

INQ 250 PH: Take a Dive – How Things Work Syllabus - Spring 2022

Location: Trexler 274

Instructor: Prof. Dana Hargrove

Office Hours: By Appointment

Time: MWF 9:40-11:50

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Office: Trexler 270J

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:

- become familiar with 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.

The College has issued a mask mandate for the start of the semester that requires masks to be worn in indoor common spaces such as our classroom. You must wear a mask over your nose and mouth in this class. If you arrive without a mask, you will not be allowed to stay and may lose credit for attendance or in-class work. The Bookstore sells masks if you need to make a quick purchase. If the mandate is extended, you will be required to continue to wear a mask.

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, whether excused or not, 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. Students should be on time and they will be marked as absent: a) after two times of being late by 1 to 5 minutes, or b) after one time of being late by 10 minutes or more.

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. While virtual, you will be present with your camera turned on and eyes forward towards the screen. 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	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) write down the questions with the detailed answer following the corresponding question
- 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 on 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 are still responsible for the day's work and you should copy the data/results from lab partners with a full understanding of the lab. You are required to complete work within one class day after your return to class. It is your responsibility to report your absence to me via email prior to the missed class and have your lab notebook checked by me.

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.

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 15% each
- Unit A Project 10%
- Unit D Project 5%
- Final Exam 20%

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 be approximately one page 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.

The Writing Center @ Roanoke College, located on the Lower Level of Fintel Library (Room 15), offers free tutorials focused on writing projects and oral presentations for students working in any field. Writers and presenters at all levels of competence may visit the Writing Center at any point in their process—including brainstorming, drafting, organizing, editing, or polishing presentation skills—to talk with trained peer tutors in informal, one-on-one sessions. The Writing Center is open Sunday through Thursday from 4 to 9 PM. Simply stop in, or schedule an appointment at www.roanoke.edu/writingcenter. Questions? Email writingcenter@roanoke.edu or call 540-375-4949.

Subject Tutoring, located on the lower level of Fintel Library (Room 5), is open 4-9 PM, Sunday-Thursday. Subject Tutors are highly trained, current students who offer free, one-on-one (and small group) tutorials in over 80 courses taught at Roanoke College, including: Business, Economics, Mathematics, INQ 240, Modern Languages, Lab Sciences, and Social Sciences. Check out all available subjects and schedule 30- or 60-minute appointments at

www.roanoke.edu/tutoring. If you have a question, feel free to stop by, or contact us at subject_tutoring@roanoke.edu or 540-375-2590. See you soon!

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 Becky Harman, 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 Becky Harman at your earliest convenience to schedule an appointment and/or obtain your accommodation letter for the current semester.

Student Health & Counseling Services supports students through in-person health appointments, in-person counseling, 24/7 telehealth (TimelyCare), Therapy Assistance Online, as well as resources related to general wellness, LGBTQ+, sexual assault, substance abuse, and suicide prevention. Unmet health needs can negatively impact your performance in this course. Student Health & Counseling Services can help. Please see <https://www.roanoke.edu/shcs> for more information and to access services.

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: Each member of this class is valued, and is expected to 1) treat everyone else with respect and 2) contribute to a welcoming and inclusive environment.

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

Dates	Topic
January 19 – February 18	Unit A: Fundamental Concepts Related to Sky Diving
February 21	Unit A Exam
February 23 – March 4	Unit A Projects
March 7 – March 11	Spring Break- Enjoy!!!!

March 14	Report Writing/Presentation Preparation
March 16	Unit A Project Presentations
March 18 – April 6	Unit D: Fundamental Concepts Related to Deep Sea Diving
April 8	Unit D Exam
April 11 – April 20	Unit D Projects
April 15	Good Friday- No class!
April 22	Unit D Project Presentations
April 25	Review for Final Exam
Thursday, April 28	Final Exam: 8:30 AM – 11:30 AM