

OPTI617 Practical Optical System Design

This course starts with system specifications, system engineering, fundamental optical design, optical thin film design, design for manufacturing, tolerancing, and stray light analysis, and then discusses the designs of various optical systems. For each system, the course will cover principles, design methods, and design examples

This course will provide students hand-on experiences in designing practical, manufacturable optical systems.

Prerequisite: OPTI 517

Course outline

1. Introduction to optical design
2. Optical system engineering
 - a. System specification
 - b. Light sources and detectors
 - c. Optical materials
 - d. Fabrication methods
3. Optical system design
 - a. Correction of aberrations
 - b. Special correction features
4. Design for manufacturability
5. Tolerancing
6. Stray light and ghost image analysis
7. Optical thin film
8. Telescopes
9. Microscope optics
10. Biomedical imaging systems
11. Photographic systems
12. Display systems
13. Lithographic systems
14. Infrared systems
15. Miscellaneous topics