

# Introductory Physics

Yearlong Course

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## STUDENTS OF INTRODUCTORY PHYSICS

9-11<sup>th</sup> Graders will develop and solidify their understanding of Introductory Physics. Students should be enrolled or concurrent in Algebra I to use this book, which is the standard track mathematics for 9th grade. “We make our exercises challenging, requiring students to utilize multiple concepts and skills to arrive at an answer, but nothing higher than basic algebra is required for this text” (J.D. Mays, 2014). Students must be able to read the text, take notes, memorize vocabulary, and express themselves through essay questions and written laboratory reports. They must have the maturity to study regularly and keep pace with the course.

Students enrolled in this course will complete both virtual and at home quantitative laboratory experiments along with written reports that adhere to a specific rubric for scientific writing. A parent is expected to oversee at home experiments to assure safety and adherence to the laboratory protocols. The laboratory supplies and equipment need to be collected prior to conducting the experiments at home. The student completing this course earns one high school course credit.

## SCHEDULE FOR INTRODUCTORY PHYSICS

Course starts **Wednesday, September 5, 2023**, and will end **Friday, May 24, 2024**

|                           |                            |                     |
|---------------------------|----------------------------|---------------------|
| Section TBD               | Monday, Wednesday, Friday* | 11:00 - 12:15 am CT |
| Section TBD               | Monday, Wednesday, Friday* | 2:00 - 3:15 pm CT   |
| 95 sessions (in 32 Weeks) |                            |                     |

### **Important Dates:**

- September 19, 2023: last day to add/drop
- October 27, 2023: last day of Quarter 1 (closing of Q1 progress report)
- November 20 – 24, 2023: Thanksgiving holiday (no classes)
- December 15, 2023 – January 8, 2024: Christmas and New Year’s holidays (no classes)
- January 19, 2024: last day of fall semester and Quarter 2 (closing of Q2 progress report)
- February 19 – Friday, February 23, 2024: winter break (no classes)
- March 22, 2024: last day of Quarter 3 (closing of Q3 progress report)
- Monday, March 25 – Friday, March 29, 2024: Holy Week/Easter holiday (no classes)

**OFFICE HOURS:** Tuesday and Thursday mornings\* by appointment.

\*These are anticipated dates for this course. However, they are subject to change as circumstances might dictate. Session(s) canceled will be rescheduled at an alternate time.

## **CONTENT MAP FOR INTRODUCTORY PHYSICS**

First Quarter (September 5<sup>th</sup> - October 28<sup>th</sup>)

Chapter 1. The Nature of Scientific Knowledge

Chapter 2. Motion

Chapter 3. Newton's Laws of Motion

Second Quarter (October 31<sup>st</sup> - January 19<sup>th</sup>)

Chapter 4. Energy

Chapter 5. Momentum

Chapter 6. Atoms, Matter, and Substances

Third Quarter (January 23<sup>rd</sup> – March 23<sup>rd</sup>)

Chapter 7. Heat and Temperature

Chapter 8. Pressure and Buoyancy

Chapter 9. Waves, Sound, and Light

Fourth Quarter (March 27<sup>th</sup> – May 25<sup>th</sup>)

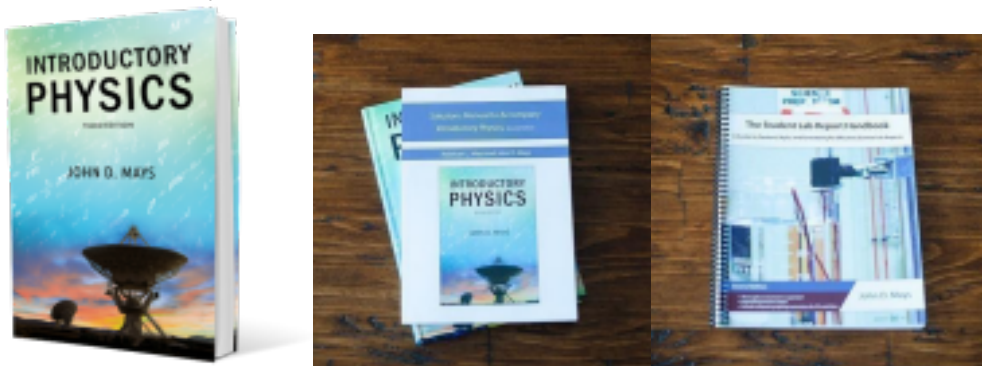
Chapter 10. Introduction to Electricity

Chapter 11. DC Circuits

Chapter 12. Field and Magnetism

Chapter 13. Geometric Optics

REQUIRED MATERIALS FOR INTRODUCTORY PHYSICS: Textbook, Solutions Manual (**not** the complete version), Lab Report Handbook. [Classical Academic Press](#)



A list of Lab materials will be provided two to three weeks before each lab.

