

ECE 404: Experiments in Optical Electronics

IN

OUT

Mathematical Concepts

- Understand calculus
- Understand matrix algebra

Physics Concepts

- Understand electromagnetic waves
- Understand waveguides
- Know basic geometric optics laws

Pre-requisites

- ECE 342 with a C or higher

Concepts:

- Optical cavities
- Gas and semiconductor lasers
- Light propagation through different components photodetectors
- Optical fiber link; frequency response of optical devices
- Holography

Applications:

- Lasers, stable cavities; light propagation in fibers
- Detection of optical signals

Tools:

- Geometrical and electromagnetic optics
- Signal analysis using different software tools
- Engineering of optical systems
- Oral and written communication

Optical Electronics Components

- Know the fundamental concepts that are building blocks of lasers and optical systems
- Acquire hands on skills to assemble optical systems
- Record and analyze data
- Maintain a professional lab notebook
- Present results of experiments

Analytical and Laboratory Skills

- Identify, formulate and solve optical engineering problems
- Develop and conduct appropriate experimentation, analyze and interpret data
- Record data on research notebooks
- Present results to a broad audience