

GENERAL PHYSICS II (Sections 1-4)
COURSE 21:750:204
Spring 2020

Instructors, Emails, & Office Hours (*all physics office hours held in Smith basement)

Dr. Diane Crenshaw Jammula; diane.jammula@rutgers.edu; 365/211 Smith
Appointment Only Office Hours: Wednesday 2:30-3:30 (Smith 365/211)
Physics Office Hours: Thursday 1:00-2:20 (in Smith B27)
Dr. Claudiu Stan; claudiu.stan@rutgers.edu; Monday 4-5:20 (in Smith B27)
Dr. Dan Murnick; murnick@newark.rutgers.edu; TBD

Learning Assistants & Office Hours (*all physics office hours held in Smith basement)

Yasmine Ikram; Office Hour: TBD
Priscilla Mejia; Office Hour: TBD
*Students are encouraged to work with peers on hwk during office hours.

Class Time & Location

Large Room Meeting (LRM): Monday 2:30-3:50 & Wednesday 1-2:20, ACK 123
Small Room Meeting (SRM): 01: Tu 11:55-12:50 LSC 130 (Stan)
02: Tu 1:00-1:55 LSC 130 (Stan)
03: Tu 10:00 -10:55 Smith 240 (Stan)
04: Wed 10:00-10:55 LSC 130 (Murnick)

Required Materials:

- 1) Textbook: Etkina, E., Planinsic, M., Van Heuvelen, A. College Physics: Explore and Apply, 2nd Edition. Pearson. ISBN: 0134601823 (*You can get the ebook from Pearson for \$60; rent from Amazon for \$28; scan at the library for free (the textbook is on reserve at the library call number "PC DANA 201" and may be scanned for personal use. Ask a librarian for assistance).)
- 2) Print the weekly Handout and bring to class (or save and write on it electronically).
- 3) iClicker (I>Clicker+ ; I>Clicker2 ; or app. Register at www1.iclicker.com. If using the app, you must be on RU Wireless Secure for your app to work.)
- 4) Calculator (smartphone, tablets, computers, etc. may not be used on exams)

Physics Tutoring:

Rutgers Learning Center, Bradley 140. Drop-in or by appointment (search "Rutgers Newark Tutortrac" on Google & log in with NetID.) If you work with a tutor be sure you are doing the work, not them. Ask the tutor to look at your work and listen to your thinking.

Course Description: Physics 204 is the second course of the Physics 203 and Physics 204 algebra-based introductory physics course sequence. Students will develop both conceptual and mathematical understandings of physical phenomena and apply understandings to new scenarios. The course is interactive and being present is essential.

Course Goals:

1. Develop conceptual and quantitative models of physical phenomena.
2. Apply models to solve problems and understand physical scenarios.
3. Justify thinking using multiple representations (e.g. equations, graphs, words).
4. Collaborate with others to deepen understandings and improve solutions.

Weekly Topics:

1. 1st Law of Thermodynamics (Etkina Chapter 15)
2. 2nd Law of Thermodynamics (Etkina Chapter 16)
3. Electric Charge and Force (Etkina Chapter 17)
4. Electric Field I (Etkina Chapter 18)
5. Electric Field II (Etkina Chapter 18)
6. **Exam 1: Chapters 15-18**
7. DC Circuits I (Etkina Chapter 19)
8. DC Circuits II (Etkina Chapter 19)
9. *Spring Break!*
10. Magnetism (Etkina Chapter 20)
11. Electromagnetic Induction (Etkina Chapter 21)
12. **Exam 2: Chapters 19-21**
13. Reflection & Refraction (Etkina Chapter 22)
14. Mirrors and Lenses (Etkina Chapter 23)
15. Wave Optics & Electromagnetic Waves (Etkina Chapter 24)
16. Review
17. **Final Exam: Chapters 15-24**

Course Structure:

Large Room Meeting: Each week has a corresponding Handout with LRM I, SRM, and LRM II activities. Print the handout, bring it to class, write on it, 3-hole punch it, and store it in a 3 ring binder to study (or, save handouts electronically and write on them using a computer or tablet). Participation in these activities with your peers will facilitate your construction of knowledge in physics. Please sit directly next to 1-2 students each class to form groups of 2-3. LRMs also include clicker questions to assess your thinking and a reflection survey at the end of class to consider what you learned.

