The Well-Trained Mind Academy
Astronomy for the Rhetoric Stage
2022-2023

Required Texts:

- *Foundations of Astronomy,* 12th ed. Boston, MA: Cengage, 2016. (ISBN 978-1133103769)
- *The Glass Universe*. New York: Viking, 2016. (ISBN-13 978-0670016952)
- *Black Hole Survival Guide*. New York: Knopf, 2020. (ISBN-13 978-0525658221)

Course Description:

This class is an introductory survey course of astronomy at the rhetoric-stage level. Students will learn about the cosmos, the celestial sphere, a historical perspective of astronomy, the nature of light and spectroscopy, telescopes, our solar system and planetary systems in general, stellar formation and development, the nature and development of the Milky Way galaxy and galaxies in general, non-planetary bodies, orbital mechanics, life on other worlds, and the space race.

Upon completion of this course, students will have engaged with the nature of the scientific method, and gained an introductory understanding of basic astronomical concepts and principles. Students will use basic algebra and geometry concepts to work through astronomy principles, such as the motions of bodies in space. Students are expected to come to class prepared to discuss the assigned reading and other activities. Because part of Astronomy is spectroscopy (anything from analyzing photos to doing statistical analysis of wavelengths), this course will make use of images and image-based software. Students will be expected to work with data in scientific investigations and discuss their understanding with others.

Assignments:

- *Written responses, 15%:* 1-2 page (300-500 word) discussion of assigned work. Responses must be typed and submitted as a Word document in Blackboard.
- *Research Paper, 15%*: A 5-6 page (1250-1500 word summary) analysis of a discovery or technology that has impacted the field of astronomy (chosen by the student and then approved by the instructor), using at least *four sources* from outside class materials, using APA style. The paper must be typed and submitted as a Word document in Blackboard. More details to be posted in Blackboard.
- *Weekly Discussion Questions (DQs), 15%*: Discussion questions will be drawn from lectures, supporting materials, and the required texts. Each student must write a substantive reply to the question by midnight, EST, Monday, and substantively respond to two other students' responses by midnight, EST, on Wednesday.
- *Weekly comprehension quizzes, 15%.* Quizzes will consist of image identification, and item significance identification.
- *Unit Exams, 20%:* Blackboard-based examination on material covered in each unit. All Unit Exams will be comprehensive, so students can expect to see questions on material covered since the beginning of the course. Identifications, short answers, and brief essay questions.
- *Final Exam, 20%*: Blackboard-based examination on material covered throughout the semester. Identifications, short answers, and brief essay questions.

Course Work	**Percentage**
Weekly Quizzes	15
Discussion Questions	15
Written Responses	15
Research Paper	15
Unit Exams	20
Final Exam	20
Total	100

Schedule:

The schedule is subject to updates. Please see Blackboard announcements for changes.

- *Monday*—Discussion Question Response
- *Wednesday*—Response to two other students due
- *Friday*—Assignments due

