

UNIVERSITY OF PORTLAND
Donald P. Shiley School of Engineering
EGR 491 Telescope Design, 2019

Course Description: The rapid learning cycle of engineering design will be applied in the design of amateur telescopes. Since consideration for user-needs is essential in design, this course will also study telescopic observations and basic astronomy.

Number of Credits: 3

Class Schedule: 9:45-11:10 TR

Course Instructor: Kenneth E. Lulay, Ph.D., P.E.
Shiley Hall 236. Ph: 943-7432. e-mail: lulay@up.edu
Web pages: <http://faculty.up.edu/lulay/>

Office Hours: Available any time if I'm in my office. I'll try to be in my office:

Monday	9:30-10:10
Tuesday	11:20-12:00
Wednesday	1:45-3:00
Thursday	1:00-3:00
Friday	1:00-2:00

Prerequisites: Must be ME, EE, CE, CS, or physics major

Texts: Several texts will be on reserve in the library.

Purpose: This course aims to address two of the four University Core Curriculum questions:

- *How does the world work? How could the world work better?*
- *What is the role of beauty, imagination, and feeling in life?*

Student Outcomes:

- Students shall demonstrate observational skills and a greater awareness of the world around them.
- Students demonstrate creative solutions to technical problems.
- Students shall apply rapid design process to designing and re-designing a telescope.

E-mail: Students are required to check their UP email accounts daily.

Policy on Late Assignments: All assignments are due at the beginning of class. Special circumstances may allow for exemptions. Discuss with instructor.

Policy on Exams: No makeup exams will be given. If you cannot attend an exam for a legitimate reason, please contact the instructor to arrange to take the exam in advance. Upon receiving your graded exam, you have the right to question the grading of your exam. You must provide a typed page addressing the specific issue in question and present this page along with your original exam to the instructor. You have one week from the day your exam is returned to question any grading decisions.

Tentative Lecture Schedule:

Topic

Course Introduction
Rapid Design Process
Economic factors
Observing
Common telescope designs
Design details – “Dobsonian” telescopes
Optics, Parts 1 and 2
Optics, Part 3
Magnification (point sources vs. extended objects)
Human eye
Telescope optical specifications
EM Spectra, Atomic Spectra
Observing: setup, collimating, star parties, preparation/planning, maps/charts, equipment, viewing (averted vision), comfort and safety items.
Star of Bethlehem

Grading:	Attendance	5%
	Midterm exam	10%
	Final exam	15%
	Team project	25%
	Weekly homework	20%
	<u>In-class presentations</u>	<u>25%</u>
	Total:	100%

MAKE attendance part of the grade

Better than 90%	A: Demonstrate deep understanding (could teach others)
Better than 80%	B: Demonstrate good understanding of most concepts (could explain it well to others).
Better than 70%	C: Demonstrates understanding of most concepts
Better than 60%	D: Not demonstrate understanding of many concepts
0%-60%	F: Not demonstrate understanding of most concepts

Attendance: attendance (including paying attention and respecting others while present) is mandatory in this course. Please let the instructor know in advance if you will need to miss class for a legitimate reason (health, job interviews, etc.). Course grade will be reduced by 1 percentage point per unexcused absence.

Team Project: there will be team projects in this course (2-4 students per team) involving the design of a telescope or related hardware/software. Details will be provided later.

Homework: There will be regular homework (near weekly). Grading will be based on completeness and demonstrated thought.

In-class presentations: each student will deliver approximately 2 presentations throughout the semester; each about 10-15 minutes in length. Grading will be based on educational effectiveness (how well you teach the class).

School of Engineering's Lab/Shop Access and Safety Policy: No one is allowed to work in the shops or labs without appropriate training from the shop technician and without instructor permission.

University Policies and Resources

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University of Portland's Code of Academic Integrity

Academic integrity is openness and honesty in all scholarly endeavors. The University of Portland is a scholarly community dedicated to the discovery, investigation, and dissemination of truth, and to the development of the whole person. Membership in this community is a privilege, requiring each person to practice academic integrity at its highest level, while expecting and promoting the same in others. Breaches of academic integrity will not be tolerated and will be addressed by the community with all due gravity.

Assessment Disclosure Statement

Student work products for this course may be used by the University for educational quality assurance purposes.

