

Analytical Physics 2a
01:750:227
Fall 2020

Instructor: Professor Jak Chakhalian

Summary: Electrostatics, particles in electric and magnetic fields, electromagnetism, circuits, Maxwell's equations, electromagnetic radiation.

This course is intended for students majoring in engineering or physics.

Pre-requisites: 01:750:116 or 01:750:124 or 01:750:271 and 01:640:152 (CALC2)

Co-requisites: None, but 01:750:229 strongly recommended

Meeting times: Two 55-minute lectures per week offered at two times (both identical)
Lecture: M-Th 1 (8:55 am – 9:50 am), M-Th 2 (10:35 am – 11:30 am)
Recitations: One 80 minute recitation per week

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

LMS: Canvas

Remote Instruction:

Provisional Plans for Remote Instruction (subject to change):

- The following resources and activities will be provided asynchronously:
 - The lecture slides will be posted in advance of the lecture.
 - Video clips of the weekly demos will be posted in advance of the lecture, and a short quiz may be required to be answered prior to the lecture. In addition, periodic video clips based on specific concepts related to that week's material will be posted on Canvas (before and/or after lecture), followed by taking a short quiz.
 - The weekly homework will be assigned and submitted via Expert TA.
- The weekly lectures and recitations will be streamed synchronously.
 - The lectures (only) will be recorded and posted to Canvas for later viewing.
 - Students who miss a recitation, and have a valid reason for missing it, may attend another recitation (only one with the same TA!). This will be allowed by permission only.
 - The lowest two quizzes will be dropped.
 - There will also be other opportunities provided throughout the semester for extra credit.
- Weekly homeworks will be assigned and submitted via Expert TA.
- Exams, quizzes, will be assigned, posted and graded on Canvas.
- Exams will be a mixture of multiple choice, numerical, and word problems. Students will have a time window within which the exam can be taken (e.g. 24 or 48hrs), and once started the exam will be a fixed time (i.e. 80 minutes for the midterms, 3hrs for the final exam). Academic integrity (see below) must always be followed! You may NOT contact anyone or

receive/give any assistance via any means or use other resources during the exam. The exam answers must be entirely your own.

- The professor and the TA will hold online weekly office hours. In addition, there will be a Canvas discussion board setup for students to post questions at any time during the semester; this is strongly encouraged, including during the synchronous lectures. In addition, the professor can setup one-on-one virtual meetings with students as needed.
- Technology requirements: Students will need a microphone (for lectures, recitations, and office hours that are conducted online) and either a phone camera or a scanner (for possibly needing to upload material into Canvas for homeworks, or discussion board questions). A webcam is not required.

Provisional Grading Plans:

- First Midterm: 17%
- Second Midterm: 17%
- Final Exam: 32%
- Recitation Quiz and collaborative work: 20%
- Homework: 14%

Schedule (provisional):

Week:	Topic
Week 1	Electric Charge and Forces
Week 2	Electric field, flux, Gauss's Law
Week 3	Gauss's Law, electric potential
Week 4	Electric potential, capacitance
Week 5	Capacitance
Week 6	Current, resistance, ohm's law, electrical energy and power
Week 7	DC circuits, Kirchhoff's Law, charge/discharge of capacitors
Week 8	Magnetic fields and forces, Biot-Savart Law
Week 9	Ampere's Law, solenoids, magnetism in matter
Week 10	Faraday's Law, induced/motional emf, eddy currents
Week 11	Maxwell's equations, EM waves
Week 12	EM waves, inductance
Week 13	RL, RC, RLC circuits, AC circuits
Week 14	AC circuits and transformers

Academic Integrity:

Students are expected to maintain the highest level of academic integrity. You should be familiar with the university policy on academic integrity: <http://academicintegrity.rutgers.edu/academic-integrity-policy/> Violations will be reported and enforced according to this policy.

Use of external sources to obtain solutions to homework assignments or exams is cheating and is a violation of the University Academic Integrity policy. Cheating in the course may result in penalties ranging from a zero on an assignment to an F for the course to expulsion from the University. Posting of homework assignments, exams, recorded lectures, or other lecture materials to external sites without the permission of the instructor is a violation of copyright and constitutes a facilitation of dishonesty, which may result in the same penalties as explicit cheating.

Not only does the use of such sites violate the University's policy on Academic Integrity, using such sites interferes with your achievement of the learning you are paying tuition for. Assignments, quizzes, and exams are given not simply to assign grades, but to promote the active learning that occurs through completing assignments on your own. Getting the right answer is much less important than learning how to get the right answer. This learning is critical to your success in subsequent courses and your careers.

Student wellness Services

Student Counseling, ADAP & Psychiatric Services (CAPS) wellness for non-emergency psychological health issues services (848) 932-7884, 17 Senior Street, New Brunswick, NJ 08901
<http://health.rutgers.edu/medical-counseling-services/counseling/>

Violence Prevention & Victim Assistance (VPVA), (848) 932-1181, 3 Bartlett Street, New Brunswick, NJ 08901, <http://www.vpva.rutgers.edu/>

Office of Disability Services (848) 445-6800, Lucy Stone Hall, Suite A145, Livingston, 54 Joyce Kilmer Avenue, Piscataway, NJ 08854, <https://ods.rutgers.edu/>

Scarlet Listeners for confidential peer counseling and referral hotline, (732) 247-5555,
<http://www.scarletlisteners.com>