OPTI617 Advanced Optical Design

This course will teach the principle of optical design, optical systems engineering, optimization of optical system, design for manufacturability, and optical designs of various optical systems. For each system, the course will cover the principles, design methods, and design examples. Students can learn practical optical design methods for real world applications.

In addition to home works, students will design one complete optical system.

Prerequisite: OPTI 517

Course outline
1. Introduction to optical design
2. Optical systems engineering
3. Image quality criteria
4. Principle of optical design
5. Optimization of optical systems
   a. Correction of aberrations
   b. Special correction features
6. Design for manufacturability
   a. Tolerancing
   b. Opto-mechanical system
   c. Stray light and ghost image analysis
7. Illumination systems
8. Microscopes
9. Telescopes
10. Display systems
11. Zoom systems
12. Photographic systems
13. Infrared systems
14. Biomedical imaging systems
15. Miscellaneous systems

Grading:
Homework: 50%
Final project: 30%
Presentation: 20%