Astronomy Schedule 2022

WK	Date	Topic	Assignment
0		Introduction	
1		DQs HW/Quiz	*Foundations of Astronomy* – Chapter 1 "Here and Now" *The Glass Universe - Preface xi*
2		DQs HW/Quiz	*Foundations of Astronomy* – Chapter 2 "A User's Guide to the Sky" *The Glass Universe - Chapter 1 Mrs. Draper's Intent 3*
3		DQs HW/Quiz	*Foundations of Astronomy* – Chapter 3 "Cycles of the Moon" *The Glass Universe - Chapter 2 What Miss Maury Saw 21*
4		DQs HW/Written Response Due	*Foundations of Astronomy* – Chapter 4 "Origins of Modern Astronomy" *The Glass Universe - Chapter 3 Miss Bruce's Largesse 40*
5		DQs HW/Quiz	*Foundations of Astronomy* – Chapter 5 "Gravity" *The Glass Universe - Chapter 4 Stella Nova 56*
6		DQs HW / Quiz	*Foundations of Astronomy* – Chapter 6 "Light and Telescopes" Part 1 *The Glass Universe - Chapter 5 Bailey's Pictures from Peru 71*
7		DQs / HW / Unit Exam	*Foundations of Astronomy* – Chapter 6 "Light and Telescopes" Part 2 *The Glass Universe - Chapter 6 Mrs. Fleming's Title 89*
8		DQs HW/Quiz	*Foundations of Astronomy* – Chapter 7 "Atoms and Spectra" *The Glass Universe - Chapter 7 Pickering's "Harem" 105*
9		DQs HW/Quiz	*Foundations of Astronomy* – Chapter 8 "The Sun" *The Glass Universe - Chapter 8 Lingua Franca 123*
10		DQs HW/Written Response Due	*Foundations of Astronomy* – Chapter 9 "The Family of Stars" Part 1 *The Glass Universe - Chapter 9 Miss Leavitt's Relationship 141*
11		DQs HW/Quiz	*Foundations of Astronomy* – Chapter 9 "The Family of Stars" Part 2 *The Glass Universe - Chapter 10 The Pickering Fellows 159*
12		DQs HW/Quiz	*Foundations of Astronomy* – Chapter 10 "The Interstellar Medium" *The Glass Universe - Chapter 11 Shapley's "Kilo-Girl" Hours 179*
13		DQs HW/Quiz	*Foundations of Astronomy* – Chapter 11 "The Formation and Structure of Stars" Part 1 *The Glass Universe - Chapter 12 Miss Payne's Thesis 196*
14		DQs HW/Unit Exam	*Foundations of Astronomy* – Chapter 11 "The Formation and Structure of Stars" Part 2 *The Glass Universe - Chapter 13 The Observatory Pinafore 215*

15		DQs HW/Written Response	*Foundations of Astronomy* – Chapter 12 "Stellar Evolution" *The Glass Universe - Chapter 14 Miss Cannon's Prize 232*
16		DQs HW/Quiz	*Foundations of Astronomy* – Chapter 13 "The Deaths of Stars" *The Glass Universe - Chapter 15 The Lifetimes of Stars 249*
17		Final	**No lecture (END OF SECOND QUARTER)**
NO CLASS Winter Break			
1		DQs HW/Quiz	*Foundations of Astronomy* – Chapter 14 "Neutron Stars and Black Holes" *Black hole survival guide* - Entrance
2		DQs HW/Unit Exam	*Foundations of Astronomy* – Chapter 15 "The Milky Way Galaxy" Part 1 *Black hole survival guide* - Space
3		DQs HW/Quiz	*Foundations of Astronomy* – Chapter 15 "The Milky Way Galaxy" Part 2 *Black hole survival guide* - Horizon
4		DQs HW/Written Response Due	*Foundations of Astronomy* – Chapter 16 "Galaxies" *Black hole survival guide* - Nothing
5		DQs HW/Quiz	*Foundations of Astronomy* – Chapter 17 "Active Galaxies and Supermassive Black Holes" *Black hole survival guide* - Time
6		DQs HW / Unit Exam	*Foundations of Astronomy* – Chapter 18 "Modern Cosmology" *Black hole survival guide* - Tardis
7		DQs HW/Quiz	*Foundations of Astronomy* – Chapter 19 "Origin of the Solar System" *Black hole survival guide* - Perfection
8		DQs HW/Quiz	*Foundations of Astronomy* – Chapter 20 "Earth" *Black hole survival guide* - Astrophysics
Holiday Break No Class -- to -- (END OF THIRD QUARTER)			
9		DQs HW/Written Response	*Foundations of Astronomy* – Chapter 21 "The Moon and Mercury" Research Paper – Topic Due *Black hole survival guide* - Evaporation
10		DQs HW/Quiz	*Foundations of Astronomy* – Chapter 22 "Venus and Mars" Research Paper – Gathering Evidence Week 1 Due *Black hole survival guide* - Information
11		DQs HW/Quiz	*Foundations of Astronomy* – Chapter 23 "Jupiter and Saturn" Part 1 Research Paper – Gathering Evidence Week 2 Due *Black hole survival guide* - Holograms

