- 5) Assess Pros and Cons
- 6) Analysis and Recommendations

The instructor will use the following rubric to evaluate student assessments. A successful assessment must include the six items listed above as well as a superior command of the tools of language. It exhibits some or all of the following characters:

- a) include the six items listed above
- b) appropriate to the audience
- c) single, distinct focus
- d) generally well-developed ideas or narrative
- e) logical flow of ideas or events
- f) opening that draws in reader; effective closing
- g) sense of completeness
- h) each main idea supported by details; narrative brought to life by details
- i) choice of details effective
- j) precise, interesting, and vivid word choice
- k) sophisticated and consistent command of Standard English
- l) precise syntax and spelling
- m) references

## Grades:

Distribution of Maximum Possible Points	
Quizzes	4 @ 100pnts = <b>400</b>
Homework	<b>100</b>
In class discussions	<b>100</b>
Presentations	<b>200</b>
Final Paper	<b>200</b>
TOTAL	<b>1000</b>

## Final grades will be determined as:

A	A-	B+	B	B-	C+	C	D	F
930-1000	900-929	870-899	830-869	800-829	770-799	700-769	600-699	Below 600

## Dr. Maia Schedule☺:

	Monday	Tuesday	Wednesday	Thursday	Friday
<b>7:00</b>					
<b>8:00</b>					
<b>9:00</b>	<b>Math Methods Jepson 417</b>	<b>Univ.Phys. Lab Jepson 217</b>	<b>Math Methods Jepson 417</b>	Class prep	<b>Math Methods Jepson 417</b>
<b>10:00</b>	<b>Univ.Physics Jepson 219</b>		<b>Univ.Physics Jepson 219</b>	Class prep	<b>Univ.Physics Jepson 219</b>
<b>11:00</b>					
<b>12:00</b>	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH
<b>1:00</b>					
<b>2:00</b>	Research	<b>FSEM HCC 327</b>		<b>FSEM HCC 327</b>	
<b>3:15</b>	Research				
<b>4:00</b>	Research	Research	Research	Research	
<b>5:00</b>	Research	Research	Research	Research	

## Tentative Course Schedule:

Week		#	Date	Discussion Topics	Reminders
1	T	1	8/29	Energy and Power	
	R	2	8/31	Alternative Power Sources	
2	T	3	9/5	<b>Tour in Library</b>	
	R	4	9/7	<b>Writing Center Meeting??</b>	
3	T	5	9/12	Atoms and Heat	
	R	6	9/14	Heat Engines	
4	T	7	9/19	Gravity, Satellites	
	R	8	9/21	----	<b>Quiz1</b>
5	T	9	9/26	Nuclear Radioactivity X-rays	
	R	10	9/28	Fission, Fusion, Cancer, Chain Reactions	
6	T	11	10/3	Nuclear Reactors, Atomic Bombs	
	R	12	10/5	----	<b>Quiz2</b>
7	T	13	10/10	Electricity	Choose final paper topic
	R	14	10/12	<b>Academics Services Meeting</b>	
8	T		10/17	-----	Fall Break
	R	15	10/19	Magnetism	
9	T	16	10/24	Waves, UFOs and Earthquakes	
	R	17	10/26	Light, Mirages, Rainbows, 3D, Holograms	
10	T	18	10/31	Invisible Light, Ozone Layer	Final paper outline due
	R	19	11/2	----	<b>Quiz3</b>
11	T	20	11/7	<b>Speaking Center Meeting??</b>	
	R	21	11/9	Medical Imaging, Ultrasound	
12	T	22	11/14	Climate Change, Global Warming	
	R	23	11/16	The Universe, Galaxies	<b>Quiz4/modules</b>
13	T		11/21	-----	Thanksgiving
	R		11/23	-----	
14	T	24	11/28	Presentations	
	R	25	11/30	Presentations	
15	T	26	12/5	Presentations	
	R	27	12/7	Presentations	
16	T		11/12		<b>Final Paper Due</b>