

***INQ 250 PH: Take a Dive – How Things Work
Syllabus – Fall 2022***

Location: Trexler 274

Instructor: Dr. Daniel Hickox-Young

Office Hours: MW 2:30-4:00PM

Or use Calendly to schedule

(<https://calendly.com/hickoxyoung>)

Time: MWF 12:00-2:10PM

E-mail: hickoxyoung@roanoke.edu

Phone: (540) 375-4975

Office: Trexler 266A

Also available via Zoom as needed

Masks: The College does not currently have a mask mandate in place, and I will not be requiring masks in our classroom. However, COVID-19 transmission rates remain high in our community, and anyone is welcome to wear a mask if they choose. You may see me wearing a mask, depending on local transmission rates and whether I've been traveling or under the weather recently.

Office Hours: You are always welcome to stop by my office. Talking about physics with students is one of my favorite things. You are guaranteed to find me in my office during office hours (unless otherwise announced). If you'd like to make sure I'm available outside of office hours, you can schedule an appointment with Calendly (<https://calendly.com/hickoxyoung>). I am happy to meet in my office (Trexler 266B) or via the Zoom link below, as you prefer. If you need to meet outside of traditional business hours (i.e. after 5pm) send me an email and we can find a time to meet via Zoom. <https://roanoke-edu.zoom.us/my/hickoxyoung> Meeting ID: 848 844 3643 No Passcode is required.

Optional course textbook: Jackson, Laws, and Franklin; *Explorations in Physics*, Wiley & Sons, Inc.; 2003

Prerequisites: None

Other required materials: A bound lab notebook and graph paper pages to use in lab, a calculator, and Lunsford's *Easy Writer*.

Course Restrictions: If you have received credit for other higher-level physics courses at Roanoke College, you cannot receive credit for this course.

Course Description: This scientific reasoning course is based on the theme of sky diving and deep sea diving, designed to address the fundamental questions "why study motion and what factors contribute to the motion of an object?". The basic laws of physics applicable to motion will be investigated through experimentation.

Learning Outcomes: All INQ 250 sections share the following set of learning outcomes:

- Students will be able to describe and apply scientific methodologies appropriate for the course's discipline and topic, including the ability to design and conduct simple experiments and to draw conclusions based upon data.

- Students will be able to write about course topics clearly and effectively.
- Students will be able to interpret quantitative information related to the course topic.

Upon the completion of this particular section of INQ250, students will be able to:

- operate computer-interface sensors and lab equipment
- make measurements and collect data
- analyze and interpret graphical data
- communicate their scientific findings through reports, class discussions, and oral presentations
- understand how a scientific theory relating forces and motion can be developed from experimental observations
- use the scientific method to devise their own experiments to test the validity of hypotheses

Lecture Periods: Class time will typically start with a brief lecture and primarily spent on performing experiments, computer-based activities, discussions, exploratory worksheets, and cooperative learning group activities.

Attendance: Attendance will be formally taken at the beginning of class and will count towards your final grade. Due to the nature of this course, students are expected to attend every class. The maximum number of absences is three for the whole semester. A fourth absence, for any reason, may result in a DF from the course. If the student is not dropped in this case, their final grade will be lowered by one letter grade. You are fully responsible for the material that was covered and for any announcements made in class, such as changes to the schedule and/or syllabus.

Participation: You are expected to come to class prepared and fully participate by bringing the required materials to class, abstaining from using electronic devices for any personal issues and talking to other students about matters not concerning the lab at hand. The following table summarizes the guidelines for grading “participation” for each class.

10 points	If the student brings ALL required materials, is fully involved with class, completes the daily work
-2 points	For every 5 min late
-2 points	Using the phone multiple times
-2 points	Coming to class unprepared
-4 points	Not fully involved with the group/ Not participating
0 points	If the student does NOT bring ANY of the required materials, is not focused on completing the lab, uses electronic devices for personal reasons

Lab Notebook: You are required to bring a bound notebook with graph paper pages to lab each meeting. The lab notebook must be organized and present full reports of the work completed. Each new lab will begin on the right hand page with the **lab title, lab partners’ names, and date of the experiment.** You should:

- 1) answer each question with complete sentences (A simple “No” or “Yes” is not enough, I want to know *why* the answer is Yes or No)

- 2) report all your data neatly presented in table format
- 3) write down your results in table format with a sample calculation for each result category
- 4) provide error analysis of your results

Graphs obtained during class should be printed in lab and pasted of one page of the notebook.

Pay special attention to units: appropriate units must be included in all table columns and graphs.

Each notebook will be checked before students leave for the day, and it will be graded as follows:

10 points	If all the requirements mentioned here are followed, notebook entries are organized and thorough
5 points	If the requirements mentioned here are not fully followed- such as not presenting all required entries, missing units, data and/or results are not organized
0 points	If the student did not bring lab notebook, did not record data/results into notebook, fails to submit notebook before leaving lab

When absent from class, you can still get full credit for your lab notebook by copying over the results from a classmate who was present for lab. Be sure to contact me if you are absent so that your notebook can still be checked.

