

*** BECKER'S ***

ASTRONOMY SURVIVAL NOTEBOOK

Gary A. Becker

Moravian University Astronomy, PHYS-108

www.astronomy.org

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TIME

- How to stop time: kiss or hug
- How to travel in time: read
- How to escape time: music
- How to feel time: write
- How to release time: breathe

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When I heard the Learn'd Astronomer

When I heard the learn'd astronomer,
 When the proofs, the figures, were ranged in columns before me,
 When I was shown the charts and diagrams, to add, divide and measure them,
 When I sitting heard the astronomer where he lectured with much applause in the lecture-room,
 How soon unaccountable I became tired and sick,
 Till rising and gliding out I wander'd off by myself,
 In the mystical moist night-air, and from time to time,
 Looked up in perfect silence at the stars.

—Walt Whitman— (1819–1892). *Leaves of Grass*, 1900.

Morning Song

A diamond in the morning
 Waked me an hour too soon:
 Dawn had taken in the stars
 And left the faint white moon.

O white moon, you are lonely,
 It is the same with me,
 But we have the world to roam over,
 Only the lonely are free.

—Sara Teasdale— (1884-1933)

In Astronomy Lab 106

When I sit in the all-scientific Astronomy Lab 106
 with long tables and awkward chairs,
 When I smell that slightly stringent
 smell and hear the throaty thrums
 of air conditioners and circulatory systems,
 I think of my past college years.
 How frightened I was
 to think how an English major
 fit in with these Ice Station Zebra
 surroundings.
 Now 48 years later, the sting of GPAs,
 the flush of feeling stupid,
 the intricate understanding swept away,
 I am left with a profound and grateful
 spirit that I had the experience,
 that I had survived it, and that I
 now wish it wasn't all over.

—Susanna— (June 2, 2018)
 written in Room 106, Collier Hall of Science...



“Oh gravity, thou art a heartless bitch.”
 —Dr. Sheldon Cooper, *Big Bang Theory*, CBS—

Moravian University Astronomy—Spring Term 2024

Tues./Thurs. (PHYS-108 PM), 6:30 p.m. to 9:30 p.m.

Instructor: Gary A. Becker; **Phones:** Cell-610-390-1893 / Moravian Office (113)-610-861-1476

Office: 113 Collier—**Office Hours:** Rm. 106, Tues/Thurs 6 p.m. by appointment or **after class**.

The office is located on the first floor (basement), middle of the hall, on the Main Street side of Collier.

Email: beckerg@moravian.edu or garyabecker@gmail.com

Web Page: Moravian University Astronomy, www.astronomy.org

Moravian astronomy classes meet in the Astronomy/Geology Lab, Room 106, located in the basement (actually considered the first floor) of the Collier Hall of Science.

Required Texts: *Becker's Astronomy Survival Notebook (BASN)* which is available online, [here](#). Additional articles can also be found online included with the appropriate chapter (sessions) of the book. **Students will always bring to class their MacBooks or iPads and their smart phones so they can have access to these materials and more.** Your smart phone may be used as a calculator (not for exams), a flashlight, for astronomy applications, or to check relevant information. Binoculars, if you have them, are fun to bring along on observing nights, but not a requirement of the course.

About this Syllabus: Consider this syllabus as an evolving or working document that helps to keep you and your instructor on track. A working document implies that **there may be changes**. Be more aware of the order of the presentations than the dates associated with the specific lessons. Weekly assignments will be given in CANVAS in the announcement and in the assignment sections. Due dates of assignments will reflect the current content of the material being discussed and will need an appropriate excuse if handed in late.

PHYS-108 Syllabus

Your Portal to completing successfully Moravian University Astronomy
www.astronomy.org

When to Report to Astronomy Class/Basic Information

Here are some general procedures for classroom operations.

- **Do not complete exercises in [my book](#) unless assigned.**
- **Homework is to be completed on the assigned date and submitted in person.** If ill, have someone designated to hand in the homework for you and provide information about missed work.
- **You are expected to present a valid excuse after you return from an absence or inform your instructor before class, via email, that you will be absent from class.** Otherwise, your absence will be considered unexcused. There are penalties for unexcused absences. These can be found in the *Student Information/Syllabus/Class Routine* section of my book, *Becker's Astronomy Survival Notebook*.

