

AST 375: Exploring the Physics of the Universe with White Dwarf Stars
Fall 2020, unique # 46600

Class Meets: F 2 - 3pm, possibly in WEL 2.310, but mostly online: <https://utexas.zoom.us/j/98683008631>

Computer Lab: PMA 15.201

Research Educator: Mike Montgomery (“Mike”)

Office: PMA 16.230

Email: mikemon@astro.as.utexas.edu

Phone: (512) 471-3451

TA: Zach Vanderbosch (“Zach”)

Office: PMA 16.220

Email: zvanderbosch@astro.as.utexas.edu

Phone: (512) 471-3447

Faculty Stream Leader: Don Winget (“Don”)

Office: PMA 16.236

Email: dew@astro.as.utexas.edu

Phone: (512) 471-3404

Mentors:

Joseph Guidry (jguidry330@gmail.com), Inan Sinha (inan.sinha@utexas.edu), Pranav Premnath (pranavp25@utexas.edu), Rian Robison (rianrobison@utexas.edu), Prateek Bardhan (prateekbardhan@utexas.edu), Ilyse Clark (ilyseclark@gmail.com), Aryn Feldner (aryn.feldner@gmail.com)

Course Description

University Catalog Course Description: Designed for science and engineering majors. Prerequisite: Consent of instructor or adviser. May be counted toward the independent inquiry flag requirement. Additional hour(s) to be arranged. Course number may be repeated for credit when the topics vary. Restricted to students in the Freshman Research Initiative.

What will I learn?

Main skills and attitudes to be developed:

- Critical reading of scientific texts
- Programming (in Python)
- How to conduct independent research
- Presentation of results

Learning Outcomes

1. Ability to organize and follow through on a research project
2. Increased proficiency in programming
3. Greater confidence in making presentations

How will I learn?

This course is a continuation of the FRI Astronomy Stream from the Spring. Since the introductory labs have been completed, this course will mainly focus on doing an independent research project. There will be a one-hour lecture per week as well as a computer time spent working on the research project. There will also be weekly readings in the book “Unlocking the Secrets of White Dwarf Stars” with a short online quiz over the readings. Finally, we/you may watch 2 or 3 of the “Feynman lectures” and discuss them as part of this course.

Pre-requisites for the course: The first semester of this FRI stream.

How to succeed in this course:

Since research is, by its very nature, open-ended, you will not be graded on whether you have “finished” or “completed” your project, although that is always the goal. Rather, you will be evaluated on the level of effort and ingenuity that you exhibit as you try to overcome the problems that invariably arise in research. Research takes time and can’t be rushed in the same way that you can cram for a test the night before.

Course Requirements

Required Materials

1. Text: Unlocking the Secrets of White Dwarf Stars, by Hugh Van Horn, ISBN: 3319093681 (please order now, e.g., <https://www.amazon.com/Unlocking-Secrets-White-Astronomers-Universe/dp/3319093681>, \$33.99 new)
2. A digital lab notebook that you create on Google and share with us.

Classroom expectations

Class attendance

You are expected to attend the weekly 1-hour online lecture of this course.

Class participation

You are expected to interact and participate during class and (of course!) during the group research meeting times!

Grading for this Course

The table below describes the various contributions of the different parts of this course to your total grade:

Weekly lecture meetings	Attendance	5%
	Discussion/participation	5%
Lab notebook	Notes and data	10%
Textbook	Readings and Quizes	15%
Feynman lectures	Viewings and Quizes	5%
Attend and report on a research seminar	Seminar report	10%
Research commitment, progress, and understanding	Hours	10%
	Progress	5%
	Understanding	5%
Final report/presentation	Powerpoint slides	15%
	Presentation	15%
Total		100%

Course Outline

All instructions, assignments, readings, rubrics and essential information will be on the Canvas website at <https://utexas.instructure.com>. Check this site regularly and use it to ask questions about the course schedule.

As part of this class you are required to **attend a research seminar or colloquium** during this semester and **write a half-page summary** of it. This will be due on the last class day, Dec. 4th.

The current schedule has the readings and their associated quizzes starting in one week, and following this approximate schedule:

1. Quiz for Chapters 1 and 2. Due Sep. 4th
2. Quiz for Chapters 3 and 4. Due Sep. 11th
3. Quiz for Chapters 5 and 6. Due Sep. 18th
4. Quiz for Chapters 7 and 8. Due Sep. 25th
5. Quiz for Chapters 10 and 11. Due Oct. 2nd
6. Quiz for Chapters 12 and 13. Due Oct. 9th
7. Quiz for Chapters 14 and 15. Due Oct. 16th
8. Quiz for Chapters 17 and 18. Due Oct. 23rd
9. Quiz for Chapters 21 and 22. Due Oct. 30th

The last day of this class is **Dec. 4th**.

Policies

Classroom Policies

Grading Scale

Grade	Cutoff
A	>92%
A-	90-92%
B+	87-89%
B	83-86%
B-	80-82%
C+	77-79%
C	73-76%
C-	70-72%
D	60-69%
F	<60%

Late work

Late work will be handled on a case-by-case basis. Unless arrangements were made in advance, you will most likely lose points.