Homework: Problem sets will be regularly assigned to unify the concepts learned in class and give you an opportunity to work out detailed theoretical problems for concepts you witnessed in labs. Assignments are due at the beginning of class on the due date. **No late submissions will be allowed unless an extension is discussed and granted beforehand (with exceptions for emergencies).**

Exams: There will be two unit exams and a fully comprehensive final exam, with their dates specified in the course schedule. Unit exam make-ups for excused reasons (family or medical emergencies, and university-recognized commitments) must be discussed and arranged with me at least two weeks in advance, unless it is an emergency. If your missed exam is unexcused, you will receive a zero on that exam.

Projects: You will participate in two group projects this semester to highlight each of the units. Each student is expected to fully participate and share the work equally with their group members. More information about these projects will be provided closer to the start date of each project.

Grading: Class grades will be calculated according to the following distribution

- ✦ Participation/ Lab Work 10%
- ✦ Lab Notebook 10%
- ✦ Homework 15%
- ✦ Unit Exams 12% each
- ✦ Unit A Project 15%
- ✦ Unit D Project 10%
- ✦ Final Exam 16%

Furthermore, letter grades will be assigned at the end of the semester according to the following scale

A-	90-92	A	93-100			
B-	80-82	B	83- 86	B+	87-89	
C-	70-72	C	73- 76	C+	77-79	
D-	60-62	D	63- 66	D+	67-69	F <60

Rounding UP (never down) final course grades may take into consideration the instructor's evaluation of the student's effort, improvement, integrity, and conduct.

You should expect to spend at least 12 hours inside and outside of class each week on this course.

Extra Credit/ MCSP Conversation Series: Extra credit is available for students who attend ONE talk in the MCSP Conversation Series (schedule available at <http://cs.roanoke.edu/MCSPSeries>) and submit a well-written reflection on the talk within one week of the presentation. The submission must present a brief summary of the key ideas of the talk and include a description of the parts of the presentation that were interesting, confusing, and relevant to this course. Your work must be grammatically-correct, typed, double-spaced, and between one and two pages in length. The submitted paper will earn 0, 0.5, or 1 percent to be added to the final grade. Note that a simple summary of the talk is not sufficient to receive credit.

Inquire: Inquire will give you access to the syllabus, homework assignments, lab instructions and handouts, supplemental readings, and announcements. Check the Inquire website regularly and read the relevant handout before coming to class to be prepared for the daily exercise!

Use of Electronic Devices: Computers in the lab are networked and you are required to log onto them using your username and password. **Do not save any work to the desktop**, because it will be erased when logging off the computer at the end of class. Save all your work to your Z drive. Printing graphs will be necessary throughout the semester for lab notebooks, and the printers in the lab are to be used for that purpose only (not documents for other courses or personal reasons).

You are allowed to use cameras for the group projects and personal laptops/tablets for the purpose of taking notes. Scientific calculators can also be used during class if needed and during exams. Your phones must be on silent mode and out of reach during class and must be turned off during exams. Violations of this policy during exams can constitute a violation of the academic integrity policy.

Disability Support: Accessible Education Services (AES) is located in the Goode-Pasfield Center for Learning and Teaching in Fintel Library. AES provides reasonable accommodations to students with documented disabilities. To register for services, students must self-identify to AES, complete the registration process, and provide current documentation of a disability along with recommendations from the qualified specialist. Please contact Laura Leonard, Assistant Director of Academic Services for Accessible Education, at 540-375-2247 or by e-mail at aes@roanoke.edu to schedule an appointment. If you have registered with AES in the past and

would like to receive academic accommodations for this semester, please contact Laura Leonard at your earliest convenience to schedule an appointment.

Academic Integrity: The Academic Integrity (AI) policy at Roanoke College will be thoroughly followed in this course, and I expect you to abide by all the outlined rules to avoid any questionable conduct. General concepts related to assignments may be clarified through conversations with other students, but you should solve the problems on your own. Exams are closed-book, and no discussion among students is allowed after the exam in case a student has not taken the exam. I will explicitly inform you if/when you can start discussing exams with others. You are allowed to use a calculator ONLY to compute numerical quantities. If I become aware of a possible violation of these guidelines, I am obligated to report it to the Academic Integrity committee. Student resources on the AI policy can be found online at: https://www.roanoke.edu/inside/a-z_index/academic_affairs/academic_integrity/resources_for_students

Class Environment: I consider this classroom to be a place where we will treat one another with respect, creating an environment that welcomes individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, ability – and other visible and nonvisible differences. All members of this class are expected to contribute to a respectful, welcoming and inclusive environment for every other member of the class.

I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me early in the semester so that I may make appropriate changes to my records.

INQ 250 PH: Take a Dive – How Things Work, Fall 2022 - Schedule The following schedule outlines the tentative timeline for topics and exam dates:

Dates	Topic
August 31 – September 30	Unit A: Fundamental Concepts Related to Sky Diving
October 3	Unit A Exam
October 5 – October 14	Unit A Projects
October 17 – October 21	Fall Break
October 24 – October 26	Report Writing/Presentation Preparation
October 28	Unit A Project Presentations
October 31 – November 18	Unit D: Fundamental Concepts Related to Deep Sea Diving
November 21	Unit D Exam
November 23-25	Thanksgiving Break
November 28 – December 7	Unit D Projects
December 9	Unit D Project Presentations /Review for Final Exam

Friday, December 16

Final Exam: 2:00 PM – 5:00 PM