

EENG 4010/5940 Introduction to Photonics and Optical Engineering

Instructor: Shuping Wang
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Spring 2021
Time: (TuTh) 11:30am - 12:50pm
Meeting Place: Remote
Office Hours: (TuTh) 2:00pm - 3:30pm

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Office hours: By appointment

Course Number, Title, Credit Hours

EENG 4010-007, Topics in Electrical Engineering, 3 hours.
EENG 5940-007, Advanced Topics in Electrical Engineering, 3 hours.
EENG 5940-607, Advanced Topics in Electrical Engineering, 3 hours.

General Description

The nature of light and its properties, basic geometrical and physical optics, optical system and design considerations.

Course Requirements

Prerequisites

Knowledge of differential equations, EENG 3410 or equivalent is very helpful.

Required Textbooks

Optics, Eugene Hecht, Pearson Education, 5th edition, ISBN: 9780133977226, 2017.

Reference Texts

1. Optics for Engineers, Charles A. DiMarzio, CRC Press, 1th edition, ISBN: 9781439807255, 2011.
2. Modern Optical Engineering, W. Smith, McGraw Hill, 4th edition, ISBN: 9780071593755, 2008.

Attendance

The class will be conducted via Zoom during the scheduled days and times (i.e. Tuesdays and Thursdays from 11:30am to 12:50pm). Attendance is mandatory. The lecture will also be recorded and available as well should you, the student, run into a time conflict with another class or scheduled event.

Homework

- Homework needs to be uploaded to Canvas at the due date/time.
- Homework turned in late will be penalized 50%. No homework accepted after 24 hours.
- Students have one week to contest any grade once grade posted.

Exams

There will be two exams (this includes the final exam), each worth 100 points. Exams will be based on text readings, handouts, class exercises, and class lectures and discussions. Students are responsible for all text material, regardless of whether we review the text material in class or not.

Missed Exams

You will be allowed to make up a missed exam only if you have a documented university excused absence (refer to UNT Policy 06.039). If you know in advance that you will miss an exam, you **MUST** contact the instructor before the scheduled exam. Make-up exams will not contain the same questions.

Grading Elements and Weights

Midterm Examination	40%
Final Examination	40%
Homework	20%

A	≥90%
B	80 – 89%
C	70 – 79%
D	60 – 69%
F	≤59%

Class Policies

1. This syllabus is subject to change at any time during the semester with changes to be announced in class.
2. The UNT Catalog procedures on cheating and plagiarism will be vigorously enforced. It is the duty of all students to protect their work so it is not available to others for submission as their efforts. This is especially true of files that are generated on the computer. Students who knowingly allow others to use their work are partners in this unethical behavior.
3. The Student Perceptions of Teaching (SPOT) is a requirement for all organized classes at UNT. This short survey will be made available to you at the end of the semester, providing you a chance to comment on how this class is taught. I am very interested in the feedback I receive from students, as I work to continually improve my teaching. I consider the SPOT to be an important part of your participation in this class.

Disabilities Accommodation

The University of North Texas complies with Section 504 of the 1973 Rehabilitation Act and with the Americans with Disabilities Act of 1990. The University of North Texas provides academic adjustments and auxiliary aids to individuals with disabilities, as defined under the law. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring

accommodation, please see the instructor and/or contact the Office of Disability Accommodation at 940-565-4323 during the first week of class.

Tentative Course Outline/Schedule

- Introduction, Wave Motion (1/12, 1/14)
- The Propagation of Light – Reflection and Refraction (1/19, 1/21)
- Geometrical Optics - Lenses, Mirrors, Prisms, Fiberoptics (1/26, 1/28, 2/2, 2/4, 2/9, 2/11)
- More on Geometrical Optics - Thick Lenses and Lens Systems, Aberrations (2/16, 2/18, 2/23, 2/25)
- **Midterm Exam** (Tuesday, 3/2)
- Electromagnetic Theory, Photons, and Light (3/4, 3/9)
- The Propagation of Light – Electromagnetic Approach (3/11, 3/16)
- Polarization (3/18, 3/23, 3/25)
- The Superposition of Wave/Interference (3/30, 4/1, 4/6, 4/8)
- Diffraction (4/13, 4/15)
- Review (Tuesday, 4/20)
- **Final Exam:** Tuesday, 04/27, 10:30am-12:30pm