Course Web Home Page: We will be using Canvas for online announcements and resources, such as textbook readings and practice exams, please check our Canvas site several times a week to stay up-to-date with course announcements.

Staff: Lecturers: Dr. Charles (Chaz) Ruggieri Tel. 848 445 8464 Email: chazr@physics.rutgers.edu Dr. Geraldine Cochran Tel. 848 445 8757 Email: Geraldine.cochran@rutgers.edu

Workshop Leaders: Caitlin Carpenter Email: carpenter@physics.rutgers.edu Parameshwar Pasnoori Email: pasnoori@physics.rutgers.edu Catie Raney Email: raney@physics.rutgers.edu

Required Materials:

✓ Online Homework system: Available online at WebAssign.net, the course key which will be posted on Canvas is: WebAssign Course Key: rutgers 6938 4015

✓ iClicker Cloud (formerly called iClicker Reef) subscription, available online at: https://www.iclicker.com/pricing. A 6-month subscription is $14.99. Note: you do not need to purchase an iClicker transmitter, just the iClicker Cloud subscription since iClicker Cloud allows students to use smartphones, laptops, and tablets to interact with lecture polls, quizzes, and questions. If you already purchased an iClicker transmitter you will still need to purchase an iClicker Cloud subscription to participate in lecture activities.

✓ SCIENTIFIC calculator (not graphing, not programmable; available at Target, Walmart, Rutgers bookstore, etc., for ~$10). This is the only calculator you need as a practicing engineer. Buy solar, it will last for a very long time. Required, or else you’ll do all calculations on exams by hand.

✓ Three-ring binder, at least 1½”, to keep your course handouts and activities in the binder (there will be a lot).

Recommended Reading Materials:

Physics textbooks are an extremely important resource for conceptual understanding and additional practice with problem solving. Some textbooks are better at explaining some concepts better than others. Some textbooks will provide better (or harder) practice problems, which is great for studying for exams. We encourage you to use multiple resources. Thus, we recommend the following textbooks for this course. The Course Calendar explains which chapters are covered each week.

✓ Physics The First Science by Lindenfeld and White Brahmia (ISBN 978-0-8135-4937-8) available at the Rutgers Bookstore ($72 new). We will post the chapters on Canvas for FREE in pdf form. This textbook can be rented or purchased USED for considerably less than new, for example: http://www.amazon.com/Physics-First-Science-Peter-Lindenfeld/dp/081354937X

This text will walk you through several practice problems and will focus on conceptual understanding.

✓ College Physics by OpenStax, available for free online at: https://openstax.org/details/collection-college-physics

This is a more standard textbook and it is free.

✓ College Physics by Etkina, Gentile, and Van Heuvelen (ISBN 978-0-3217-1535-7) available on Amazon with Prime ($278.16 new hardcover), ($144.41 used hardcover), ($95.38 to rent), ($175.99 e-textbook), (new loose leaf $189.17), used loose leave ($108.89).

This is a more standard textbook, it includes several examples and practice problems. This course follows the philosophy of this textbook both in the workshops and in the lectures.
**Pretesting and Post-testing**

All of the engineering students are being tested in their core courses this fall at the beginning of the semester and again at the end of the semester. These data will be used to improve your learning experiences in these courses and in your future courses.

There is one in-class paper test and one online survey that you must take during the first week of classes as pretests, and again at the end of the semester as post tests. So you will need to complete four tests in all – two at the beginning (one in class, one online) and two at the end of the semester (one in class, one online) in order to receive credit for having taken the tests.

The online survey takes about 20 mins, must be completed by 9/15/2017 11:59 pm and can be accessed at:
https://rutgers.qualtrics.com/jfe/form/SV_79bqinPSg7wdN0p

If you miss the in-class test, you will find make up times posted to Canvas. If you don’t take the tests it will count against you in your course grade, and if you do it will help your course grade – regardless of how well you do on the tests. If you don’t want your data to be included, please see the informed consent available on the online survey and on Canvas regarding your rights to not have your data included in this study.

**Structure of the Course:**

This course follows a weekly cycle that starts on Tuesdays.