Absences

Class attendance is 5% of your grade. You will start to lose points after your second absence.

Student Rights & Responsibilities

- You have a right to a learning environment that supports mental and physical wellness.
- You have a right to respect.
- You have a right to be assessed and graded fairly.
- You have a right to freedom of opinion and expression.
- You have a right to privacy and confidentiality.
- You have a right to meaningful and equal participation, to self-organize groups to improve your learning environment.
- You have a right to learn in an environment that is welcoming to all people. No student shall be isolated, excluded or diminished in any way.

With these rights come responsibilities:

- You are responsible for taking care of yourself, managing your time, and communicating with the teaching team and with others if things start to feel out of control or overwhelming.
- You are responsible for acting in a way that is worthy of respect and always respectful of others. • Your experience with this course is directly related to the quality of the energy that you bring to it, and your energy shapes the quality of your peers' experiences.
- You are responsible for creating an inclusive environment and for speaking up when someone is excluded.
- You are responsible for holding yourself accountable to these standards, holding each other to these standards, and holding the teaching team accountable as well.

Personal Pronoun Preference

Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender, gender variance, and nationalities. Class rosters are provided to the instructor with the student's legal name, unless they have added a "preferred name" with the Gender and Sexuality Center (<http://diversity.utexas.edu/genderandsexuality/publications-and-resources/>). I will gladly honor your request to address you by a name that is different from what appears on the official roster, and by the gender pronouns you use (she/he/they/ze, etc). Please advise me of any changes early in the semester so that I may make appropriate updates to my records. For instructions on how to add your pronouns to Canvas, visit <https://utexas.instructure.com/courses/633028/pages/profile-pronouns>.

University Policies

Academic Integrity

Each student in the course is expected to abide by the University of Texas Honor Code: **"As a student of The University of Texas at Austin, I shall abide by the core values of the University and uphold academic integrity."** **Plagiarism is taken very seriously at UT.** Therefore, if you use words or ideas that are not your own (or that you have used in previous class), you must cite your sources. Otherwise you will be guilty of plagiarism and subject to academic disciplinary action, including failure of the course. You are responsible for understanding UT's Academic Honesty and the University Honor Code which can be found at the following web address: http://deanofstudents.utexas.edu/sjs/acint_student.php

Q Drop Policy

If you want to drop a class after the 12th class day, you'll need to execute a Q drop before the Q-drop deadline, which typically occurs near the middle of the semester. Under Texas law, you are only allowed six Q drops while you are in college at any public Texas institution. For more information, see:

<http://www.utexas.edu/ugs/csacc/academic/adddrop/qdrop>

University Resources for Students

COVID-19 Update: "Keep Learning" Resources

This course may be offered in a format to which you are unaccustomed. If you are looking for ideas and strategies to help you feel more comfortable participating in our class, please explore the resources available here: <https://onestop.utexas.edu/keep-learning/>

Services for Students with Disabilities

The university is committed to creating an accessible and inclusive learning environment consistent with university policy and federal and state law. Please let me know if you experience any barriers to learning so I can work with you to ensure you have equal opportunity to participate fully in this course. If you are a student with a disability, or think you may have a disability, and need accommodations please contact Services for Students with Disabilities (SSD). Please refer to SSD's website for contact and more information: <http://diversity.utexas.edu/disability/>. If you are already registered with SSD, please deliver your Accommodation Letter to me as early as possible in the semester so we can discuss your approved accommodations and needs in this course.

Counseling and Mental Health Center

[The Counseling and Mental Health Center](#) serves UT's diverse campus community by providing high quality, innovative and culturally informed mental health programs and services that enhance and support students' well-being, academic and life goals. To learn more about your counseling and mental health options, call CMHC at (512) 471-3515.

If you are experiencing a mental health crisis, call the CMHC Crisis Line 24/7 at (512) 471-2255.

The Sanger Learning Center

Did you know that more than one-third of UT undergraduate students use the Sanger Learning Center each year to improve their academic performance? All students are welcome to take advantage of Sanger Center's classes and workshops, private learning specialist appointments, peer academic coaching, and tutoring for more than 70 courses in 15 different subject areas. For more information, please visit <http://www.utexas.edu/ugs/slc> or call 512-471-3614 (JES A332).

Undergraduate Writing Center: <http://uwc.utexas.edu/>

Libraries: <http://www.lib.utexas.edu/>

ITS: <http://www.utexas.edu/its/>

Student Emergency Services: <http://deanofstudents.utexas.edu/emergency/>

BeVocal

BeVocal is a university-wide initiative to promote the idea that individual Longhorns have the power to prevent high-risk behavior and harm. At UT Austin all Longhorns have the power to intervene and reduce harm. To learn more about

BeVocal and how you can help to build a culture of care on campus, go to:

<https://wellnessnetwork.utexas.edu/BeVocal>.

Important Safety Information:

COVID-19 Update: While we will post information related to the contemporary situation on campus, you are encouraged to stay up-to-date on the latest news as related to the student experience.

