

This syllabus was last updated on **August 09, 2024**

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**Bulletin Description:** Qualitative survey of the current understanding of the universe including planetary explorations, solar phenomena, stars, black holes, nebulae, galaxies.

This course has been approved for the General Education category PHYSICAL SCIENCE (SP) category. Students will analyze components and dynamics of natural and physical worlds, develop models to explain phenomena within the natural and physical worlds, and apply methods of scientific inquiry to enhance their understanding of the natural and physical world.

**Objectives:** The goal of this course is to provide students with the knowledge and understanding of basic principles of Astronomy. This includes historic aspects of astronomy, experimental methods, physical laws used to rationalize experimental observations, components and the structure of the universe on different scales, as well as their evolution in space and time. The course creates opportunities to explore and appreciate what humans know about our universe as well as current frontiers of human knowledge. The focus of the course on understanding and critical evaluation of current knowledge contributes to becoming a scientifically literate and technologically informed member of society.

**Prerequisites:** High-school algebra

**Meetings: Tuesday and Thursday 2:00pm-3:15pm** in *NDSU A.G.Hill building, Rm 112*. This is an in-person course. Class meetings may be recorded and made available through Lon-Capa.

**Office hours:** Mon 10am-11am and Fri 11am-12pm in South Engineering room 216A; additional zoom or face-to-face options may be specified during the course.

**Textbook:** Michael Seeds and Dana Backman, *Astro: Introductory Astronomy*, 3rd edition, Cengage Learning, 2017

**Topic Outline and Timing:** The chapters in the textbook to be discussed in this course are listed below, along with the tentative exam dates.

Chapter 1:	Here and Now	(Tue 08/27 & Thu 08/29)
	<b>Practice Exam: Thu 09/05</b> (2-2:20pm)	
Chapter 2:	User's Guide to the Sky: Patterns and Cycles	(Tue 09/03 & Thu 09/05 & Tue 09/10)
	<b>Exam 1 (Ch. 1-2): Thu 09/12</b> (2-2:20pm)	
Chapter 3:	The Origin of Modern Astronomy	(Thu 09/12 & Tue 09/17)
Chapter 4:	Light and Telescopes	(Thu 09/19 & Tue 09/24)
	<b>Exam 2 (Ch. 3-4): Thu 09/26</b> (2-2:20pm)	
Chapter 5:	Sun Light and Sun Atoms	(Thu 09/26 & Tue 10/01)
Chapter 6:	The Terrestrial Planets	(Thu 10/03 & Tue 10/08)
	<b>Exam 3 (Ch. 5-6): Thu 10/10</b> (2-2:20pm)	
Chapter 7:	The Outer Solar System	(Thu 10/10 & Tue 10/15)
Chapter 8:	Origin of the Solar System and Extrasolar Planets	(Thu 10/17 & Tue 10/22)
	<b>Exam 4 (Ch. 7-8): Thu 10/24</b> (2-2:20pm)	
Chapter 9:	The Family of Stars	(Thu 10/24 & Tue 10/29)
Chapter 10:	Structure and Formation of Stars	(Thu 10/31 & Tue 11/05)
	<b>Exam 5 (Ch. 9-10): Thu 11/07</b> (2-2:20pm)	
Chapter 11:	The Deaths of Stars	(Thu 11/07 & Tue 11/12)
Chapter 12:	The Milky Way Galaxy	(Thu 11/14 & Tue 11/19)
	<b>Exam 6 (Ch. 11-12): Thu 11/21</b> (2-2:20pm)	
Chapter 13:	Galaxies: Normal and Active	(Thu 11/21 & Tue 11/26)
Chapter 14:	Modern Cosmology	(Tue 12/03 & Thu 12/05)
	<b>Exam 7 (Ch. 13-14): Thu 12/05</b> (2-2:20pm)	
Chapter 15:	Life on Other Worlds	(Tue 12/10 & Thu 12/12)
	<b>Exam 8 (comprehensive Final Exam: Mon 12/16)</b> (1-3pm)	

**Format:** In-class activities involve some traditional lecture plus discussions with a focus on critical thinking and problem solving. Paper flash cards may be distributed and used. Students are encouraged to engage in in-class discussions and ask questions at any time during or after class. Class announcements will be made through email. Students demonstrate their level of comprehension in LON-CAPA homework and exams.

**How to succeed:** Attending class, reviewing lecture notes, reading the textbook, taking part in class activities and discussions, and completing homework problems are keys to success. Each student is encouraged to contact the instructor with any concerns, questions, and suggestions. If desired, additional review sessions will be offered at any time during the course, especially prior to exams.