Small Room Meeting: Homework is due at the beginning of recitation. Then, you will work with your peers to solve example problems from the textbook. **Bring your textbook to check your work** (the ebook is most ideal). The purpose of SRM is to practice applying new ideas developed in LRM and lab. Please sit directly next to 1-2 students each class to form groups of 2-3. At the end of class, you will take a quiz to check your understanding.

Homework: After participation in LRM I, SRM, LRM II, and lab, you will read the textbook and complete problems from the textbook. Reading the textbook will bring together all course components and synthesize ideas learned in the past week. Solving problems will give you practice applying new ideas. You should schedule time in your calendar each week to read the textbook and do homework. You are encouraged to work with peers. For extra support, come to

physics office hours in Smith basement or go to tutoring at the Rutgers Learning Center. Ask instructors, LAs, tutors, and peers to look at your work and listen to your thinking. Learn to assess your own work using the Problem Solving Rubric.

Course Grades:

Clicker Questions: *You must attend LRMs to earn clicker question credit.* LRM activities are interspersed with clicker questions to check your understanding. Your performance on these questions provides valuable information to you and the instructor. Each question is worth 1 point for participation and 1 point for correctness. To view your grade, sign in to iclicker.com. Look at the column titled “Performance.” **Students sharing clickers (i.e. one student clicking for other students) will each lose all clicker question credit for the semester.**

Learning Survey: *You must attend LRMs to earn learning survey credit.* At the end of each LRM you will reflect on your learning. You will earn credit for completion.

Homework: *You must attend recitation to submit your homework. Homework is due at the beginning of recitation. Homework will not be accepted outside of recitation.* Homework covers the past week’s content and includes reading and a problem set. While you are encouraged to work in groups, each student is expected to submit their own unique work. Your homework will be checked for completion and immediately returned to you. You will then check your homework for correctness using an answer key posted online.

Quizzes: *You must attend recitation to take the quiz. Quizzes occur at the end of recitation.* Quizzes assess what you learned that day in recitation. You will need a calculator. Your performance on quizzes provides valuable information to you and the instructors. They are graded using the Problem Solving Rubric (see below).

Criterion	Perfect (2)	Needs work (1)	Needs a lot of work (0)
Clarity	The solution is clear, expressed in words and symbols, takes no effort to comprehend.	The words are lacking but the symbolic part is clear. Takes some effort to comprehend.	Takes a lot of effort to comprehend. There is only math, mostly numbers, not general equations and there are no words explaining the thought process.
Consistency	Two or more different representations (sketch, equation, graph, motion diagram, force diagram, bar chart, etc.) are present, they are correct and consistent with each other.	Two or more different representations are present, and they are consistent but there are mistakes in representations.	Mistakes in representations or different representations are inconsistent with each other.
Evaluation	The answer is evaluated using at least two of the methods listed below: unit analysis, extreme case analysis, reasonability of the answer, consistency of representations.	The answer is evaluated using only one of the methods listed in “Perfect”.	There is no evaluation or there are serious mistakes in the evaluation (wrong units, misunderstanding of how reasonable numbers are)

Exams: Two exams and a final will be given to assess what you have learned in the course. You will need a calculator. You may bring one 4x6” index card for Exam 1, two index cards for Exam 2, and three index cards for the Final Exam. You can write anything on the index cards (both sides) that you think you might want during the exam. The Final covers the entire course.

How to be successful in this course: Print the weekly Handout. During LRM, actively participate in activities. Think for yourself and share your thinking, even your crazy ideas. Play with ideas and make mistakes. This is how you learn. During SRM, try your best to solve example problems. Use representations (sketch, equation, graph, motion diagram, force diagram, bar chart, etc.) to help you reason through problems and justify your thinking. Check your work using the textbook. Assess your work using the Problem Solving Rubric. In lab, observe phenomena and create explanations for what you see. Test your hypotheses in testing experiments. After attending LRM I, SRM, LRM II, and lab, read the textbook. Notice how the book ties together ideas developed in each course component. **Reading the textbook will solidify new ideas and demonstrate how to apply them.** Do your homework. Use representations to help you reason through problems. Check your homework once solutions have been posted. Come to office hours to do your homework with peers and an instructor/LA. Read the book and try doing problems yourself before you ask for help. Trying is how you learn, and learning can be an uncomfortable process (consider how you learned to ride a bike!). Engage in doing physics: try, play, make mistakes, work together, learn.