Bound composition style Lab Journal with grid paper,

Scientific Calculator

Binder with 2 x 2 graph paper and notebook paper.

Microsoft Word, PowerPoint, and Excel (or equivalent software).

Ability to create PDF files for submitting coursework is required.

Printer with scanner (ability to print worksheets and scan homework)

It is strongly recommended that students obtain a tablet and stylus pen to enable them to participate in a neat and quick way when participating in class exercises

## **COURSE DESCRIPTION FOR INTRODUCTORY PHYSICS**

Preparedness: Introductory Physics is for freshmen, sophomores, or juniors who have taken (or are concurrently taking) Algebra I. The course utilizes algebraic manipulations of equations, unit conversions, and significant figures. Students are also expected to read the text, take notes, and write in full sentences.

Content: Twelve modules of the course text, Introductory Physics by John D. Mays, 3<sup>rd</sup> Ed., will be used to cover: Scientific knowledge; Motion; Newton's laws of motion; Energy, Momentum; Atoms, matter, and substances; Heat and temperature; Pressure and buoyancy, Waves, Sound, and Light; Electricity; DC circuits; and fields and magnetism and optics if time allows.

Mastery: To prepare students for upper-level high school Science/Natural Philosophy Courses, this course uses a mastery approach. This is achieved by covering fewer concepts at a deeper level. Our goal is to have a solid, working comprehension of these concepts and to apply the mathematical calculations accompanying them. Mastering these concepts now will create a foundation upon which higher level concepts can be built in Biology, Chemistry, and College Preparatory Physics. Regular review of important "standard problems" throughout the year will keep concepts relevant and fresh. Students will be expected to keep up with the daily workload of reading the text, taking notes, attending class, completing the practice problems, as well as reviewing older material.

Integration: This course approaches Physics holistically, integrating history, mathematics, English language, and epistemology.

Laboratory: A good observer understands that well-designed experimentation, proper interpretation of results, and precise communication of findings is part of repeatability. Quantitative Laboratory Experiments will be conducted during the course using Novare guidelines for lab reports in *The Student Lab Report Handbook* (part of the Introductory Physics Program by John D. Mays). Lab supplies and equipment can be purchased locally or online at Amazon, and *Home Science Tools* (note: the Lab Kit for Novare provided by *Home Science Tools* is not necessary as items may be substituted with materials recommended by Mrs. Joslin). A list of materials will be provided two to three weeks before each lab. Parents are expected to oversee home laboratory exercises to ensure the safety of students and the following of proper procedure. Together they will pre-read the exercise and set up supplies and equipment prior to their Lab Time.

Grading: The course grade is based on cumulative assessments, completion of homework, and written laboratory reports. Self-checking, and regular review of past material is expected and will ensure mastery. Missed work and late submissions will be conditionally accepted.

### **PARENT EXPECTATIONS IN ACTION**

The expectations of parents are that they will ensure that their student has all required materials needed for the course, a stable internet connection, a distraction-free environment for class sessions, and adequate time to study and complete assigned work outside of class sessions. Parent assistance with assignments is not expected nor required. If your student is struggling with an assignment and asks for help, it is encouraged for parents to provide help. It is also strongly encouraged for students to reach out to Mrs. Joslin, either in class or via email for help or clarification.

### **STUDENT EXPECTATIONS - EXECUTIVE FUNCTION SKILLS**

In this class, students will be expected to show development of Executive Function Skills throughout the year. Executive Function Skills are qualities and skill sets that students can develop and hone to better approach the courses, lectures, readings, and teachers they will encounter in their journey as a student. Students in this class should exhibit the following Executive Function Skills throughout the year:

Engagement: The student views class sessions as opportunities to learn and be in fellowship with the instructor and classmates. He is polite and attentive during class sessions, listens actively when others are speaking, and supplies answers, asks questions, and participates in class discussions. The student keeps his video on and stays focused on viewing the Zoom screen (not distracted by other screens).

Self-Control: The student raises his hand during class, speaks when called on to do so (and not out of turn), remains on-task, and shares relevant questions, comments, and ideas. He resists temptations to view other screens or use other devices, play games, work on other schoolwork or activities, or distract the instructor and classmates with disruptive behaviors.

