

1. ECE 503: Ultrafast Optics
2. 3 credits: 2-75 minute lecture sessions/week.
3. Randy Bartels
4. None – class notes provided
5. Course Information
 - a. Principles and theory behind ultrashort pulse generation, amplification, and manipulation
 - b. Prerequisites: ECE 341; ECE 342
 - a. Selected Elective: Electrical Engineering; Lasers & Optical Engineering; Computer Engineering
6. Goals for the Course
 - a. Course Learning Objectives
 - i. Describe the principles of short laser pulses and how to control and engineer pulse shape propagation in complex optical systems
 - ii. Identify engineering design principles of femtosecond laser principles
 - iii. Design and evaluate optical system using the principles of ultrafast optics
 - iv. Evaluate and interpret data from ultrafast optical experiments and measurements
 - b. Student Outcomes
 1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
 3. An ability to communicate effectively with a range of audiences
 4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
 7. An ability acquire and apply new knowledge as needed, using appropriate learning strategies
7. Topics Covered
 - Linear pulse propagation and manipulation
 - Short pulse generation and amplification
 - Characterization of short pulses
 - Experimental techniques using short pulses