

# Introductory Astronomy of the Solar System

## Physics 103N/126N

Welcome to “Introductory Astronomy of the Solar System” at Old Dominion University. This four credit-hour course introduces the basic concepts of astronomy with emphasis on the solar system.

Students will learn basic techniques of scientific investigation of objects in our solar system and their underlying physical principles. Emphasis is on how we acquire knowledge of celestial objects to develop models of our universe through a combination of instruction, in class participation, performing laboratory work and possibly night observations, reading and solving homework problems.

The course consists of two weekly lectures with regular quizzes, one weekly laboratory session, homework assignments, two midterm exams and one cumulative final exam.

<b>The catalog description</b>	PHYS 103N. Introductory Astronomy of the Solar System. 4 Credits. “A study of the physical principles and scientific investigation of objects in our solar system. Emphasis on how we acquire knowledge of celestial objects to develop models of our universe.
<b>Classes</b>	Tuesday and Thursday 13:30 – 14:45 in Mills Godwin Hall 0102
<b>Instructor</b>	Dr. Alexander L. Godunov Office: OCNPS 0219 (Oceanography and Physics) Phone: 683-5805 agodunov@odu.edu Web: <a href="http://www.odu.edu/~agodunov">www.odu.edu/~agodunov</a>
<b>Materials</b>	<ol style="list-style-type: none"><li>Textbook (<u>highly recommended</u>): “21st Century Astronomy: The Solar System” (5<sup>th</sup> Edition) by Laura Kay et al (Norton &amp; Company) (more info in Appendix I) Note 1: Students can use 4th edition of the same textbook Note 2: Students planning to take also PHYS 104N can alternatively buy the full two-volume (two semester) edition: 21st Century Astronomy by L. Kay et al</li><li>Sapling Learning (<u>required</u>) for online assignments: <a href="https://www.saplinglearning.com/ibiscms/login/">https://www.saplinglearning.com/ibiscms/login/</a> The class name is Old Dominion University - PHYS 103N - Fall17 - GODUNOV</li></ol>
<b>Support resources</b>	<p><u>Blackboard</u>: Majority of information, including lecture notes, will be posted on the class Blackboard page.</p> <p><u>Office hours</u>: Thursdays 11:00 – 12:00 (in my office - OCNPS 219), then 15:00 – 16:00 (Physics Learning Center), and by appointment.</p> <p><u>Physics learning center</u>: A place where students in any introductory physics course can receive help. The center is staffed by physics faculty and TAs (2<sup>nd</sup> Floor Atrium, Physical Sciences Building), <a href="https://www.odu.edu/physics/resources/learning-center">https://www.odu.edu/physics/resources/learning-center</a></p> <p><u>E-mail</u>: <a href="mailto:agodunov@odu.edu">agodunov@odu.edu</a> (with “Astronomy I” in the subject line).</p> <p><u>Phone</u>: 683-5805 (feel free to contact the instructor for any urgent questions).</p>
<b>Class time and attendance</b>	Attendance is highly recommended. If you missed a class, it is your responsibility to find out what you missed.

<b>Course Grades</b>	<p>The final grade is calculated on an absolute scale. There are 100 points possible for this course of which</p> <p>25 points – Final Exam  40 points – Two Midterm Exams (20+20=40)  10 points – Homework assignments  15 points – Labs (You must receive a passing grade to pass the course).  10 points – Quizzes</p> <p>The grading policy is non-competitive and lenient, but there will be <b>no curve</b>. If everyone in the class does well, everyone can get an A.  A letter grade is determined only at the end of the term.</p> <p>Grade Requirements (breakpoints)</p> <p>93 ≤ A &lt; 100    88 ≤ A- &lt; 93    83 ≤ B+ &lt; 88  77 ≤ B &lt; 83    72 ≤ B- &lt; 77    66 ≤ C+ &lt; 72  60 ≤ C &lt; 66    55 ≤ C- &lt; 60    50 ≤ D &lt; 55    F &lt; 50</p>
<b>Homework assignments</b>	<p>The homework is to be submitted via the web using Sapling Learning. The class ID is <b>PHYS 103N - Fall17 - GODUNOV</b>.</p> <p>You need to create an account on Sapling Learning The enrollment period begins two weeks before classes begin. The cost is \$40 for one semester, with a grace period by the publisher for payment of two weeks. There is a two-semester option for \$60. Homework will be assigned as the course progresses, typically once a week. Here is a direct link to the course page: <a href="#">Old Dominion University - PHYS 103N - Fall17 - GODUNOV</a></p> <p>Doing the homework problems is one of the best ways to learn the material. Credit for homework is given to encourage practicing and thinking about astronomy on a regular basis. You should start homework early and get help if needed before the due date. No individual extensions of assignment submission dates will be given.</p>
<b>Reading Assignments</b>	<p>It is VITALLY IMPORTANT that you read the appropriate sections of the textbook BEFORE coming to class. Reading ahead requires time management and discipline, but the payoff is considerable - the material will be much easier to understand. You should spend at least 1 hour each class day reading your text book.</p>
<b>Laboratory</b>	<p>Attendance &amp; participation is required in the laboratory sessions of the course. Any student with more than one missed lab session will fail the laboratory part of the course and, hence, the entire course. An excused absence from a lab session can be made up during makeup lab session weeks or by participating at a different lab session during the same week. You must get permission from your lab instructor. If you cannot avoid missing a lab session, contact the instructor in advance. You must hand in a lab report to get credit for each session. The lab instructor will detail the format of lab reports and the grading criteria to be applied. Night observations may be scheduled.</p> <p><i>Note: It is a College of Sciences regulation, that you must receive a passing grade (C- or better) from your lab instructor to pass the course.</i></p>

