



SCHOLÉ ACADEMY
CLASSICAL ACADEMIC PRESS

Astronomy IB

Mr. Chris Hall

Spring Semester Course
2023-2024

ELIGIBLE STUDENT:

Grades 6–9; 10th graders welcome: Students must be able to read independently and to create notes that are organized and easy to follow. Students should be able to express themselves effectively through writing, and must be capable of reviewing information and concepts on their own throughout the year outside of class. A foundation in arithmetic, including integer, fraction, and decimals, plus experience in basic algebra and geometry (perimeter, area, volume, measurement) would be a plus.

Please note: Course includes multiple laboratory exercises in addition to in-class coursework. Lab reports may require time outside of class to complete.

REQUIRED TEXTS AND MATERIALS:*

- Notebook paper
- A binder or binder section devoted to the course
- Ruler, protractor, and compass
- Colored pencils
- Graph Paper
- A planisphere (Links will be provided ahead of class)
- A headlamp with a red LED option. (Links will be provided ahead of class.)
- Resources to be posted as printables and downloadable files on the course web page.

COURSE SCHEDULE

REGULAR CLASS SCHEDULE: MONDAY AND WEDNESDAY, 2:00-3:15 PM ET

ORIENTATION SESSION:

The date and time of the student/parent orientation will depend on the particular section in which you are enrolled, but all orientation sessions will be scheduled during the week prior to the start of the class.

CLASS SESSION DATES: The dates of your class depend on the particular section in which you are enrolled. Consult the Scholé Academy [academic calendar](#) for details concerning scheduled, school-wide breaks.

OFFICE HOURS: Your teachers are available outside of scheduled class times. During “Office Hours” students may raise questions, seek assistance, or review class material. This can happen via email or a meeting in the Zoom classroom. Your teacher will do their best to respond within 24-48 hours; please keep in mind that they likely will not respond immediately to messages after 5 p.m. EST.

COURSE DESCRIPTION

“The heavens are telling the glory of God; and the firmament proclaims his handiwork.” (Psalm 19:1)

Creation sings the praise of God! Creation has a divinely appointed order to it, and this order ultimately points to Him and His glory. As such, we seek to appreciate and understand creation through the exploration of the sciences, and this appreciation leads us to treasure the natural world and teaches us truths about the God who made it.

The course will include time for lecture, during which the Socratic method will be employed to engage the students and to encourage them to think more deeply about the material rather than just absorb facts. Instructor-guided lab exercises will also be conducted during scheduled class time.

The course will also center around observation time, outside at night and under the stars. Many of our in-class experiences will play into and off of observations made during this time. Students will learn to apply the lessons learned during class to their observations. By the end of the course, students will be able to give a seasonal sky tour complete with names and descriptions of celestial objects, name the brightest visible stars and constellations (as well as any visible planets and locations of invisible deep sky objects), and have a growing awareness of the sky as three dimensional: we are simply riding on a planet orbiting around a star, one that floats along in a river of stars, and that vision contributes to one of the most awesome understandings of not only how small we are, but how greatly we are loved, to be here wondering at it all.

COURSE MAP

Introduction to Observational Astronomy

- how to make naked eye observations
- selection of an ideal vantage point from which to make observations for the semester
- observational journaling and recordkeeping
- current events in astronomy (tracking across the course)
- resources and tools for observing (planisphere, star atlas, online resources)

Foundational Astronomy

1. Our Cosmological Address
2. Seasonal Skies
 - winter into spring stellar navigation
 - constellations of the winter into spring skies
3. Life Cycle of Stars
 - the stellar timeline, H-R diagram
 - stellar spectra
4. The Solar System
 - the planets, dwarf planets, asteroids, and TNOs
 - patterns in the solar system

Space History- manned and unmanned missions,

Simulated Space Mission- conceive, budget for, design, and roleplay the launch of a space mission to a solar system target of your choice.

STUDENT EXPECTATIONS: EXECUTIVE FUNCTION SKILLS

Students enrolling in this course will be expected to show development of Executive Function skills throughout the year. Executive Function is a set of qualities and skill sets students can develop and hone to better approach the courses, lectures, readings and teachers they will face in their future academic coursework.

Each teacher will invariably have his own set of requirements and skills he requires students to bring to their studies. Generally speaking, I believe there are five such qualities that are necessary for my students in various subjects:

- 1. An Engaged Student:** One who is willing to step into the arena of class discussion, ask questions, supply answers, take in what is being discussed, and apply it to his own experience.
- 2. Note Taking:** A student who during and after being engaged with the class has been trained to note important and relevant content in an organized fashion. His notes would then be consulted, independently, for application in assignments and assessments. For those who need a framework from which to begin or refine this process, Cornell notes is a helpful system.
- 3. Attention to Detail & Preparedness:** Students should consistently adhere to deadlines, submission requirements, proper reporting formats (ex. project reports, commonplace updates), confirm technology is working prior to the start of class, determine how to proceed after an absence, be responsible for consulting his course syllabus and adjusting as the class proceeds, etc..
- 4. Employ Critiques:** When students receive feedback to one of their submissions, they should apply that feedback to future assignments. Students should also glean information from the live class critiques to learn from the experience of others.
- 5. Initiative/Maturity:** Students should hear the teacher comments and be able to assess whether or not the teacher was describing his work, and then take the initiative to schedule office hours with his teacher if necessary.

STUDENT EXPECTATIONS IN ACTION

Students are expected to arrive to class on time and with all assigned material completed. The instructor will facilitate learning for the student, but the responsibility for staying up-to-date with classwork and assignments ultimately falls to the student.

