50:100:305 – Observational Astronomy

Instructor	Dr. Sean O'Malley	**E-mail**	omallese@camden.rutgers.edu
Phone	NA	**Office Hours**	By appointment (Canvas, WebEx, Zoom)
Office	CNS 216F	**Final Exam**	NA

Class time: There is no fixed meeting time. New course modules will be released each day (Monday through Thursday) for the 4-week period running from June 26th to July 20th, 2023.

The course is being taught asynchronously meaning that you do not need to log on at a particular time during the day. Simply complete that day's module during the 24hr period.

Class location: This is an online course that will be available on
https://canvas.rutgers.edu/

Text: The course does not have an assigned textbook. Each day there will be a new module which contains comprehensive lecture notes that I have created.

Supplemental texts: Here is a short list of books that I used to curate the material for the course. You do not need to purchase these books.

- "Explorations: Introduction to Astronomy by Thomas T. Arny and Stephen E. Schneider, ISBN 978-1-260-15051-3 (a very good introductory level text that covers observational techniques quite well but not in great detail; in print)
- "Observing the Universe" by Andrew J. Norton, ISBN 978-05-216-03935 (a good introductory text focused on visible light techniques but very limited in other areas of astronomy and observational techniques, out of print)
- "Astronomy Methods: A Physical Approach to Astronomical Observations" by Hale Bradt, ISBN 978-0-511-33698-0 (very good but advanced undergraduate / graduate level text that is specialized in observational techniques, assumes that you have had previous coursework in astronomy and physics; available free to Rutgers students through ProQuest)

Description:

This course is meant to serve as an introductory course in astronomy but with an emphasis on observational techniques. While the course will detail the operation of optical telescopes, we will also delve into non-optical instrumentation and techniques as well. The course will be given at a level suitable for both non-science majors, and science majors, who have not taken a prior course in astronomy. Note, you will be required to perform some basic math operations related to algebra and trigonometry.

Learning goals:
Upon completion of this course you (the student) should have acquired knowledge on the various types of astronomical objects, their orbital motion and their perceived motion in the sky, an understanding of the various forms of electromagnetic radiation, the function of various optical components found in telescopes, the operational principle of an optical telescope, an understanding of how characteristics of various astronomical objects are determined, and the purpose and function of non-optical telescopes.

Details:

1) Office hours are by arrangement. Just send me a request for a meeting, with your availability, and I will reply with a link using a platform such as WebEx or Zoom.
2) There are daily quizzes and occasional assignments that you are expected to complete by the indicated deadline. The point value per quiz or assignment will vary, *e.g.* Day #1 Quiz may contain 15 points while the quiz on Day #2 maybe contain 20 points. Course weights: **quizzes 45%**, **assignments 30%**
3) There are daily discussion questions which you are expected to participate in. Your response(s) in the discussions will not be graded in terms of correctness but if they are off target then you may not receive full credit for your participation. Also, some discussions may have the additional requirement of replying to a classmate's response for full credit. Course weight: **discussions 25%**

Note, based on the number of assignments in each category the final percentage distributions may be slightly different.

Grading:

A	90-100%	C	67-75%
B+	87-89%	D	55-66%
B	80-86%	F	<55%
C+	76-79%		

Instructor's Statement:
Do not engage in any form of academic dishonesty. If you do not know what academic dishonesty is, please consult this statement:
http://www.camden.rutgers.edu/RUCAM/info/Academic-Integrity-Policy.html.
I will report any violations of this policy to the campus Judicial Officer.

Modules will be released at midnight the day of and all work must be submitted before midnight the next day. For example, a module released at 12:00am Monday must have the associated course work completed by 11:59pm Monday. Modules will not be released ahead of time.

You are responsible for the stability and functionality of your computer and your internet access.

Even though this is an online assignment if you have to miss a day due to illness, or a different circumstance, you must self-report the absence using the following link: https://sims.rutgers.edu/ssra/

While you may use lecture notes, books, and online resources that are focused on disseminating knowledge (*e.g.* Wikipedia), to complete the course work, this work is expected to be your own. For example, the sharing of answers/work among classmates would be considered cheating. Also, the use of tutoring resources that complete the work for you would be considered a form of cheating.

Class Outline:

1) Tour of the Universe
2) The Scale of Things & Gravity
3) A Brief History of Astronomy & The Earth – Sun System
4) The Earth – Sun System Cont., Sundials, and Leap Years
5) The Moon
6) Coordinate Systems & Constellations
7) Kepler's Laws and Electromagnetic Radiation
8) Distance, Size, and Mass Determination
9) Optics and Telescopes
10) Telescopes Continued
11) The Human Eye & Camera Technology
12) Spectrometers, Blackbody Radiation, Spectral Lines
13) Non-Optical Telescopes
14) Stellar Evolution
15) Stellar Evolution Cont. & Blackholes
16) Pulsars, Mergers, and Gravitational Waves