12		DQs HW/Written Response	*Foundations of Astronomy* – Chapter 23 "Jupiter and Saturn" Part 2 Research Paper – Draft Introduction / Conclusion Due *Black hole survival guide* - Firewalls
13		DQs HW/Quiz	*Foundations of Astronomy* – Chapter 24 "Uranus, Neptune, and the Kuiper Belt" Research Paper – Rough Draft Due *Black hole survival guide* - Exit
14		DQs HW/Written response due	*Foundations of Astronomy* – Chapter 25 "Meteorites, Asteroids, and Comets" Research Paper –Final Draft Edit Due
15		DQs HW / Unit Exam	*Foundations of Astronomy* – Chapter 26 "Astrobiology" Research Paper – Perfected Citations & Bibliography Due
16		DQs / Research Paper	Review Week Research Paper - Due
17		Final	**No lecture (END OF FOURTH QUARTER)**

Policies and Procedures:

Assignments:

- *Assignment Submission and Late Work Policy*: Assignments are due by 12 am Eastern Standard Time (-5:00 UTC) on the date listed in the syllabus. Late work will receive a letter grade reduction for every day that it is late, up to five days. After five days, late work will not be accepted. Essay assignments are to be submitted via BlackBoard in either .pdf, .doc, or .docx format.
- *Math Formatting*: The object of the course is mathematics, not technology. Therefore, while the use of LaTeX, MathType, Geogebra, and other software tools is encouraged, it is not required. A LaTeX editor is built into Blackboard for student use. At certain points, students may be expected to demonstrate use of a straightedge and compass, unless a student's documented exceptionality prevents such assignments. If students choose to hand-sketch and handwrite assignments that do not require handwork (i.e., can be done with LaTeX, etc), easily legible handwriting is required. In addition, all assignments, whether created with software or drawn by hand, must be uploaded to Blackboard in digital format. Therefore, emailed or texted assignments will not be accepted.
- *Partial Credit/Showing Your Work*: Requirements vary by problem type. Students are not required to show their work for Homework and Weekly Quiz problems—however, if they do not show their work, and get the problem wrong, they cannot get partial credit. Partial credit is only given for Homework and Weekly Quiz problems when all work is shown. Test problems drawn from the book require that students show work in order to receive any credit.
- *Style for Written Assignments*: Formatting is to be 12-point Times New Roman, double-spaced, with 1" margins. Use a single space between sentences, always use the Oxford comma, avoid the use of passive voice, and do not use the first person or address the audience directly. Students are to refer to the APA Style Manual. If students wish to purchase a hard copy, use ISBN-13: 978-1433805615 or ISBN-10: 1433805618.
- *Written Assignment Prior Review*: Students may submit an outline for feedback one week in advance of the deadline. Papers will be returned with written feedback at least 24 hours prior to the submission deadline. This option is not available for the final exam.
- *Written Assignment Revision*: Within one week after receiving graded papers, students may revise papers for an improved grade, not to exceed one letter grade above the original grade. This option is not available for the final exam.
- *Meaningful Participation:* A good rule of thumb is if you don't spend at least several minutes thinking about or developing your position and explaining it in a concise and clear manner, then it probably will not be meaningful. Criticizing without offering support is not considered worthwhile participation, and you will not receive credit. Examples of meaningful participation include:
    - Sharing a related experience
    - Commenting on others' experiences
    - Asking others questions about their ideas and/or experiences
    - Offering a different perspective about an idea that is being discussed
    - Describing an interesting idea from the week's reading and explaining what you learned
    - Asking the group a question about something in the course
    - Disagreeing (respectfully)
    - Describing a problem and asking for help
    - Describing how you've used something you've learned in the course
    - Sharing a relevant resource
    - Describing relevant research and sharing information on how to find it
    - Noting, briefly, the content and/or purpose of a useful website and providing a link (it is a violation of copyright law to copy the actual page)

