

EE 5389 Quantum Optics in Micro- and Nano-Cavities

Spring Semester 2007

Monday/Wednesday 1:00–2:20 pm, GACB Room 103

Instructor: Michael Vasilyev, Asst. Prof. **Office:** NanoFAB, Room 220
Office Hours: MW, 2:30 pm–3:50 pm **Phone:** (817) 272-1224
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Course Learning Goals/Objectives: Learn the principles of light-matter interaction enhancement in micro- and nano-structures, and its applications.

Course Description: We will discuss the mechanism of strong enhancement of interaction of light and matter in micro- and nano-cavities, leading to dramatic increase of light emission (Purcell effect) and transformation of incoherent spontaneous emission into coherent Rabi oscillations. Applications to single-photon lasers, optical transistors, and quantum gates will be discussed.

Topic schedule:

- Elements of Quantum Mechanics
- Traveling-Wave and Standing-Wave Optical Resonators
- Einstein's Coefficients
- Single Emitter in a Microcavity
- Purcell Effect
- Coherent Interaction of Light and Matter
- Applications

Course Evaluation and Final Grade:

Attendance	50%
Term paper	50%

Attendance Policy: Mandatory

Drop Policy: As per University guidelines. See the Registrar's Bulletin or the University Calendar in the front part of the UTA catalog for drop dates.

Student Evaluation of Teaching

Students will be asked to complete instructor/course evaluation forms at the end of the semester.

Americans with Disabilities Act:

The University of Texas at Arlington is on record as being committed to both the spirit and letter of federal equal opportunity legislation; reference Public Law 93112—The Rehabilitation Act of 1973 as amended. With the passage of new federal legislation entitled Americans with Disabilities Act – (ADA), pursuant to section 504 of The Rehabilitation Act, there is renewed focus on providing this population with the same opportunities enjoyed by all citizens.

As a faculty member, I am required by law to provide “**reasonable accommodation**” to students with disabilities, so as not to discriminate on the basis of that disability. Student responsibility primarily rests with **informing faculty at the beginning of the semester and in providing authorized documentation through designated administrative channels.**

If you require an accommodation based on disability, I would like to meet with you in the privacy of my office, during the first week of the semester, to make sure you are properly accommodated.

Academic Dishonesty

It is the philosophy of The University of Texas at Arlington that academic dishonesty is a completely unacceptable mode of conduct and will not be tolerated in any form. All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures. Discipline may include suspension or expulsion from the University.

“Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.” (Regents' Rules and Regulations, Part One, Chapter VI, Section 3, Subsection 3.2, Subdivision 3.22).

ANY CHEATING WILL RESULT IN SEVERE PENALTIES.

The University of Texas at Arlington supports a variety of student success programs to help you connect with the University and achieve academic success. They include learning assistance, developmental education, advising and mentoring, admission and transition, and federally funded programs. Students requiring assistance academically, personally, or socially should contact the Office of Student Success Programs at 817-272-6107 for more information and appropriate referrals.