



OSE 6335: Nonlinear Guided Wave Optics

College of Optics and Photonics, Fall 2016
University of Central Florida

COURSE SYLLABUS

Instructor:	Demetrios Christodoulides	Term:	Fall 2016
Office:	CREOL Room 210	Class Meeting Days:	Mon & Wed
Phone:	407-882-0074	Class Meeting Hours:	10:30-11:45
E-Mail:	demetri@creol.ucf.edu	Class Location:	CREOL 102

I. **Welcome!**

Welcome to OSE 6335-Nonlinear Guided Waves

II. **University Course Catalog Description**

The physics and applications of nonlinear optical interactions in fibers and planar waveguides is discussed, including parametric processes, all-optical effects and solitons.

III. **Course Overview**

Nonlinear guided wave optics will play an ever increasing important role in tomorrow's optical science and technology. This course aims to introduce graduate students to the fascinating and exotic world of nonlinear photonic structures and nonlinear dynamics. Topics to be covered range from nonlinear effects in optical fibers to some very recent developments in nonlinear optical lattices and photonic crystal systems.

IV. **Course Prerequisites**

OSE 6334-Nonlinear Optics

V. **Course Credits**

3 Credit Hours

VI. **Required Texts and Materials**

No Textbook Required

VII. Topics Covered

- Aspects of nonlinear dynamics-integrability
- Linear processes: Diffraction, Dispersion
- Waveguides, coupled-mode theory
- Optical nonlinearities, mechanisms
- Nonlinear waveguide structures
- Non reciprocity due to nonlinearity
- Self-phase modulation
- Optical Solitons, Modulational instability
- Spatial solitons, vector and incoherent interactions,
- Beam propagation methods
- Optical Compression, Bragg solitons
- Nonlinear waveguide devices
- Chi-2 guided wave processes and solitons
- Waveguide arrays and discrete nonlinear interactions
- Ginzburg-Landau solitons
- Nonlinear phenomena in particle suspensions
- Four wave mixing
- Self-induced transparency
- Raman Effects

VIII. Basis for Final Grade

Grading Scale (%)	
90-100	A
80 - 89	B
70 - 79	C
60 - 69	D
0 - 59	F

IX. Course Policies:

Disability Access:

The University of Central Florida is committed to providing reasonable accommodations for all persons with disabilities. This syllabus is available in alternate formats upon request. Students who need accommodations must be registered with Student Disability Services, Ferrell Commons Room 185, phone (407) 823-2371, TTY/TDD only phone (407) 823-2116, before requesting accommodations from the professor.

Professionalism Policy:

Per university policy and classroom etiquette; mobile phones, iPods, *etc.* **must be silenced** during all classroom and lab lectures. Those not heeding this rule will be asked to leave the classroom/lab immediately so as to not disrupt the learning environment. Please arrive on time for all class meetings. Students who habitually disturb the class by talking, arriving late, *etc.*, and have been warned may suffer a reduction in their final class grade.

Academic Conduct Policy:

Academic dishonesty in any form will not be tolerated. If you are uncertain as to what constitutes academic dishonesty, please consult The Golden Rule, the University of Central Florida's Student Handbook (<http://www.goldenrule.sdes.ucf.edu/>) for further details. As in all University courses, The Golden Rule Rules of Conduct will be applied. Violations of these rules will result in a record of the infraction being placed in your file and

receiving a zero on the work in question AT A MINIMUM. At the instructor's discretion, you may also receive a failing grade for the course. Confirmation of such incidents can also result in expulsion from the University

University Writing Center:

The University Writing Center (UWC) is a free resource for UCF undergraduates and graduates. At the UWC, a trained writing consultant will work individually with you on anything you're writing (in or out of class), at any point in the writing process from brainstorming to editing. Appointments are recommended, but not required. For more information or to make an appointment, visit the UWC website at <http://www.uwc.ucf.edu>, stop by MOD 608, or call 407.823.2197.

X. Important Dates to Remember

Drop/Swap Deadline:

Thu, Aug 25th 2016

Withdrawal Deadline:

Mon, Oct 31st 2016

Final Examination:

Mon, Dec 12th 2016

10:00AM-12:50PM

Holidays:

Labor Day: Mon, Sept 5th, 2016

Veteran's Day: Friday, Nov 11th 2016

Thanksgiving: Thurs, Nov 24-25th 2016

Religious Observances

Students are expected to notify their instructor in advance if they intend to miss class to observe a holy day of their religious faith. For a current schedule of major religious holidays, see the Faculty Center's main web page under "Calendars," and for additional information, contact the Office of Diversity Initiatives at 407-823-6479.