Grading Scheme:

	%
Clicker Questions	10
Learning Survey	5
Homework	5
Quizzes	15
Exam 1	20
Exam 2	20
Final Exam	25

Overall Grade:

Letter Grade	Range
A	90.0+
B+	87.0 - 89.9
B	80.0 – 86.9
C+	77.0 – 79.9
C	70.0 – 76.9
D (not passing)	60.0 – 69.9
F (not passing)	< 60.0

Organization Strategies: You will need an organization system. We recommend:

- 1) Print the weekly Handout, bring it to class, write on it, 3-hole punch it, and store it in a 3-ring binder to study (or, save handouts electronically and write on them using a computer or tablet).
- 2) Do all homework in a graph paper composition notebook. Do not tear out the homework – the instructor will return it to you (or, do homework on loose leaf, staple, and keep in 3-ring binder).
- 3) Keep graded quizzes in a 3-ring binder.
- 4) Keep graded exams in a 3-ring binder.

Submissions: Please write your name, section number, and assigned student number (#1-45 for SRM) or seat number (#1-240 for LRM) on all submissions (homework, quizzes, exams). Your assigned student number and/or seat number is determined alphabetically and will be given to you by your instructor.

Attendance & Other Course Policies: You are expected to attend all classes. Each *clicker question* must be performed during LRMs, and each *homework* and *quiz* must be submitted in your assigned SRM.

Only absences due to significant special circumstances **with documentation** are excused, such as death in the family or illness with doctors note. Unfortunately, we are unable to accommodate lateness or absences due to traffic.

Because issues do arise, students are permitted one absence from LRM and one absence from SRM. This means that at the end of the semester I will drop three *clicker question* sessions (to account for technical difficulties as well), one *homework*, and one *quiz*, no questions asked. If you have no absences, I will drop your lowest grade.

For religious holidays, please report your absence using the Self-Reporting Absence Application: <https://sims.rutgers.edu/ssra/>. Your absence will be excused and your daily grade (*clicker question* or *homework* and *quiz*) will be dropped.

If you are absent from a day of class, you should keep up with the course content by doing the class activities in the Handout on your own time.

Make-up midterm exams will not be administered. If you have an excused absence (with documentation) on the day of a midterm exam, your Final Exam score will count twice.

Student attendance is recorded in LRMs and SRMs. **Students with more than four absences will automatically receive a failing grade.** If you think attendance may be a problem for you due to outside obligations, please meet with the instructor at the beginning of the semester or prior to your absences to discuss possible accommodations or solutions.

Grade disputes must be brought to the instructor within 2 weeks of receiving the grade. For example, a grade complaint about Exam 1 will not be considered at the end of the semester.

Rutgers Academic Integrity Policy: As an academic community dedicated to the creation, dissemination, and application of knowledge, Rutgers University is committed to fostering an intellectual and ethical environment based on the principles of academic integrity. Academic integrity is essential to the success of the University's educational and research missions, and violations of academic integrity constitute serious offenses against the entire academic community. The entire Academic Integrity Policy can be found here:
<http://academicintegrity.rutgers.edu/academic-integrity-policy/>

Rutgers Inclusion Resources: Rutgers University Newark (RU-N) is committed to the creation of an inclusive and safe learning environment for all students. RU-N has identified the following resources to further the mission of access and support:

- **Students with Disabilities:** Rutgers University welcomes students with disabilities into all of the University's educational programs. The Office of Disability Services (ODS) is responsible for the determination of appropriate accommodations for students who encounter barriers due to disability. In order to receive consideration for reasonable accommodations, a student with a disability must contact ODS, register, have an initial appointment, and provide documentation. Once a student has completed the ODS process (registration, initial appointment, and documentation submitted) and reasonable accommodations are determined to be necessary and appropriate, a Letter of Accommodation (LOA) will be provided to the student. The student must give the LOA to each course instructor, followed by a discussion with the instructor. This should be completed as early in the semester as possible as accommodations are not retroactive. More information can be found at ods.rutgers.edu. Contact ODS: (973) 353-5375 or ods@newark.rutgers.edu.
- **Religious Holiday Policy and Accommodations:** Students are advised to provide timely notification to instructors about necessary absences for religious observances and are responsible for making up the work or exams according to an agreed-upon schedule. The Division of Student Affairs is available to verify absences for religious observance, as needed: (973) 353-5063 or DeanofStudents@newark.rutgers.edu.
- **Counseling Services:** Counseling Center Room 101, Blumenthal Hall, (973) 353-5805 or <http://counseling.newark.rutgers.edu/>.

- **Students with Temporary Conditions/Injuries:** Students experiencing a temporary condition or injury that is adversely affecting their ability to fully participate in their courses should submit a request for assistance at: <https://temporaryconditions.rutgers.edu>.
- **Students Who are Pregnant:** The Office of Title IX and ADA Compliance is available to assist students with any concerns or potential accommodations related to pregnancy: (973) 353-1906 or TitleIX@newark.rutgers.edu.
- **Gender or Sex-Based Discrimination or Harassment:** Students experiencing any form of gender or sex-based discrimination or harassment, including sexual assault, sexual harassment, relationship violence, or stalking, should know that help and support are available. To report an incident, contact the Office of Title IX and ADA Compliance: (973) 353-1906 or TitleIX@newark.rutgers.edu. To submit an incident report: tinyurl.com/RUNReportingForm. To speak with a staff member who is confidential and does NOT have a reporting responsibility, contact the Office for Violence Prevention and Victim Assistance: (973) 353-1918 or run.vpva@rutgers.edu.

Physics 204 Sections 1-4 Spring 2020 Calendar		
*Calendar is tentative and subject to change as instructor sees fit.		
Week 1 (1/21-1/24)	Due	Topics & Activities
Large Room Meeting I (no class Monday)		
Small Room Meeting		1st Law of Thermodynamics (Chapter 15)
Large Room Meeting II		1st Law of Thermodynamics (Chapter 15)
Week 2 (1/27-1/31)	Due	Topics & Activities
Large Room Meeting I		1st Law of Thermodynamics (Chapter 15)
Small Room Meeting	HW 1: Chapter 15: Questions 2, 8, 14, Problems 7, 17, 26, 37 Quiz 1:	1st Law of Thermodynamics (Chapter 15)
Large Room Meeting II		2nd Law of Thermodynamics (Chapter 16)
Week 3 (2/3-2/7)	Due	Topics & Activities
Large Room Meeting I		Electric Charge and Force (Chapter 17)
Small Room Meeting	HW 2: Chapter 15: Question 10, Chapter 16: Questions 2,4, 14, Problems 1, 14, 21 Quiz 2:	Electric Charge and Force (Chapter 17)
Large Room Meeting II		Electric Charge and Force (Chapter 17)
Week 4 (2/10-2/14)	Due	Topics & Activities
Large Room Meeting I		Electric Field I (Chapter 18)
Small Room Meeting	HW 3: Chapter 17: Questions 4, 6, 16, Problems 3, 9, 26, 33, 54 Quiz 3:	Electric Field I (Chapter 18)
Large Room Meeting II		Electric Field I (Chapter 18)
Week 5 (2/17-2/21)	Due	Topics & Activities
Large Room Meeting I		Electric Field II (Chapter 18)
Small Room Meeting	HW 4: Chapter 18: Questions 1, 5, 16, Problems 3, 6, 12, 20.	Electric Field II (Chapter 18)