<b>Mid-term exams</b>	<p>There will be two midterm exams. The midterm examinations will be given during the regularly scheduled class periods.</p> <p>Tentative exam dates: October 3<sup>rd</sup> and November 9<sup>th</sup>. (These dates are subject of weather conditions and a function of our progress through the course). All the exams will be closed book. The examinations will emphasize the material in lectures and homework assignments. Some material covered in class may be omitted.</p> <p>No make-up examinations will be given. In case you have a legitimate reason for missing an exam, consult with me before, or at least within 24 hours after the exam. If you miss a midterm examination for an officially excused reason (documented illness or family emergency, major religious holidays, or official university business) your missed examination score will be replaced with the appropriately scaled score on the portion of the final exam that covers same material as the missed midterm examination.</p> <p>Requests for correction of grading mistakes on exams can be made when the work is returned to you. The requests must be made within two days after getting your grade. Requests should be written. In their request, students must explain why they believe there is a mistake in grading and why they deserve more credit. However, clerical errors (e.g., addition errors) will be corrected immediately.</p>
<b>Quizzes</b>	<p>Short quizzes will be given during regular class time There are no make-ups for the quizzes but the lowest quiz grade will be dropped</p>
<b>Final Exam</b>	<p>December 12<sup>th</sup> (Tuesday), 12:30 – 15:30. Place: Mills Godwin Hall 0102 The final exam is comprehensive covering all chapters. Note: There will be no early exams</p>
<b>Professional Integrity</b>	<p>In Physics 103, high professional and ethical standards are promoted. Plagiarism and cheating are serious offenses and may be punished by failure on the exam and failure in the course. The academic integrity code is to be maintained at all times. Using Google, Chegg, and similar resources for getting solutions to homework problems is considered as cheating.</p>
<b>Collaboration</b>	<p>Collaboration in class is strongly encouraged. Because the course is graded on an absolute scale, you will never reduce your grade by helping others — on the contrary, by doing so you will reinforce your own knowledge and improve your performance. Although, before working together or consulting others on any assignments, it is helpful to first tackle the work alone.</p> <p>Activities for which collaboration is not permitted are: examinations and submission of homework assignments.</p>
<b>Accommodation</b>	<p>Students are encouraged to self-disclose disabilities that have been verified by the Office of Educational Accessibility by providing Accommodation Letters to their instructors early in the semester in order to start receiving accommodations. Accommodations will not be made until the Accommodation Letters are provided to instructors each semester.</p>

## Course Outline

### Chapters and Subjects

Chapter 1. Thinking Like an Astronomer

Chapter 2. Patterns in the Sky—Motions of Earth and the Moon

Chapter 3. Motion of Astronomical Bodies

Chapter 4. Gravity and Orbits

Chapter 5. Light

Chapter 6. The Tools of the Astronomer

Chapter 7. The Birth and Evolution of Planetary Systems

Chapter 8. The Terrestrial Planets and Earth's Moon

Chapter 9. Atmospheres of the Terrestrial Planets

Chapter 10. Worlds of Gas and Liquid—The Giant Planets

Chapter 11. Planetary Moons and Rings

Chapter 12. Dwarf Planets and Small Solar System Bodies

Chapter 14. Our Star—The Sun (\*)

Chapter 24. Life

(\*) If we get that far

**Appendix I**The textbook

The course follows basically the contents of the below textbook. Older editions may also be suitable.

- 21st Century Astronomy: The Solar System by L. Kay, S. Palen, G. Blumenthal, 5th edition, W. W. Norton

Students planning to take also PHYS 104N can alternatively buy the full two-volume (two semester) edition:

- 21st Century Astronomy by L. Kay, S. Palen, G. Blumenthal, 5th edition, W. W. Norton 2016

Some students might prefer a different textbook, some listed below. Again, older editions may be suitable.

- The Cosmic Perspective: The Solar System by J. Bennett, M. Donahue, N. Schneider, M. Voit, 8th edition, Addison-Wesley 2016
- Universe by R. A. Freedman, R. Geller, W. J. Kaufmann, 10th edition, W. H. Freeman 2015

Below are less thorough (shortened) one-semester course textbooks:

- Understanding Our Universe by S. Palen, L. Kay, B. Smith, G. Blumenthal, 2nd edition, W. W. Norton 2014.
- Life in the Universe by J. Bennett, S. Shostak, 3rd edition, Addison-Wesley 2012.
- Discovering the Universe by N. F. Comins, W. J. Kaufmann, 10th edition, W. H. Freeman 2014.