Students will be expected to listen attentively and to participate actively in class discussions and practices. During class discussion, students will review answers, pose questions, explain and justify their answers and solutions. Students will also be expected to maintain their commonplace

notebook, submit drawings and preliminary plans before starting projects when appropriate, and be prepared to discuss the current state of any ongoing projects at any time.

All assignments will be due at the date and time specified in the assignment post. Students turning in late work will earn a 10% penalty for each day the assignment is late. Students will submit their work by scanning their homework pages and uploading onto the assignment post. Photographs of projects are the best way to document the physical artifacts we'll create during this course, but all written work must be scanned for submission, not photographed.

STUDENT GRADING AND EVALUATION

While studying Astronomy through Scholé Academy will be “restful” (and also an occasion for joy, awe, and wonder!), we also recognize the need to provide grades for students who will be using this course as part of their prepared college transcript. It’s a delicate balance to achieve both restful learning and excellent academic performance. Earning a specific grade should not overshadow achievement goals for mastery of this discipline. Astronomy seeks to feed and focus the natural curiosity of students, imparting not only a wealth of knowledge, but also developing skills in young natural philosophers (scientists who apprehend and apply the greater vision of God’s handiwork in nature) that will serve them well as they go on to explore advanced studies in the field. In that sense then, mastery of the understandings, methods, and contexts is its own reward in and of itself.

Traditional percentage grades will be provided and will be readily accessed on the *Astronomy Canvas* page. Additionally, Mr. Hall will provide a transcript of that grade to the requesting parent at the end of the year.

STUDENT EVALUATION : MASTERY PORTRAIT

Mastery portrait: Students who are prepared to take this class are typically early to late teens, adolescents approaching young-adulthood. This developmental stage is an interesting one, brimming with lots of new characteristics. It’s imperative, then, that this course not only provide the academic components necessary to achieve mastery of the content of the class (knowledge) and skills associated with analytical thought, but to also help engage the student in development of their moral virtues. These aspects of the course would comprise the “learning target”.

- Students will be able to state and demonstrate principles for sound naked eye observational astronomy.
- Students will be able to state their cosmological address, and compare and contrast the sizes and scales of celestial objects such as planets, stars, solar systems, galaxies, and galactic clusters.
- Students will be able to state the importance of the powers of ten as a paradigm for observational astronomy.
- Students will be able to demonstrate the use of a planisphere and star atlas for celestial navigation.
- Students will be able to identify the summer, fall, and winter constellations.
- Students will be able to diagram the life cycles of stars, and point out representatives of various phases in that life cycle in the night sky.
- Students will be able to show stages of star development on the H-R diagram, and how to identify the age of stars by their stellar spectra.
- Students will be able to identify the patterns inherent in the solar system, and identify by name the main planets and dwarf planets.
- Students will be able to tell how scientists identify and classify extrasolar planets.
- Students will be able to summarize the history of human spaceflight, including major missions throughout the Space Race and beyond.
- Students will demonstrate proficiency in applied knowledge through the Simulated Space Mission.

STUDENT EVALUATION: ASSIGNMENTS, TYPES & WEIGHTS

Mr. Hall will communicate with students regarding assignment feedback and grading through the Canvas online grading system.

Student's grades will be comprised of:

1. Exams: 40% of the grade
2. Quizzes: 15% of the grade
3. Lab Work./Projects: 20% of the grade
4. Assignments: 15% of the grade
5. Class Participation: 10% of the grade

STUDENT EVALUATION: ACADEMIC INTEGRITY

Students will often take tests and/or quizzes privately at home. Students are on their honor to abide by Scholé Academy's Learning Philosophy which assumes the personal cultivation of student virtues described in the Student-Parent Handbook. We ask that parents proctor quizzes and tests to help keep their children accountable. Note that cheating and plagiarism are punishable offenses. Copying the work of other students is prohibited and proper citation of all sources is essential.

THE VIRTUAL CLASSROOM:

We will be using the free online "virtual classroom" software provided by Zoom. The live, interactive nature of our courses is foundational and we require cameras to be on during all class sessions. The virtual classroom will provide students with interactive audio and an interactive whiteboard in which texts, diagrams, video and other media can be displayed and analyzed. We will provide students with a link (via email) that will enable students to join the virtual classroom. Courses will be managed through our learning management system, Canvas.

Specific information regarding the technology used by Scholé Academy (including required technology) can be found by visiting the [Technology in the Classroom](#) section of the Student Parent Handbook.

ABOUT THE INSTRUCTOR



Chris Hall has a BA in philosophy from Gettysburg College and an MAT in elementary education from Towson University. He has been a classroom educator and administrator for 28 years, having served in public, independent, and classical schools. In that time, he has served as a classroom teacher in grades K-12, primarily as a science educator, PK-8 Science Department Chair, and a Lower School Academic Dean. Along with his professional pedigree, he is a lifelong practitioner of several of the common arts profiled in his book *Common Arts Education: Renewing the Classical Tradition of Training the Head, Hands, and Heart* (Classical

Academic Press, 2021) and the founder of Always Learning Education, an organization dedicated to teaching, learning, and propagating the common arts. He lives on a small, homesteaded farm in central Virginia with his wife and three homeschooled sons.

Please note: While this syllabus addresses details specific to this course, it is not extensive. Parents should also read the Student-Parent Handbook located on scholeacademy.com and be familiar with the ideas, policies, and procedures outline.

