

Course Number and Title: LAS 272 Geometrical Optics and Lasers

Campus Location:

Stanton

Effective Date:

2022-52

Prerequisite:

(MAT 193 or higher), PHY 205 and PHY 281

Co-Requisites:

None

Course Credits and Hours:

4.00 credits

3.00 lecture hours/week

2.00 lab hours/week

Course Description:

This laboratory-based laser course includes reflection and refraction (at plane and curved surfaces), thin and thick lenses, stops and apertures, matrix optics, lasers and resonators, laser systems, and applications to fiber optics.

Required Text(s):

Obtain current textbook information by viewing the [campus bookstore - https://www.dtcc.edu/bookstores](https://www.dtcc.edu/bookstores) online or visit a campus bookstore. Check your course schedule for the course number and section.

Additional Materials:

None

Schedule Type:

Classroom Course

Disclaimer:

None

Core Course Performance Objectives (CCPOs):

1. Solve problems involving reflection. (CCC 2, 6; PGC 1)
2. Solve problems involving refraction. (CCC 2, 6; PGC 1)
3. Solve problems involving thin lenses. (CCC 2, 6; PGC 1)
4. Solve problems involving thick lenses. (CCC 2, 6; PGC 1, 2)
5. Solve problems involving stops and apertures. (CCC 2, 6; PGC 1, 2)
6. Solve problems involving matrix optics. (CCC 2, 6; PGC 1, 2)
7. Investigate and solve problems using experimental techniques. (CCC 1, 2, 3, 7; PGC 1, 2, 3)

See Core Curriculum Competencies and Program Graduate Competencies at the end of the syllabus. CCPOs are linked to every competency they develop.

Measurable Performance Objectives (MPOs):

Upon completion of this course, the student will:

1. Solve problems involving reflection.
 1. Solve problems involving planar, parabolic, elliptic, and spherical reflectors.
 2. Solve problems involving image formation.
 3. Solve problems involving fiber optics.
2. Solve problems involving refraction.
 1. Solve problems involving Snell's law.
 2. Solve problems involving Gaussian optics.
 3. Solve problems involving fiber optics.
3. Solve problems involving thin lenses.
 1. Solve problems involving convex lenses.
 2. Solve problems involving concave lenses.
4. Solve problems involving thick lenses.
 1. Solve problems involving positive thick lenses.
 2. Solve problems involving negative thick lenses.
5. Solve problems involving stops and apertures.
 1. Solve problems involving entrance and exit pupils.
 2. Solve problems involving chief and marginal rays through an optical system.
6. Solve problems involving matrix optics.
 1. Solve problems involving image formation.
 2. Solve problems involving laser resonator stability.
 3. Solve problems involving a sun-pumped laser system.
7. Investigate and solve problems using experimental techniques.
 1. Investigate and solve problems involving reflection.
 2. Investigate and solve problems involving refraction.
 3. Investigate and solve problems involving thin lenses.
 4. Investigate and solve problems involving thick lenses.
 5. Investigate and solve problems involving stops and apertures.
 6. Investigate and solve problems involving matrix optics.

Evaluation Criteria/Policies:

The grade will be determined using the Delaware Tech grading system:

90	-	100	=	A
80	-	89	=	B
70	-	79	=	C
0	-	69	=	F

Students should refer to the [Student Handbook - https://www.dtcc.edu/handbook](https://www.dtcc.edu/handbook) for information on the Academic Standing Policy, the Academic Integrity Policy, Student Rights and Responsibilities, and other policies relevant to their academic progress.

Core Curriculum Competencies (CCCs are the competencies every graduate will develop):

1. Apply clear and effective communication skills.
2. Use critical thinking to solve problems.
3. Collaborate to achieve a common goal.
4. Demonstrate professional and ethical conduct.
5. Use information literacy for effective vocational and/or academic research.
6. Apply quantitative reasoning and/or scientific inquiry to solve practical problems.

Program Graduate Competencies (PGCs are the competencies every graduate will develop specific to his or her major):

1. Set-up, conduct, and troubleshoot systems involving laser/optics applications.
2. Construct and test basic laser/optics subassemblies.
3. Perform maintenance and systems checks on laser/optics components/systems.

Disabilities Support Statement:

The College is committed to providing reasonable accommodations for students with disabilities. Students are encouraged to schedule an appointment with the campus Disabilities Support Counselor to request an accommodation needed due to a disability. A listing of campus Disabilities Support Counselors and contact information can be found at the [disabilities services - https://www.dtcc.edu/disabilitysupport](https://www.dtcc.edu/disabilitysupport) web page or visit the campus Advising Center.