

Physics 223: Analytical Physics III

Syllabus, fall 2008

Prof. James McLean

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Summary Course Website: <http://www.geneseo.edu/~mclean/AnalytIII/>

(Full Course Website available in mycourses.geneseo.edu)

Learning Outcomes

This class will cover electromagnetic radiation (including its interference, diffraction, and quantum nature), elementary fluids and thermodynamics, and special relativity.

Students completing this course should be able to:

1. solve a variety of problems pertaining to the material covered in the course,
2. demonstrate an understanding of wave phenomena,
3. demonstrate an understanding of special relativity,
4. describe different interactions of photons with matter based on an introductory understanding of the experimental basis of quantum theory.

Times and places:

Lectures: Newton 201; Mon., Wed., and Fri. 10:30–11:20am

Midterm Exams: Newton 214; Thursdays, Oct. 9 and Nov. 13, 7:00–9:00pm

If you have conflicts with these times, notify me as soon as possible and appropriate arrangements will be made.

Final Exam: Newton 201; Friday, Dec. 12, 8:00–11:00am

Office hours: Tue. 1:00–3:30pm, Wed. 1:00–2:00, Thurs. 2:00–3:30pm

I am also available at other times. See the schedule on my web site. Just stop by my office, or if you want to ensure that I'll be there, contact me by phone or email.

Required materials:

Textbook: *Fundamentals of Physics, 8th edition*, by Halliday, Resnick, and Walker.

Textbook: *Modern Physics, 3^d edition*, by Thornton and Rex.

Required coursework and grading (with fraction of final grade):

36% Homework and Quizzes

40% Midterm Exams (two)

24% Comprehensive Final Exam.

Homework:

Homework will be administered through CAPA, the “Computer Assisted Personalized Approach” system. You can access this either from the course’s main web page or directly at <http://capa.geneseo.edu/>. Answers are entered via the World Wide Web.

Homework generally will be due each Wednesday afternoon. Note that if there are system-wide problem with the network, due dates may be extended. However, individual computer difficulties will not be accepted as excuses for non-completion of assignments.

A few homework problems will require a written submission. For these problems you may consult with your colleagues and with me, **but the work that you submit must be your own.** This means that if I call upon you to explain your solution, you should be able to do so in

complete detail. Written out problems will be graded each week by either randomly choosing 1–2 problems grading, or by giving an **unannounced** quiz on the due date.

Some General Comments:

Although test scores may be scaled up during grading, there will be no overall “curve” for the grading of the course. See my web site for more details on my grading policy.

If you need to return materials to me outside of class, your best option is to bring it to my office. Slide it under my door if I’m not in. Homework will be accepted for full credit if it is in my hands before solutions are posted. After solutions are posted, partial credit may be given.

Help available:

Remember that one important function of homework is for you to monitor your progress. If you are having problems with the homework, it should serve as a warning to take immediate remedial action. If you find yourself getting into difficulties, **do something about it—fast!** The arithmetic of averages shows that you can’t afford to delay if you start to get into grade trouble.

SUNY Geneseo will make reasonable accommodations for persons with documented physical, emotional or learning disabilities. Students should consult with the Director in the Office of Disability Services (Tabitha Buggie-Hunt, 106A Erwin, tbuggieh@geneseo.edu) and their individual faculty regarding any needed accommodations as early as possible in the semester. Further information available at <<http://disability.geneseo.edu/>>.

Schedule

WEEK OF...	LECTURE TOPICS	EXAM	LAB IN PHYS 226
Aug. 25	Fluids		Uncertainties & Solver
Sept. 1 (only WF)	Induction, Faraday & Maxwell		Geometric Optics
8	E&M Waves		Permittivity of Free Space
15	Interference		Polarization of Light
22	Diffraction		Ultrasonic Interference and Diffraction
29	Thermal Physics		
Oct. 6 (only MW)	Thermodynamics	Exam 1	The Speed of Light
13 (only WF)	Thermal Energy Transfer		
20	Kinetic Theory of Gases		The Bohr Atom
27	Quantum Light		The Michelson Interferometer
Nov. 3	Einstein: Photoelectric Effect & Special Relativity		Blackbody Radiation
10	Lorentz Transformations	Exam 2	Photoelectric Effect
17	Minkowski Diagrams, Doppler		Chaos
24	NO CLASS		
Dec. 1	Mass-Energy and Momentum		Oral Presentations
8 (only M)	Compton Effect		
12 8:00 AM		Final	