**LON-CAPA:** This course does not use Blackboard. Instead, the LON-CAPA course management system will be used to post homework, lecture notes, grades, and other information. LON-CAPA can be accessed by selecting the appropriate server at [http://www.ndsu.edu/physics/lon\\_capa/](http://www.ndsu.edu/physics/lon_capa/). Your username is everything to the left of the @ in your NDSU email address (use all lowercase letters). For example, if your email address is Sheldon.Cooper.2@ndsu.edu, then your LON-CAPA username is sheldon.cooper.2. Initially you create your own password by following the link “Forgot Password”. For help using LON-CAPA contact your instructor or laboratory technician Paul Omernik (SE110, Paul.Omernik@ndsu.edu, 231-7047). Technology concerns other than Lon-Capa can be addressed to IT Help Desk; Email: ndsu.helpdesk@ndsu.edu, Call: 701-231-8685 (option 1)

**Homework:** 8 homework problem sets, each containing 10 problems as specified in the table below, will be assigned via the LON-CAPA online system. The total number of available problems is 150.

set number	1	2	3	4	5	6	7	8
chapter numbers	1,2	3,4	5,6	7,8	9,10	11,12	13,14	15
number of problems	20	20	20	20	20	20	20	10
due date	09/15	09/29	10/13	10/27	11/10	11/24	12/08	12/15

Each correctly solved problem earns 1 point. To get full credit, 120 points must be earned. The solved problems can come from any of the chapters and can be solved as long as the problems are available (until the due date). You may work together on homework sets, but simply copying another’s answers is neither recommended nor beneficial. No late homework will be accepted.

**Essay Questions:** Three essay questions will be asked (due 9/29, 10/27, 12/08). Each discusses an interesting subject using 300-500 words, yielding up to 10 points. Interested students may present their answers to the class. Only two of the three questions count toward the final grade, one can be dropped. Hence, the total number of available points from the essay questions is 20.

**Exams:** 8 exams (including the final) will be administered. For each exam (including the final), 5 questions need to be solved within 20 minutes. Each exam covers the material as specified on the preceding page. Each correctly solved problem earns 2 points. The two lowest-scoring exams will be dropped. The other 6 exams will count towards the final score. The maximal number of available points from the exams is thus 60.

All exams are “open notes”. Notes include the textbook and all course material in Lon-Capa. Using computers to access notes is permitted during an exam. Communicating with others and making use of external help (including AI agents and tutoring services) is not permitted. Students bring a device (computer, laptop, even a cell phone may work) that allows them to access and answer the exam questions through Lon-Capa during exam time. Scantrons will not be used. No makeup exams will be scheduled.

**Grading:** Grading will be based on LON-CAPA homework score (max. 120 points), 6 exams (max. 60 points), and 2 essay questions (max. 20 points). From the actual number of points and the maximal number ( $120 + 60 + 20 = 200$  points) the percentage will be calculated and used to grade according to: 90.0% -100% A, 80.0% - 90.0% B, 70.0% - 80.0% C, 60.0% - 70.0% D, 0% - 60.0% F. Expressed in points, this corresponds to: 180 - 200 A, 160 - 179 B, 140 - 159 C, 120 - 139 D, 0 - 119 F. The instructor reserves the right to lower the grade cutoffs in response to class performance, but they will not be raised.

#### **Additional Information:**

- Any students with disabilities or other special needs, who need special accommodations in this course, are invited to share these concerns or requests with the instructor and contact the Disability Services Office ([www.ndsu.edu/disabilityservices](http://www.ndsu.edu/disabilityservices)) as soon as possible.
- The academic community is operated on the basis of honesty, integrity, and fair play. NDSU Policy 335: Code of Academic Responsibility and Conduct applies to cases in which cheating, plagiarism, or other academic misconduct have occurred in an instructional context. Students found guilty of academic misconduct are subject to penalties, up to and possibly including suspension and/or expulsion. Student academic misconduct records are maintained by the Office of Registration and Records. Informational resources about academic honesty for students and instructional staff members can be found at [www.ndsu.edu/academichonesty](http://www.ndsu.edu/academichonesty).
- Your personally identifiable information and educational records as they relate to this course are subject to FERPA.
- According to NDSU Policy 331.1 (PDF download: <https://www.ndsu.edu/fileadmin/policy/333.pdf>) attendance is expected.