

SCIN234 16

STUDENT WARNING: This course syllabus is from a previous semester archive and serves only as a preparatory reference. Please use this syllabus as a reference only until the professor opens the classroom and you have access to the updated course syllabus. Please do NOT purchase any books or start any work based on this syllabus; this syllabus may NOT be the one that your individual instructor uses for a course that has not yet started. If you need to verify course textbooks, please refer to the online course description through your student portal. This syllabus is proprietary material of APUS.

Course Summary

Description

Course Description: This fundamental physics course is the second of two courses that examine basic physics using Calculus techniques. The course covers Electric Forces and Fields, Electric Currents and Circuits, Magnetic Forces and Fields, Electromagnetic Induction, Alternating Current, Electromagnetic Waves, Reflection and Refraction of Light, Optical Instruments, Interference and Diffraction, and an Introduction to Quantum and Particle Physics. (Prerequisites: SCIN233 and MATH226)

Course Scope:

This Calculus based course is designed to provide students with an overview of Physics. A survey course, students will learn to apply classic electromagnetism principles to the fundamental topics of electricity and magnetism. Basic Modern Physics is introduced.

Objectives

The successful student will fulfill the following objectives:

- CO-1** Describe the electric field using vectors and scalars.
- CO-2** Solve direct-current circuits.
- CO-3** Describe the magnetic field using vectors and scalars.
- CO-4.** Explain the basic principle of the electric generator.
- CO-5** Understand the differences between E-M and mechanical waves.

CO-6 Explain the dual nature of light.

CO-7 Summarize the concepts of the Special Relativity.

CO-8 Explain the basic principles of Quantum Physics.

CO-9 Illustrate the successive models of the atom from the planetary model to the quantum mechanical model.

Outline

Week 1: Electric fields (Vector approach)

Learning Objectives

CO-1

Readings

Chapter 23

Electric fields

Chapter 24

Gauss's Law

Assignments

Forum W1(due Wednesday by 11:55 pm EST)

Assignment W1

Week 2: Electric fields (Scalar approach)

Learning Objectives

CO-1

Readings

Chapter 25

Electric Potential

Chapter 26

Capacitance and Dielectrics

Assignments

Forum W2

Assignment W2

Lab 1

Week 3: Electricity

Learning Objectives

CO-2

Readings

Chapter 27

Current and Resistance

Chapter 28

Direct-current circuits.

Assignments

Forum W3

Assignment W3

Week 4: Magnetism

Learning Objectives

CO-3

Readings

Chapter 29

Magnetic fields

Chapter 30

Sources of Magnetic fields

Assignments

Forum W4

Assignment W4

Lab 2

Quiz 1

Week 5: Faraday's Law

Learning Objectives

CO-4

Readings

Chapter 31

Faraday's Law

Assignments

Forum W5

Assignment W5

Week 6: Inductance

Learning Objectives

CO-4

Readings

Chapter 32

Inductance

Assignments

Forum W6

Assignment W6

Lab 3

Week 7: Alternating-current circuits

Learning Objectives

CO-4

Readings

Chapter 33

Alternating-current circuits

Assignments

Forum W7

Assignment W7

Week 8: Electromagnetic waves

Learning Objectives

CO-5

Readings

Chapter 34

Electromagnetic waves

Assignments

Forum W8

Assignment W8

Lab 4

Week 9: Electricity and Magnetism Review

Learning Objectives

From CO-1 to CO-5

Readings

Chapters 23 to 34

Assignments

Midterm Exam

Week 10: Principles of Ray Optics

Learning Objectives

CO-6

Readings

Chapter 35

The Nature of Light and the Principles of Ray Optics

Chapter 36

Image Formation

Assignments

Forum W10

Assignment W10

Week 11: Wave Optics

Learning Objectives

CO-6

Readings

Chapter 37

Wave Optics

Assignments

Forum W11

Assignment W11

Lab 5

Week 12: Diffraction and Polarization

Learning Objectives

CO-6

Readings

Chapter 38

Diffraction Patterns and Polarization

Assignments

Forum W12

Assignment W12

Week 13: Relativity

Learning Objectives

CO-7

Readings

Chapter 39

Relativity

Assignments

Forum W13

Assignment W13

Lab 6

Quiz 2

Week 14: Quantum Physics

Learning Objectives

CO-8

Readings

Chapter 40

Introduction to Quantum Physics

Assignments

Forum W14

Assignment W14

Week 15: Atomic and Nuclear Physics

Learning Objectives

CO-9

Readings

Chapter 42

Atomic Physics

Chapter 44

Nuclear Structure

Assignments

Forum W15

Assignment W15

Lab 7

Week 16: Review

Learning Objectives

From **CO-1** to **CO-9**

Readings

From Chapter 23 to Chapter 44

Assignments

Final debate W16

Final Exam

Evaluation

Forums

Participation is mandatory and will count towards the course grade. You are expected to provide a substantial comment of several well-written paragraphs in each session and a similar comment or reflection in reply to at least two other students' contribution. Statements such as "I agree" or "good post" will not count as a reply.

Quizzes and Exams

The quizzes and exams are on-line, open-book, and timed. They may include multiple choices, fill in the blank, and short essay type questions. An announcement will be posted when they are available to be taken.

Lab Reports

Each exercise is designed to have every student apply principles learned during that week. Most of them are "virtual labs" but hands-on experiments may be included.

Please see the [Student Handbook](#) to reference the University's [grading scale](#).

