

AST 2103: HOW OLD IS THE UNIVERSE
Mendel Hall 341
Tue 10:00-11:15, Thr 10:00-11:15

Spring 2019 Syllabus

Instructor: Dr Andrej Prša, assoc. prof.
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OFFICE HOURS

Tue 2pm – 4pm
Wed 10am – noon
Thr 2pm – 4pm
other times by appointment

Course homepage:

<http://aprsa.villanova.edu/?q=hoitu>

Course description:

Today we *know*, rather than guess, that the age of the Universe is 13.7 billion years. The uncertainty in this number is remarkably small, smaller than 1%. It is of course natural to ask ourselves: how do we know? What observations, what reasoning and what inevitable conclusions shaped this bold statement and shrunk the corresponding uncertainties? Join me for a ride of epic proportions, where we will jointly endeavor to understand the steady advancement of comprehending our Universe, starting from our home turf, the Earth, then shooting for the stars, and finally discussing the mind-boggling concepts of dark matter and dark energy! We will leave the comfort of this world and strive to understand the physical laws that govern the largest scale dynamics – galaxies and clusters of galaxies – and tie it all to form a consistent picture that answers our question: how old is the Universe? Since the path to get there is much more rewarding than the answer itself, brace yourselves for a thought-provoking semester filled with unexpected twists, turns and new information that will enrich and empower you in the modern world today where science shapes the advancement of our civilization.

Course objectives:

Once you have successfully completed the *How Old is the Universe* course, you will be able to:

- understand and appreciate the process of scientific discovery, from hypothesis to theory;
- educate and partake in a scientifically backed discussion on the age of the Universe;
- have the foundation for reading and following the news and advances from this field;
- gain proficiency with the basic astronomical vocabulary to propel you to other related field;
- gain independence and critical thinking to assess reasonableness of information content.

Course material:

- **D. Weintraub: *How Old is the Universe, 3rd Ed.*** (Princeton UP, 2013; ISBN 9780691156286)
- Presentation slides, essays, web pages and video clips on the course homepage

Course work and grading:

Your final grade will reflect your effort, quizzes, tests and the final. For the course you are required to do the following:

- every week (Tuesday – but that's up for discussion) there will be an in-class quiz that is obligatory for everyone. Every quiz has 10 questions, with additional two questions for extra credit. Each quiz question is worth 5 points, 50 points total + 10 points for extra credit;

- there will be 2 75-min tests during the semester. These tests will have 5 questions, with an additional question for extra credit. Each question is worth 100 points, 500 points total + 100 points for extra credit;
- at the end of semester there will be a **cumulative** final. The final will have 5 questions, with an additional question for extra credit. Each question is worth 100 points, 500 points total + 100 points for extra credit;
- occasionally there will be other opportunities given for extra credit, such as an in-depth presentation of research topics and homeworks. Priority will be given to students who demonstrated genuine interest and contribute to in-class discussion. Please see me to find out more about these opportunities.

If you do the math, you will see that quizzes, tests and the final account for 1/3 of your grade. The grading will be done according to the following breakdown:

0-56%	F	68-72%	C-	84-88%	B
56-60%	D-	72-76%	C	88-92%	B+
60-64%	D	76-80%	C+	92-96%	A-
64-68%	D+	80-84%	B-	96-100%	A

Yes, looks scary. But remember: work hard, work constantly, seize the extra credit opportunities, and there should be no reason for alarm. Ultimately, the grade you earn is yours alone, I am just a scribe.

Attendance and the Use of electronics:

Regular attendance is essential for uninterrupted understanding of course material. Since this course covers a significant amount of content in a not-so-significant amount of time, each missed class will hurt. Really hurt. The topic is not trivial and continuous work is required to remain on top of things.

Please do not miss quizzes and tests. If you must miss a quiz or a test, you must inform me of that in advance, and you must have a written notice excusing your absence. Provided that you follow these rules, I will excuse you from a missed quiz (i.e. there are no makeups for the quizzes), and I will provide you with a makeup opportunity for the test. Verbal excuses and call-the-health-center-and-you'll-see-I-was-sick-on-the-day-of-the-quiz/test are not admissible. There will be no exceptions.

The use of notebook computers, tablets or cell phones in class is strictly prohibited. You will be publicly flogged if caught using cell phones in class for texting, facebooking or web surfing.

Academic integrity:

Finally, here goes the standard blurb: any violation of the Code of ethics will be grounds for failing the course. Any cheating, copying, duplication of work, etc, will result in a 0 for that assignment. A repeated offense will cause you to fail the entire class. If you have any concerns, come talk to me in due time and we will figure it all out.

Special needs:

It is the policy of Villanova University to make reasonable academic accommodations for qualified individuals with special needs. If you are a person with a special need please contact me after class or during office hours and make arrangements to register with the Learning Support Office by contacting 610-519-5176 or at learning.support.services@villanova.edu as soon as possible. Registration is needed in order to receive accommodations.