Accessibility Statement

The University of Portland endeavors to make its courses and services fully accessible to all students. Students are encouraged to discuss with their instructors what might be most helpful in enabling them to meet the learning goals of the course. Students who experience a disability are also encouraged to use the services of the Office for Accessible Education Services (AES), located in the Shepard Academic Resource Center (503-943-8985). If you have an AES Accommodation Plan, you should make an appointment to meet with your faculty member to discuss how to implement your plan in this class. Requests for alternate location for exams and/or extended exam time should, where possible, be made two weeks in advance of an exam, and must be made at least one week in advance of an exam. Also, you should meet with your faculty member to discuss emergency medical information or how best to ensure your safe evacuation from the building in case of fire or other emergency.

Mental Health Statement

As a college student, you may sometimes experience problems with your mental health that interfere with academic experiences and negatively impact daily life. If you or someone you know experiences mental health challenges at UP, please contact the University of Portland Health and Counseling Center in Orrico Hall (down the hill from Franz Hall and Mehling Hall) at www.up.edu/healthcenter or at 503-943-7134. Their services are free and confidential, and if necessary they can provide same day appointments. In addition, after-hours phone counseling is available if you call 503-943-7134 and press 3 outside of business hours. Also know that the University of Portland Public Safety Department (503-943-4444) has personnel trained to respond sensitively to mental health emergencies at all hours. Remember that getting help is a smart and courageous thing to do – for yourself, for those you care about, and for those who care about you.

Non-Violence Statement

The University of Portland is committed to fostering a community free from all forms of violence in which all members feel safe and respected. Violence of any kind, and in particular acts of power-based personal violence, are inconsistent with our mission. Together, we take a stand against violence. Join us in learning more about campus and community resources, UP's prevention strategy, and reporting options on the [Green Dot website, www.up.edu/greendot](http://www.up.edu/greendot) or the [Title IX website, www.up.edu/titleix](http://www.up.edu/titleix).

Ethics of Information

The University of Portland is a community dedicated to the investigation and discovery of processes for thinking ethically and encouraging the development of ethical reasoning in the formation of the whole person.

Using information ethically, as an element in open and honest scholarly endeavors, involves moral reasoning to determine the right way to access, create, distribute, and employ information including: considerations of intellectual property rights, fair use, information bias, censorship, and privacy. More information can be found in the Clark Library's guide to the [Ethical Use of Information](http://libguides.up.edu/ethicaluse) at libguides.up.edu/ethicaluse.

The Learning Commons

Trained peer tutors and writing assistants in the Learning Commons, located in Buckley Center 163, work with you to facilitate your active learning and mastery of skills and knowledge. For questions about the Learning Commons, please send all correspondence to Jeffrey White, Administrator, at white@up.edu. The Learning Commons is a program of the Shepard Academic Resource Center (SARC.)

Math Resource Center: Appointment-based tutoring is available through our online scheduler at www.bit.ly/up_mrc. Walk-in tutoring Sundays through Thursdays evenings. For MTH 141, request appointments at math141@up.edu. The course-specific schedule can be found at www.up.edu/learningcommons, or the reception desk in BC 163.

Writing Assistance: Brainstorming ideas for your paper, create an outline, work on citations, or review a draft with a Writing Assistant. Visit www.up.edu/learningcommons to access our Writing Center schedule.

The Language Studio: Contact the language assistance hotlines to schedule a time to meet throughout the semester at chinesetutor@up.edu, frenchtutor@up.edu, germantutor@up.edu, or spanishtutor@up.edu.

Natural Sciences Center: Send your tutoring requests to biotutor@up.edu, chemtutor@up.edu, or physicstutor@up.edu.

Speech & Presentation Lab: Improve your presentations by requesting an appointment at speech@up.edu.

Group Work Lab: Make an appointment for your group project at groupwork@up.edu.

Nursing Tutoring: Tutoring is available for pathophysiology, BIO205, anatomy and physiology, and other nursing courses on a walk-in or appointment basis. Up-to-date schedule information is at www.up.edu/learningcommons/nursing.

Economics and Business Tutoring: For support in economics, OTM, finance, accounting, and business law courses, send requests for appointments to your discipline's tutor email hotline: econtutor@up.edu, otmtutor@up.edu, financetutor@up.edu, accountingtutor@up.edu, or bizlaw@up.edu.

Shiley Sophomore Fellows: Provides tutoring in several sophomore engineering classes. To make an appointment, send a request to stepUP@up.edu.

Learning Assistance Counselor: Learning assistance counseling is also available in BC 163. The counselor teaches learning strategies and skills that enable students to become more successful in their studies and future professions. The counselor provides strategies to assist students with reading and comprehension, note-taking and study, time management, test-taking, and learning and remembering. Appointments can be made in the on-line scheduler available to all students in Moodle or during posted drop-in hours.