Grading:

Name	Grade %
Forums	15.00 %

Forum W1	0.94 %
Forum W2	0.94 %
Forum W3	0.94 %
Forum W4	0.94 %
Forum W5	0.94 %
Forum W6	0.94 %
Forum W7	0.94 %
Forum W8	0.94 %
Forum W9	0.94 %
Forum W10	0.94 %
Forum W11	0.94 %
Forum W12	0.94 %
Forum W13	0.94 %
Forum W14	0.94 %
Forum W15	0.94 %
Final Debate	0.94 %
Labs	14.00 %
Week 2 - Lab 1	2.00 %
Week 4 - Lab 2	2.00 %
Week 6 - Lab 3	2.00 %
Week 8 - Lab 4	2.00 %
Week 11 - Lab 5	2.00 %
Week 13 - Lab 6	2.00 %
Week 15 - Lab 7	2.00 %
Exams	40.00 %
Midterm Exam 234	20.00 %
Final Exam	20.00 %
Assignments	21.00 %
Week 1 - Assignment W1	1.50 %
Week 2 - Assignment W2	1.50 %
Week 3 - Assignment W3	1.50 %
Week 4 Assignment W4	1.50 %
Week 5 Assignment W5	1.50 %
Week 6 - Assignment W6	1.50 %
Week 7 - Assignment W7	1.50 %
Week 8 - Assignment W8	1.50 %
Week 10 - Assignment W10	1.50 %
Week 11 - Assignment W11	1.50 %
Week 12 - Assignment W12	1.50 %
Week 13 - Assignment W13	1.50 %
Week 14 - Assignment W14	1.50 %
Week 15 - Assignment W15	1.50 %
Quizzes	10.00 %
Quiz 1	5.00 %
Quiz 2	5.00 %

Materials

Book Title: Physics for Scientists and Engineers, 8th Ed, Volume 2, Chapters 23-46 - The VitalSource e-book is provided via the APUS Bookstore; hard copy not available from the APUS Bookstore, please try other sources.

Author: Serway

Publication Info: Cengage

ISBN: 9781439048399

Book Title: You must validate your cart to get access to your VitalSource e-book(s) and hard copy book(s). If needed, instructions are available here - <http://apus.libguides.com/bookstore/undergraduate>

Author: N/A

Publication Info: N/A

ISBN: N/A

Required Technology

- See the Technology Requirements section of the undergraduate catalog for the minimum hardware and software requirements.
 - Microsoft Office 365 is available to APUS students for free. To sign up, visit <http://products.office.com/en-us/student>. If you have questions about accessing the software, please contact Classroom support at classroomsupport@apus.edu.
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Course Guidelines

Citation and Reference Style

- Attention Please: Students will follow the APA Format as the sole citation and reference style used in written work submitted as part of coursework to the University. Assignments completed in a narrative essay or composition format must follow the citation style cited in the APA Format.

Tutoring

- [Tutor.com](https://www.tutor.com) offers online homework help and learning resources by connecting students to certified tutors for one-on-one help. AMU and APU students are eligible for 10 free hours* of tutoring provided by APUS. Tutors are available 24/7 unless otherwise noted. Tutor.com also has a SkillCenter Resource Library offering educational resources, worksheets, videos, websites and career help. Accessing these resources does not count against tutoring hours and is also available 24/7. Please visit the APUS Library and search for 'Tutor' to create an account.

Late Assignments

- Students are expected to submit classroom assignments by the posted due date and to complete the course according to the published class schedule. The due date for each assignment is listed under each Assignment.
- Generally speaking, late work may result in a deduction up to 15% of the grade for each day late, not to exceed 5 days.
- As a working adult I know your time is limited and often out of your control. Faculty may be more flexible if they know ahead of time of any potential late assignments.

Turn It In

- Faculty may require assignments be submitted to Turnitin.com. Turnitin.com will analyze a paper and report instances of potential plagiarism for the student to edit before submitting it for a grade. In some

cases professors may require students to use Turnitin.com. This is automatically processed through the Assignments area of the course.

Academic Dishonesty

- Academic Dishonesty incorporates more than plagiarism, which is using the work of others without citation. Academic dishonesty includes any use of content purchased or retrieved from web services such as CourseHero.com. Additionally, allowing your work to be placed on such web services is academic dishonesty, as it is enabling the dishonesty of others. The copy and pasting of content from any web page, without citation as a direct quote, is academic dishonesty. When in doubt, do not copy/paste, and always cite.

Submission Guidelines

- Some assignments may have very specific requirements for formatting (such as font, margins, etc) and submission file type (such as .docx, .pdf, etc) See the assignment instructions for details. In general, standard file types such as those associated with Microsoft Office are preferred, unless otherwise specified.

Disclaimer Statement

- Course content may vary from the outline to meet the needs of this particular group.

Communicating on the Forum

- Forums are the heart of the interaction in this course. The more engaged and lively the exchanges, the more interesting and fun the course will be. Only substantive comments will receive credit. Although there is a final posting time after which the instructor will grade comments, it is not sufficient to wait until the last day to contribute your comments/questions on the forum. The purpose of the forums is to actively participate in an on-going discussion about the assigned content.
- “Substantive” means comments that contribute something new and hopefully important to the discussion. Thus a message that simply says “I agree” is not substantive. A substantive comment contributes a new idea or perspective, a good follow-up question to a point made, offers a response to a question, provides an example or illustration of a key point, points out an inconsistency in an argument, etc.
- As a class, if we run into conflicting view points, we must respect each individual's own opinion. Hateful and hurtful comments towards other individuals, students, groups, peoples, and/or societies will not be tolerated.

University Policies

[Student Handbook](#)

- [Drop/Withdrawal policy](#)
- [Extension Requests](#)
- [Academic Probation](#)
- [Appeals](#)
- [Disability Accommodations](#)

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