

# **Astronomy 7939: Special Topics**

## **Neutron Stars and Black Holes**

Course Dates for 2024 Spring:  
January 8 – April 24

Lecture Times and Locations:  
Mondays, Wednesdays and Fridays: 1:55 PM – 2:45 PM (7) in BRT 3

Instructor: Dr. Paul Sell  
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Office Hours: TBD and by appointment  
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Office Phone: (352) 294–1867

Course Website: Canvas/E-Learning

**Textbook:** There is no single good textbook for this course. I will be drawing from a variety of textbooks, publications and notes. Here are some recommended texts:

- *Accretion Power in Astrophysics* by Frank, King and Raine
- *High Energy Astrophysics* by Longair
- *Black Holes, White Dwarfs, and Neutron Stars* by Shapiro and Teukolsky
- *Special and General Relativity: With Applications to White Dwarfs, Neutron Stars, and Black Holes* by Glendenning
- *High Energy Astrophysics: An Introduction* by Courvoisier
- *Radiative Processes in Astrophysics* by Rybicki and Lightman
- *Spacetime and Geometry: An introduction to General Relativity* by Carroll

**Brief Description:** This course is primarily intended for PhD students in astronomy and astrophysics, and will study the observational and theoretical properties of compact objects (black holes and neutron stars) at the current level of understanding in the field.

### Detailed Description of the Graded Course Structure

**Class Participation:** Regular class attendance is expected. See the university policy regarding excused absences: <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>.

**Homeworks:** Problem sets will be regularly assigned throughout the semester. Late homework will generally not be accepted.

Working in groups is allowed for homeworks and (usually strongly encouraged) for in-class activities, although if you do, discuss the problem/solution and then write your own answers without looking at the other students' paper. Each student is required to show all work and submit separate homework solutions; no emailed work.

**Project:** A handout and discussion to explain the project fully will be provided when appropriate. All guidelines including due dates will be provided.

Note: there are no exams for this course.

**Course Grade Summary Breakdown:** Each of the components of class described above will be assigned the following weights to determine your final score:

- Class Participation: 20%
- Project: 40%
- Homeworks: 40%

**Grading Scale:** (<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>)

<u>Score</u>	<u>Grade</u>	<u>Score</u>	<u>Grade</u>	<u>Score</u>	<u>Grade</u>
90% – 100%	A	77% – 79%	B–	64% – 66%	D+
87% – 89%	A–	74% – 76%	C+	60% – 63%	D
84% – 86%	B+	70% – 73%	C	57% – 59%	D–
80% – 83%	B	67% – 69%	C–	< 57%	E

Note that I reserve the right to "curve" scores up, if I determine that the class score distribution indicates a mismatch between performance and my expectations. This can ONLY improve your numerical score and corresponding letter grade -- I will never apply a curve to reduce a student's score below the raw score.

### Class/University Policies

- Please put your phones and, unless you are taking notes, your laptops away during class: no Facebook, Twitter, texting, etc.
- You may need to make calculations, so you should always have available a scientific calculator in addition to your usual materials for taking notes.
- Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center by visiting [disability.ufl.edu/students/get-started](https://disability.ufl.edu/students/get-started). It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as

possible in the semester. Classroom accommodations can only be provided after appropriate verification.

- Responsible citizenship among college students includes honesty and integrity in classwork; regard for the rights of others; and respect for local, state, and federal laws as well as campus standards. Students are responsible for understanding the standards of the “Code of Student Conduct” and the Student Handbook. From the Academic Honesty Guidelines and Student Conduct Code in the University of Florida Undergraduate Catalog: “Academic Honesty: The university requires all members of its community to be honest in all endeavors. A fundamental principle is that the whole process of learning and pursuit of knowledge are diminished by cheating, plagiarism, and other acts of academic dishonesty. In addition, every dishonest act in the academic environment affects other students adversely, from the skewing of the grading curve to giving unfair advantage for honors or for professional or graduate school admission. Therefore, the university will take severe action against dishonest students. Similarly, measures will be taken against faculty, staff, and administrators who practice dishonest or demeaning behavior.” Any student caught cheating will be referred to the Honor Code Chancellor.
- Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

## Campus Resources

### **Health and Wellness**

- *U Matter, We Care*: If you or someone you know is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu), 352-392-1575, or visit [U Matter, We Care website](#) to refer or report a concern and a team member will reach out to the student in distress.
- *Counseling and Wellness Center*: [Visit the Counseling and Wellness Center website](#) or call 352-392-1575 for information on crisis services as well as non-crisis services.
- *Student Health Care Center*: Call 352-392-1161 for 24/7 information to help you find the care you need, or [visit the Student Health Care Center website](#).
- *University Police Department*: [Visit UF Police Department website](#) or call 352-392-1111 (or 9-1-1 for emergencies).
- *UF Health Shands Emergency Room / Trauma Center*: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; [Visit the UF Health Emergency Room and Trauma Center website](#).

### Academic Resources

- *E-learning technical support:* Contact the [UF Computing Help Desk](#) at 352-392-4357 or via e-mail at [helpdesk@ufl.edu](mailto:helpdesk@ufl.edu).
- *Career Connections Center:* Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.
- *Library Support:* Various ways to receive assistance with respect to using the libraries or finding resources.
- *Teaching Center:* Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.
- *Writing Studio:* 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.
- *Student Complaints On-Campus:* [Visit the Student Honor Code and Student Conduct Code webpage for more information.](#)
- *On-Line Students Complaints:* [View the Distance Learning Student Complaint Process.](#)