Instructor Contact:

- *Office Hours*: Office hours are opportunities to discuss a student's academic work in progress and consider how a student might improve. Students may use office hours as a time to ask questions about work in progress as well. Office hours are scheduled, by appointment, in 15-minute increments. I am also available outside of office hours, by prior request and mutual agreement.
- *Instructor Availability:* Please email me with any questions or concerns you have regarding the course. I will respond to any email within 24 hours during weekdays (but this is not guaranteed for emails submitted over the weekend). Instructor availability is limited on weekends.

General:

- *Attendance*: Enrolled students are expected to attend class on a regular basis. If the student does not attend class, or is late for class, the responsibility for missed material and work falls upon the student. Attendance will be taken at the beginning of each lecture. A student who misses more than 25% of any course will not receive a grade or certificate of completion.
- *Mixing Live and Delayed Sessions:* Students who plan to attend a mix of live and delayed sessions within a particular course must receive written permission from either the Headmaster or Dean and the course instructor prior to the beginning of the semester. Approved substitutions will not count towards the student's overall number of missed classes. In this class, no more 4 lectures per semester may be substituted with a delayed lecture. Students are responsible for making up all missed work. Students attending both the live and delayed sections who miss more than 25% (3 lectures in a single semester, once-a-week course) of the live sessions they are expected to attend will not receive a grade or certificate of completion.
- *Archived Work:* Students are responsible for keeping an archive of all work completed for this course, including work posted to Blackboard. Before posting an assignment to Blackboard:

  1) File hardcopy work in a binder; each course should have its own binder.
  2) Store digital copies of work either on the student's computer or in the cloud; each course should have its own folder. Folders should be labeled with the course name and year in which the student participated in the course (use abbreviations if necessary).
  3) All files should be labeled with the assignment name, course name, and date. Example for an assignment on the digestive system for a Health Class due January 10, 2017: Digestive-System_Health-01_10_17 If work is stored in a folder in the cloud, the login information (email address and password) should be located in two separate locations in the home so that, if the student forgets his password, he can easily look it up and access his work.
- *Textbook Readings*: Students are responsible for all the material in the textbook, whether or not specific material is discussed during class.
- *Electronic Devices*: Students are welcome to have other electronic devices that support their educational endeavors. All background noises should be silenced as a courtesy to other students. If students must leave the class for any reason, they should simply note themselves as being "Away."
- *Students with Disabilities*: If students have a documented learning disability, a serious hearing or vision problem, or any other special need that might affect their performance and participation in class, please inform me during the first week of class so that I might make appropriate accommodations. Lecture slides are available upon request.
- *Religious Observances:* Parents are to notify me in the first week of class regarding religious observances that conflict with classes.
- *Learning Environment*: I expect to maintain a positive learning environment based upon open communication, mutual respect, and non-discrimination. I will not discriminate based on race, gender, age, disability, veteran status, religious tradition, sexual orientation, color, or national origin. Any suggestions as to how to further a positive and open environment will be appreciated and given thoughtful consideration.
- *Well-Trained Mind Academy Honor Code*

Academic integrity is a core value of the Well-Trained Mind Academy. Cheating, stealing, lying and/or plagiarism, which inhibit student learning and disrupt the trust between student and Instructor, do not have a place in our school community. Instructors will not tolerate any violation of the Honor Code. If a student is found in violation of the Honor Code, he or she may receive a zero for the assignment in question, receive a failing grade in the course, or be asked to leave the Academy. Parents will be notified by the Instructor, Dean or Headmaster if there is any violation of the Honor Code.

As a member of the Well-Trained Mind Academy, I pledge on my honor not to cheat, steal, lie, or plagiarize. I understand that such acts violate the Honor Code and will result in punitive action at the discretion of my Instructor, the Dean, or the Headmaster.