Responsibility: The student completes and submits all assignments by the due date, arrives on time to all class sessions, regularly checks Canvas for class information and updates, communicates with the instructor promptly with questions and requests for help, and makes use of offered resources. As the student grows in responsibility, our goal would be that he is able to learn and complete assigned work with independence.

Initiative: The student thinks about his own learning and discerns whether he understands the lesson or topic. He receives instructor feedback humbly and applies it to future assignments. The student actively communicates with the instructor (and/or parents) to seek help and ask questions if necessary. He strives to take ownership of his own learning. Additionally, students will also practice the important skill of taking notes, which may or may not have been expected of them in past classes or lessons. Students will learn to discern important information, vocabulary, and example problems to write down for future review and study. And will be encouraged to finish his notes after a lesson and to write down his own thoughts and questions for later class sessions, independent study, or meetings with the instructor. This skill set will be expected in higher-level courses.

### **STUDENT EXPECTATIONS IN ACTION**

The instructor will facilitate learning and will provide opportunities for practice and growth in our topics of study. It is ultimately the student's responsibility to be an active learner both in and out of the class sessions. The student must stay up to date with assignments and take initiative to ask the instructor and/or parents for help when it is needed. The student is expected to:

- Arrive on time to class sessions with required materials.
- Attend the entire class with his video on.
- Listen attentively and participate actively in class sessions. – including presenting problems, sharing methods or strategies for solving problems, reviewing answers, posing questions, explaining, and justifying answers, and thinking out loud.
- Embrace mistakes as opportunities to learn.
- Seek approved help if struggling with lessons or assignments.
- Complete and submit all assignments by the due date.
- Students will submit their work by scanning their assignment pages to PDF and uploading them to Canvas. Photographs of completed assignments will generally NOT be accepted as they are incredibly difficult to read.

### **STUDENT EVALUATION**

Students work alongside the instructor as they learn and grow in their understanding of Introductory Physics, and grades allow the instructor to communicate in a consistent manner with students about their level of mastery. Grades give a reflection of students' level of mastery. The Mastery Grade Scale is as follows:

- Master: a student whose work shows mastery of the material. This grade is comparable to

achieving a 90% or above and is a letter A.

- Journeyman: a student whose work shows that he is approaching mastery of the material will earn a grade comparable to 80-89% or a letter B.

- Apprentice: a student who needs to spend more time studying and learning the content will earn a grade comparable to 79% or below. Students in this range will be encouraged to re-work the assignment and may be provided with additional practice or tutoring if needed.

## **TYPES AND WEIGHTS OF ASSIGNMENTS**

Mrs. Joslin will maintain a record of grades within the Canvas Learning Management System. A student's grades will be comprised of:

1. Assessments, Projects, Quizzes: 60% of grade.
2. Homework Completion: 20% of grade.
3. Written Laboratory Reports: 10% of grade.
4. Participation: Classwork 10%

All assignments are due on Canvas by the start of class on the due date unless otherwise specified. If there are extenuating circumstances that prevent a student from completing a homework assignment, Mrs. Joslin should be notified by email (prior to class time if possible) to ask for an extension. Students and parents should understand that normally assignments turned in late will earn a 10% penalty. Assignments turned in more than one week past the assigned due date normally would not be awarded credit, nor would they be corrected.

## **ACADEMIC DISHONESTY**

Students will often complete assessment tests and/or quizzes privately at home. Students are on their honor to abide by Scholé Academy's Learning Philosophy which assumes the personal cultivation of Student Virtues described in the Student-Parent Handbook. Unless otherwise noted, all assignments are to be completed without the use of outside materials. Additionally, plagiarism and the use of homework websites/apps is a serious and punishable offense. Any assignment found to be completed dishonestly will result in a failing grade.

## **THE VIRTUAL CLASSROOM**

We will be using the free online "virtual classroom" software provided by Zoom, one of the leading companies that provides such software. The virtual classroom will provide students with interactive audio, and an interactive whiteboard in which texts, diagrams, video, and other media can be displayed and analyzed. We will provide students with a link (to be sent via email and posted on Canvas that will enable students to join the virtual classroom. Canvas will be used to convey course information and assignments, to communicate with the instructor, and upload and submit assignments. Students will use scanning technology/apps (like ClearScan) to create single-file PDFs of completed assignments to submit through Schoology.

Finally, we will be using digital tablets (like Wacom, iPad, or Chrome tablets) to allow students to write and draw (with a stylus pen) in response to class activities/problems and share these responses with their instructor and classmates. Students should have a digital tablet during class sessions to participate actively and fully in the lessons. Specific information regarding the technology used by Scholé Academy (including required technology) can be found by visiting the Technology in the Classroom section of the Student Parent Handbook.