

Phys 5300, Special Topics: Plasmonics and Metamaterials

Syllabus

Instructor: Luis Grave de Peralta
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Course Information

- Conferences place and time: TT 11:00 AM – 12:20 PM, Mathematics 00112
 - Textbook: Dror Sarid and Willian Challener, "Surface Plasmon: Theory, Mathematica Modeling, and Applications," Cambridge University Press, 2010.
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Course Description:

- This course covers the theory and applications of surface plasmon polaritons (SPP). Experimental demonstrations will be conducted in a research laboratory. Mathematica simulations of experiments will be done in class. Topics covered include: electromagnetism of planar surface waves, plasmonic materials, metamaterials (plasmonic crystals, negative index materials, superlenses, invisibility cloaks), SPP, techniques for exciting and observing SPP, and applications (sensors, imaging, nanophotonics).
 - **Exams:** There will be three take-home exams with no final exam (see Class Schedule for dates).
 - There will be no make-up exams.
 - The lowest exam grade will be dropped since there are no makeup exams.
 - **Homework:** Articles to read will be assigned in Thursday classes every week. In the next-Thursday classes, randomly selected students will make a short presentation in front of the class about the article assigned. These students will be graded according to their work.
 - **Grading:** Homework 50%, each exam 25% towards your final course grade. The grading scale is A=100-87%, B=86-74%, C=73-62% and D=61-50%, F=49 to 0%.
 - **Help:** Do not wait until the last second to seek help. If you do not understand the material or feel that you are falling behind, seek help as soon as possible.
 - Your instructor is available during office hours. If you cannot make it, call him or email him.
 - Academic dishonesty will not be tolerated and will be treated according to the rules outlined in the Student Handbook.
 - Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor's office hours. Please note instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, you may contact the Student Disability Services office in 335 West Hall or 806-742-2405.
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Course Goals

- Be familiar with experimental techniques for exciting and observing SPP.
 - Know the fundamentals of the electromagnetic description of light propagation in plasmonic structures.
 - Be familiar with the use of Mathematica for simulation porpoises.
 - Know the fundamentals of modern applications of SPP.
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Learning Assessment

- Certain problems on the exams will explicitly require facility with the course objectives and will be used as learning assessment tools.