- Each activity feeds into the next.
- There are textbook readings to be completed Tuesdays before the first lecture of the cycle.
- You’ll work on the WebAssign Homework and submit it by 1:55pm on Tuesdays, and again by 11:59pm on Thursdays.
- Office hours are available outside of class, in addition to RLC tutoring, to help you with the WebAssign activities.

<table>
<thead>
<tr>
<th>Reading</th>
<th>Tuesday</th>
<th>Workshop</th>
<th>Thursday</th>
<th>Summary Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>(To be completed by 1:55pm on Tuesdays)</td>
<td>Lecture</td>
<td>(Weds/Thurs)</td>
<td>Lecture</td>
<td>(Monday)</td>
</tr>
<tr>
<td>Physics Lecture Hall</td>
<td>NPL 213</td>
<td>NPL 213</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Homework due by 1:55pm</td>
<td>+ Homework due by 11:59pm</td>
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**Lecture**

Coming prepared to lecture is **required** for this course. You are required to purchase an iClicker Cloud subscription in order to participate in lecture (for more information, see “Required Materials” above). Note: iClicker Cloud allows you to participate with smartphones, laptops, and tablets, and iClicker Cloud was previously called “iClicker Reef”, however it refers to the same subscription. The link to purchase an iClicker Cloud subscription is found here: https://www.iclicker.com/pricing

**Workshop Meeting Times:** (NanoPhysics Laboratory 213)

<table>
<thead>
<tr>
<th>Section</th>
<th>Section Meeting times</th>
<th>Instructor</th>
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</thead>
<tbody>
<tr>
<td>R1</td>
<td>M Th 10:20-11:40 AM</td>
<td>Parameshwar Pasnoori</td>
</tr>
<tr>
<td>R2</td>
<td>M Th 12:00-1:20 PM</td>
<td>Parameshwar Pasnoori</td>
</tr>
<tr>
<td>R3</td>
<td>M W 1:40-3:00 PM</td>
<td>Catie Raney</td>
</tr>
<tr>
<td>R4</td>
<td>M W 3:20-4:40 PM</td>
<td>Catie Raney</td>
</tr>
<tr>
<td>R5</td>
<td>M W 5:00-6:20 PM</td>
<td>Caitlin Carpenter</td>
</tr>
<tr>
<td>R6</td>
<td>M W 6:40-8:00 PM</td>
<td>Caitlin Carpenter</td>
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</table>
Workshop:
The Workshop Activity takes place during the recitation that meets either on Wednesday or Thursday (depending on your schedule). There you will work collaboratively and will have an oral quiz at the end of the recitation meeting. In the case of emergency you can make up a missed Workshop the same week during a different recitation, but you must get permission from Dr. Ruggieri or Dr. Cochran BEFORE you can attend a different recitation time. A Workshop cannot be made up after 3rd period on Thursday of the week in which it is assigned, but the lowest score will be dropped when calculating your final grade. In general, at least 30% of the exam questions are based on the Workshop activities.

Homework and Office Hours

Physics is a problem-based discipline, you must do the homework in order to learn the material.
The online homework assignments should be started during the week in which the material is discussed in lecture. This homework will be submitted online at: [http://webassign.net/](http://webassign.net/) The course key which will also be posted on Canvas is:

WebAssign Course Key: rutgers 6938 4015

The course staff will hold office hours during the week in NPL 213. Please come and get any questions you have answered; this time is your time. Instructors’ office hours will be posted on Canvas. Recitation time will not be used to go over homework, it is your responsibility to seek help on the homework during office hours or campus tutoring. You are welcome to attend the office hours of ANY instructor to get help. The homework is due electronically; the deadlines are either Tuesday by 1:55pm or Thursday 11:59pm (but can be submitted anytime before then). NO HOMEWORK WILL BE ACCEPTED LATE.

Summary Problem Session:
The Summary Problem session takes place during the Monday recitation. In this session you will be working on problems that summarize the previous week’s work. You can make up missed Summary Problems on the same Monday (only) during any other regularly scheduled recitation meeting, but you must get permission from Dr. Ruggieri or Dr. Cochran BEFORE you can attend a different recitation time. These problems cannot be made up after Monday but the lowest score will be dropped when calculating your final grade. In general, at least 30% of the exam questions are based on the Summary problem activities.

