

**OPTI 340, Optical Design
Spring 2014**

Lecture: MWF, 8:00 – 8:50 a.m., Meinel Building, Room 410
Discussion Session: Tues, 8:00 – 9:15 a.m., Meinel Building, Room 410

Instructor:

Yuzuru Takashima, Ph.D., Associate Professor

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Office Hours: Mondays and Wednesdays, 9-10 a.m., also by appointment

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Teaching Assistant:

Alonzo J Espinoza

Office Hours: TBA

Phone:

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Text:**Required:**

- Kidger, Michael. J (2001). *Fundamental Optical Design*. SPIE monograph. ISBN-10: 0819439150

Recommended:

- Smith, Warren (2007). *Modern Optical Engineering* (4th ed.). McGraw-Hill. ISBN-10: 0071476873
- Jenkins, Francis and White, Harvey (2001). *Fundamentals of Optics*. McGraw-Hill, ISBN-10: 0072561912

Recommended References:

- Code V Reference manuals, Test Drive and Introductory user's Guide (See handout for instructions on downloading).
- Dereniak and Dereniak (2008). *Geometrical and Trigonometric Optics*. Cambridge. ISBN: 9812382240
- Geary, Joseph M. (2002). *Introduction to Lens Design: With Practical Zemax Examples*. Willmann-Bell. ISBN-10: 0943396751

Course Description:

This course will provide students with a fundamental understanding of 3rd order aberrations as applied to lens design. Emphasis will be on practical understanding of optical design procedure and the use of an optical design program (CodeV, ORA) to correct for the 3rd order aberrations.

Lectures:

Depending on class size and student approval, an accelerated schedule will be followed to deliver the class lecture so that more time is available for the final design project. See separate lecture schedule.

Course objectives:

The primary objective of this course is to enable an optical engineering student to:

1. Design optical systems for a particular application based on specifications.
2. Develop insight to determine the necessary image quality for an application as well as the limitations of designs.
3. Develop the knowledge to evaluate lens designs via various figures of merit, i.e., MTF, Strehl ratio.
4. Provide an understanding of classical lens designs, characteristics/limitations.

Coursework Policies:**Discussion Session:**

Attendance is required. In the discussion session, students can interact with Instructor and Teaching Assistant to discuss and explore various design issues. Also, the time slot will be used for demo experiments, lectures, and project meetings.

Homework:

All problem sets and design projects are to be handed in during class on the date due (by 8:50 am). Late homework will be marked off by 50%. All homework, exams, design projects, etc., must include your name and course number (OPTI 340) and must be done on one side of an 8½ x 11 sheet of paper. A deduction of 5 points will be taken from a student's homework if his/her cellular phone rings during class.

Exams:

No regarding after two weeks from the solution is posted.

Design Reports:

All design projects should be completed and turned in as a formal written report. Grammar and style play an important part in your grade. No solutions will be posted for design projects, due to the number of possible correct solutions.

Course Grading:

Homework Problems.....	10%
Design Reports	10%
Midterm and Oral Exams	40%
Final/Project Presentation & Report.....	40%

Academic Integrity

According to the [Arizona Code of Academic Integrity](#), "Integrity is expected of every student in all academic work. The guiding principle of academic integrity is that a student's submitted work must be the student's own." Unless otherwise noted by the instructor, work for all assignments in this course must be conducted independently by each student. Co-authored work of any kind is unacceptable. Misappropriation of exams before or after they are given will be considered academics misconduct.

Misconduct of any kind will be prosecuted and may result in any or all of the following:

- Reduction of grade
- Failing grade
- Referral to the Dean of Students for consideration of additional penalty, i.e., notation on a student's transcript re: academic integrity violation, etc.

Students with Learning Disabilities

If a student is registered with the [Disability Resource Center](#), he/she must submit appropriate documentation to the instructor if he/she is requesting reasonable accommodations.

The information contained in this syllabus may be subject to change with reasonable advance notice, as deemed appropriate by the instructor.