AST 4122: UNDERGRADUATE RESEARCH 2 **Vintage: Fall 2021**

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OFFICE HOURS

Mon 9am – 11am
Wed 9am – 11am
Fri 9am – 11am

other times by appointment

In this class we value each person as part of a learning community for their insights, perspectives and opinions, irrespective of gender, gender identity, race, sexual orientation, disability, spiritual values, political beliefs or nationality. We celebrate diversity and highlight its principal role in enriching our academic, professional and personal lives.

Course time and location: Tue/Thu 2:30-3:45, M455a (4th floor Mendel)

Course homepage: http://aprsa.villanova.edu/?q=ur2

Please refer to the webpage above for most up-to-date information on the course.

Course content in a nutshell:

Undergraduate research is one of the signatures of Villanova's Astronomy curriculum. It aims to give you a taste of real-life academia. Dr. Guinan already exposed you to research in AST 4121, and you have undoubtedly had at least some summer research experience here at Villanova, elsewhere, or both. In this class we build on everything you already learned and know about research, and we will use it to tackle a specific problem in modern astrophysics. Everyone will be required to work on their own, independent project, that is not a continuation of summer research or a previous project. Our goal will be to go through all the motions of actual research, from initial concept to project execution.

Know your professor:

Who am I and why I might be qualified to teach this course? I am a professor of Astrophysics, with ~20 years of professional experience teaching and doing research in the fields of computational astrophysics, stellar physics and exoplanetary astronomy. I am a member of the *Kepler* Science Working Group – a NASA mission dedicated to discovering planets around other stars. I am also involved in the Transiting Exoplanet Survey Satellite (*TESS*), galactic astrometry mission *Gaia*, and the Large Synoptic Survey Telescope (*LSST*). I hail from Slovenia, a small Alpine country in Europe. When teaching, I put foremost emphasis on critical thinking and causal deductive reasoning.

Course work:

This is a tentative week-by-week breakdown of the course work:

Week 1 (Aug 24): Introduction, initial concept study
Week 2 (Aug 31): Initial concept study, literature review
Week 3 (Sep 7): Literature review continued, proposal writing
Week 4 (Sep 14): Proposals due, proposal peer-review
Week 5 (Sep 21): Proposal evaluation; work on the Introduction paper section
Week 6 (Sep 28): Introduction paper section due; observations/methodology development
Week 7 (Oct 5): Observations/methodology development continued
Week 8 (Oct 12): Fall break
Week 9 (Oct 19): Observations/methodology development continued
Week 10 (Oct 26): Observations/methodology paper section due; independent research
Week 11 (Nov 2): Independent research continued
Week 12 (Nov 9): Independent research paper section due; work on discussion/conclusions
Week 13 (Nov 16): Discussion/conclusions paper section due; peer-review of papers
Week 14 (Nov 23): Peer-review results; working on corrections
Week 15 (Nov 30): Final papers due, paper presentations, 15 min + 5 min for questions

Your final grade will reflect your success in meeting the deadlines and doing quality work.

- Project proposal carries 250 points, or 25% of the grade
- Project paper carries 500 points, or 50% of the grade
- Project presentation carries 250 points, or 25% of the grade
- Each day after the missed deadline will cost you 25 points.
- If your results are submitted to a peer-review journal, I will award you a bonus 250 points.

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

Attendance:

I will never insist on your presence in lecture, be it in person or remotely. There will be no attendance sheets and no penalties for missing the lecture. You never need to provide me with any evidence for missing any lectures. You are all adults and I will treat you as such. You take full responsibility for your actions.

That said… 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 topics are not trivial and continuous work is required to remain on top of things.

The use of masks in class:

Given the current pandemic situation, we will follow the guidelines and recommendations of the CDC. At the time of this writing, CDC recommends that all people, regardless of vaccination status, wear a mask in public indoor settings in areas of substantial or high transmission.

Academic integrity and Special needs:

Finally, here goes the standard fineprint: any violation of the Code of ethics will be grounds for failing the course. Any cheating, copying, duplication of work, etc, will get you into trouble. If you have any concerns, come talk to me and we will figure it all out.

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 Services by contacting 610-519-5176 or by emailing learning.support.services@villanova.edu. as soon as possible. Students approved for accommodations should use ClockWork to register and book tests.

Epilogue:

Please remember that the syllabus is a formal contract between you (the student) and me (the professor). I will give it my all to help you succeed, but you need to do the work. Please do not wait until it is too late to address any issues. Be proactive, work hard, and make this a truly fun learning experience!