	Quiz 4:	
Large Room Meeting II		Electric Field II (Chapter 18)
Week 6 (2/24-2/28)	Due	Topics & Activities
Large Room Meeting I		Review
Small Room Meeting	HW 5: Chapter 18: Questions 8, 27, 30, Problems 26, 28, 38, 39	Review
Large Room Meeting II		Exam 1
Week 7 (3/2-3/6)	Due	Topics & Activities
Large Room Meeting I		DC Circuits I (Chapter 19)
Small Room Meeting	Quiz 5:	DC Circuits I (Chapter 19)
Large Room Meeting II		DC Circuits I (Chapter 19)
Week 8 (3/9-3/13)	Due	Topics & Activities
Large Room Meeting I		DC Circuits II (Chapter 19)
Small Room Meeting	HW 6: Chapter 19: Questions 11, 17, 22, Problems 4, 10, 12, 22 Quiz 6:	DC Circuits II (Chapter 19)
Large Room Meeting II		DC Circuits II (Chapter 19)
Week 9 (3/16-3/20)	Due	Topics & Activities
Large Room Meeting I		Spring Break!
Small Room Meeting		Spring Break!
Large Room Meeting II		Spring Break!
Week 10 (3/23-3/27)	Due	Topics & Activities
Large Room Meeting I		Magnetism (Chapter 20)
Small Room Meeting	HW 7: Chapter 19: Questions 6, 7, 26, Problems 31, 33, 34, 38 Quiz 7:	Magnetism (Chapter 20)
Large Room Meeting II		Magnetism (Chapter 20)
Week 11 (3/30-4/3)	Due	Topics & Activities
Large Room Meeting I		Electromagnetic Induction (Chapter 21)
Small Room Meeting	HW 8: Chapter 20: Questions 2, 6, 19, 27, Problems 4, 12, 27, 32 Quiz 8:	Electromagnetic Induction (Chapter 21)
Large Room Meeting II		Electromagnetic Induction (Chapter 21)
Week 12 (4/6-4/10)	Due	Topics & Activities
Large Room Meeting I		Review
Small Room Meeting	HW 9: Chapter 21:	Review

	Questions 3, 5, 10, 18, Problems 3, 13, 16, 19	
Large Room Meeting II		Exam 2
Week 13 (4/13-4/17)	Due	Topics & Activities
Large Room Meeting I		Reflection and Refraction (Chapter 22)
Small Room Meeting	Quiz 9:	Reflection and Refraction (Chapter 22)
Large Room Meeting II		Reflection and Refraction (Chapter 22)
Week 14 (4/20-4/24)	Due	Topics & Activities
Large Room Meeting I		Mirrors & Lenses (Chapter 23)
Small Room Meeting	HW 10: Chapter 22: Questions 6, 12, 25, 26, Problems 4, 11, 20, 23 Quiz 10:	Mirrors & Lenses (Chapter 23)
Large Room Meeting II		Mirrors & Lenses (Chapter 23)
Week 15 (4/27-5/1)	Due	Topics & Activities
Large Room Meeting I		Wave Optics & Electromagnetic Waves (Chapter 24)
Small Room Meeting	HW 11: Chapter 23: Questions 3, 7, 20, 26, Problems 5, 18, 32, 38 Quiz 11:	Wave Optics & Electromagnetic Waves (Chapter 24)
Large Room Meeting II		Wave Optics & Electromagnetic Waves (Chapter 24)
Week 16 (5/4)	Due	Topics & Activities
Large Room Meeting I		Review
Final Exam		
Final Exam (Sections 1-4, Jammula): Monday May 11th 3:00-6:00.	Final Exam: Chapters	*Students must bring final exam conflicts to the attention of their dean of students at least two weeks before the first final exam day.

Overall Course Grade Calculation:

Clicker Questions (10%): _____ x 0.10 = _____
(average)

Learning Survey (5%): _____ x 0.05 = _____
(average)

Homework (5%): _____ x 0.05 = _____
(average)

Quiz (15%): _____ x 0.15 = _____
(average)

Exam 1 (20%): _____ x 0.20 = _____

Exam 2 (20%): _____ x 0.20 = _____

Final (25%): _____ x 0.25 = _____

+

_____ COURSE GRADE: _____

Grading Scheme:

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Learning Survey	5
Homework	5
Quiz	15
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Exam 2	20
Final Exam	25

Overall Grade:

Letter Grade	Range
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