Study Groups: You can register for an additional 1-credit study group that meets weekly and is led by one of the Lead Learning Assistants from this course. Look for an announcement on Canvas, in your email, and in lecture about this.

The Math and Science Learning Center Tutoring:
The MSLC is an innovative facility to assist students studying physics and related subjects. There you can find RLC tutoring for a variety of math and science courses, including this one. You can come find your colleagues and get answered any questions you may have. Please visit: [http://mslc.rutgers.edu/mslc](http://mslc.rutgers.edu/mslc)

Rutgers Learning Centers:
The Rutgers Learning Centers (RLC) can provide you with assistance with academic coaching, test anxiety, test-taking strategies, or one-on-one tutoring in many subjects. [http://rlc.rutgers.edu](http://rlc.rutgers.edu)

Students with Disabilities:
If you have a disability, you are urged to speak to the course supervisor early in the semester to make the necessary arrangements to support a successful learning experience. Also, you must arrange for the course supervisor to receive a letter from your College's Disabilities Concerns Coordinator verifying that you have a disability. A list of the College Coordinators can be found at: [http://www.physics.rutgers.edu/ugrad/disabilities.html](http://www.physics.rutgers.edu/ugrad/disabilities.html)
**Policy on Cheating:** You are encouraged to work with others in this course but the work you turn in must be YOUR work in YOUR words. If the work on your paper is the same as that of anyone else in the class, your College Dean will be notified and you will receive a “0” for the assignment. This means that if someone copies your work or you copy someone’s work, both papers will receive zeros. A zero on an exam will result in you failing this course, and possible expulsion from the University.

Your course grades are determined by the following:

**Hourly Exams (2) – 12.8% each:** There will be two common hourly exams that will be held in class from 1:40 – 3:00 PM. Each exam counts as 12.8% of the total course grade.

*EXAM POLICY:* Bring a pencil and a scientific calculator. You will not be permitted to bring anything else to the exams. The exam formula sheet is available on the course web page and will be provided to you at the exam.

**Design Practicals (3) and Presentation (1) – 12.8%:** There are three experimental design practicals during the semester that your group will prepare together in class. At the end of the semester you and your group will prepare a 5 minute oral presentation on one of the design practicals. The design practicals and presentation combined count as 12.8% of total grade.

**Final (1) – 25.6%:** The cumulative final exam is worth 25.6% of the total course grade, double that of a single hourly exam. The exam policy stated above is also followed for the final exam.

**Recitation Grade (Workshop – 8.4%, Summary Session – 12.8%):** Your recitation grade is determined by two activities, an oral quiz at the end of Workshops (typically Wed/Thurs classes), and work handed in at the end of Summary Problem Sessions (typically Mon classes). Workshop oral quiz grades are worth 8.4% of your total course grade, and Summary Problem Sessions are worth 12.8% of your total course grade.

**Online Homework – 12.8%:** Online homework due Tuesdays by 1:55pm and Thursdays by 11:59pm through WebAssign is worth 12.8% of your total course grade.

**Pre and posttests – 2%:** There is one in-class paper test and one online survey that you must take during the first week of classes as pretests, and again at the end of the semester as posttests. So you will need to complete four tests in all – two at the beginning (one in class, one online) and two at the end of the semester (one in class, one online) in order to receive credit for having taken the tests. Completing all four tests is worth 2% of the total course grade.

**Course Grade:**

<table>
<thead>
<tr>
<th>Course Grading Scale</th>
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<tbody>
<tr>
<td>100-90%</td>
<td>A</td>
</tr>
<tr>
<td>89-84</td>
<td>B+</td>
</tr>
<tr>
<td>83-78</td>
<td>B</td>
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<tr>
<td>77-72</td>
<td>C+</td>
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<tr>
<td>71-67</td>
<td>C</td>
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<tr>
<td>66-61</td>
<td>D</td>
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<tr>
<td>&lt; 60</td>
<td>F</td>
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