<https://coronavirus.utexas.edu/students>

If you have concerns about the safety or behavior of fellow students, TAs or Professors, call BCAL (the Behavior Concerns Advice Line): 512-232-5050. Your call can be anonymous. If something doesn't feel right – it probably isn't. Trust your instincts and share your concerns.

Emergency Evacuation Procedures

The following recommendations regarding emergency evacuation from the Office of Campus Safety and Security, 512-471-5767, <http://www.utexas.edu/safety/>

Occupants of buildings on The University of Texas at Austin campus are required to evacuate buildings when a fire alarm is activated. Alarm activation or announcement requires exiting and assembling outside.

- Familiarize yourself with all exit doors of each classroom and building you may occupy. Remember that the nearest exit door may not be the one you used when entering the building.
- Students requiring assistance in evacuation shall inform their instructor in writing during the first week of class.
- In the event of an evacuation, follow the instruction of faculty or class instructors. Do not re-enter a building unless given instructions by the following: Austin Fire Department, The University of Texas at Austin Police Department, or Fire Prevention Services office.
- Link to information regarding emergency evacuation routes and emergency procedures can be found at: www.utexas.edu/emergency

Title IX Reporting

Title IX is a federal law that protects against sex and gender-based discrimination, sexual harassment, sexual assault, unprofessional or inappropriate conduct of a sexual nature, dating/domestic violence and stalking at federally funded educational institutions. UT Austin is committed to fostering a learning and working environment free from discrimination in all its forms. When unprofessional or inappropriate conduct of a sexual nature occurs in our community, the university can:

1. Intervene to prevent harmful behavior from continuing or escalating.
2. Provide support and remedies to students and employees who have experienced harm or have become involved in a Title IX investigation.
3. Investigate and discipline violations of the university's relevant policies.

Beginning January 1, 2020, Texas Senate Bill 212 requires all employees of Texas universities, including faculty, report any information to the Title IX Office regarding sexual harassment, sexual assault, dating violence and stalking that is disclosed to them. Texas law requires that all employees who witness or receive any information of this type (including, but not limited to, writing assignments, class discussions, or

one-on-one conversations) must be reported. **I am a Responsible Employee and must report any Title IX related incidents** that are disclosed in writing, discussion, or one-on-one. Before talking with me, or with any faculty or staff member about a Title IX related incident, be sure to ask whether they are a responsible employee. If you would like to speak with someone who can provide support or remedies without making an official report to the university, please email advocate@austin.utexas.edu. For more information about reporting options and resources, visit <http://www.titleix.utexas.edu/>, contact the Title IX Office via email at titleix@austin.utexas.edu, or call 512-471-0419.

Although graduate teaching and research assistants are not subject to Texas Senate Bill 212, they are still mandatory reporters under Federal Title IX laws and are required to report a wide range of behaviors we refer to as unprofessional or inappropriate conduct of a sexual nature, including the types of conduct covered under Texas Senate Bill 212. The Title IX office has developed supportive ways to respond to a survivor and compiled campus resources to support survivors.

COVID-19 Updates: Fall 2020 Semester

Safety and Class Participation/Masks:

For every face-to-face class experience, we will all need to make some adjustments in order to benefit from in-person classroom interactions in a safe and healthy manner. Our best protections against spreading COVID-19 on campus are masks (defined as cloth face coverings) and staying home if you are showing symptoms. Therefore, for the benefit of everyone, this means that all students are required to follow two important rules:

- **Every student must wear a cloth face covering properly in class and in all campus buildings at all times.**
- **Every student must engage in documented daily symptom screening.** This means that each class day in which on campus activities occur, students must upload certification from the symptom tracking app and confirm that they completed their symptom screening for that day to Canvas. Students should not upload the results of that screening, just the certificate that they completed it. If the symptom tracking app recommends that the student isolate rather than coming to class, then students must not return to class until cleared by a medical professional.

If a student is not wearing a cloth face covering properly in the classroom (or any UT building), that student must leave the classroom (and building). If the student refuses to wear a cloth face covering, class will be dismissed for the remainder of the period, and the student will be subject to disciplinary action as set forth in the university's Institutional Rules/General Conduct 11-404(a)(3). Students who have a condition that precludes the wearing of a cloth face covering must follow the procedures for obtaining an accommodation (<https://orientation.utexas.edu/students-with-disabilities>)

Sharing of Course Materials is Prohibited:

No materials used in this class, including, but not limited to, lecture hand-outs, videos, assessments (quizzes, exams, papers, projects, homework assignments), in-class materials, review sheets, and additional problem sets, may be shared online or with anyone outside of the class unless you have my explicit, written permission. Unauthorized sharing of materials promotes cheating. It is a violation of the University's Student Honor Code and an act of academic dishonesty. I am well aware of the sites used for sharing materials, and any materials found online that are associated with you, or any suspected unauthorized sharing of materials, will be reported to Student Conduct and Academic Integrity in the Office of the Dean of Students. These reports can result in sanctions, including failure in the course.

Class Recordings: Class recordings are reserved only for students in this class for educational purposes and are protected under FERPA. The recordings should not be shared outside the class in any form. Violation of this restriction by a student could lead to Student Misconduct proceedings.