- **COVID RESTRICTIONS:** We will follow the masking regulations set by the Physics Department or Moravian University, whichever is more stringent: If required to be masked and you come unmasked to class, my policy will be, no class entry, no exceptions. That includes your nose being covered.
- **Not Feeling well, but well enough to come to class:** **Please wear a mask to protect your neighbors.**
- **Always bring your MacBook/iPad, and smart phone to class.** Use them appropriately.
- **Do not bring any food or snacks to class** unless you can provide a doctor's note or communications from the Health Center that it is a medical necessity. You may bring a nonalcoholic drink.
- **Classes will be taught without breaks.** If a class goes beyond the period limit, students will be compensated for the extra time expended with a free night if the appropriate amount of time (160 minutes) is accumulated.
- **Pick someone in class to act as a lifeline** so that you can work together to complete assignments, study and take exams. I will be establishing teams early in the semester.
- **My workdays are Mondays through Thursdays:** Respect the time that I will need to prepare for the next week's lesson and for me to have some downtime too! I enjoy speaking with people on my cell phone rather than writing long emails.

Week Zero—One week before classes begin—BEGIN NOW:

- **FOCUS will be on your ability to follow instructions, neatness,** and getting prepared from home for a smooth start to the semester. Begin preparing now to avoid being overwhelmed when starting this class. Guaranteed, this will reduce your stress levels during the first week of astronomy classes and school in general.
- **Read and understand:** Student Information/Syllabus/Class Routine found on page vii. You will understand what is expected of you and how I run my classes.
- **Complete the Student Information Sheets** in the Student Information Section and Submit this document, signed, on the first evening class. Make a copy for yourself and for me to facilitate discussions. You will be introducing yourself to the class (10 points).
- **Send me a picture of yourself,** not just any photo, but **one that you really like**, for the class photo. **NO SCREEN SHOTS.** My email is beckerg@moravian.edu. See other classes here, [Astronomy Class Photos](#) (5 points).
- **Information in grey** should not be completed. It's a reminder for your instructor.
- **Download *Stellarium*,** a free planetarium program available in Window and Mac formats. This will prove useful in class lab exercises that we will be completing during the semester.

Listen/view/watch the following materials for Week One and the first lesson: Video: [Class Routine](#) This is not the most stimulating presentation, but it will give you a head's up on how the class is structured. You can just listen to it. Ask questions for clarification during the first class on Week One.

Video: [International Space Station as Viewed from Moravian's Sky Deck-Shane S. Cassel](#),

Assignment for Week Zero: Pick one of the following four topics for your reflection piece.

For Tuesday, January 16: Write at least one reflection statement for the book or the YouTube video that you have chosen. Minimum length of writing for submission is two pages, double-spaced, in Word, 12-point type. Student's name, Instructor: Gary A. Becker; PHYS 108, Astronomy; Date, on the first four double-spaced lines on the upper left of page one. **Longhand submissions will not be accepted.** This will get us started on the first night of class (20 points).

- Reading: [THE BOOK, Astrophysics for People in a Hurry-Neil deGrasse Tyson](#)
- YouTube: [Stephen Colbert Interviews Neil deGrasse Tyson at Montclair Kimberley Academy](#)
- YouTube: [A mind-expanding tour of the cosmos with Neil deGrasse Tyson and Robert Krulwich](#)
- YouTube: [Neil deGrasse Tyson with Robert Krulwich: Letters from an Astrophysicist-Audiobook](#)

Be especially aware of vocabulary. You may want to review the Basic Astronomy Word List found in Session One of my [book](#), pages 15-16.

For Tuesday, August 29: In [S-01: Introduction to Astronomy](#), complete the *Distill the Definition to its Basic Meaning*, pp. 5-6. Follow the directions precisely. The vocabulary words which are to be distilled can be found on pp. 7-8. Make a copy of the assignment for you and for me (10 points). The copy for you will act as a study guide because there will be a quiz on these words on the following class evening.

1. **Example:** Astronomy—The science which investigates all matter and energy in the universe.
2. **Core Definition:** investigates all matter/energy in universe

Week One—Tuesday, Jan 16/Thursday, Jan. 18: [S-01: Introduction to Astronomy](#)

- **ALWAYS BRING YOUR COMPUTER TO EVERY CLASS.**
- **FOCUS:** Class introduction and class routine—student/teacher discussion.
- **FOCUS:** Students develop a definition for astronomy and vocabulary words.
- **FOCUS:** Student driven discussion about *Astrophysics for People in a Hurry* or one of the YouTube video you have digested —questions/reflections/thoughts about the universe in which we live. This is a wonderful chance for pupils to discuss and ask questions about anything in astronomy.
- **DEMONSTRATIONS:** Fahrenheit 451 experiment/expanding gases from an air can/plasma ball/dry ice is nice Thursday. Deferred until Misconceptions unit...
- **TUESDAY'S ASSIGNMENT:** Hand in questions/reflections/thoughts for *Astrophysics for People in a Hurry* or one of the YouTube videos (20 points). Remit your [Student](#) Information Sheet (10 points). Don't forget your picture (5 points).

- **TUESDAY'S ASSIGNMENT:** Hand in *Distill the Definition to its Basic Meaning*, pp. 5-6 in the [BASN Text](#). The words to be defined are found on pp. 7-8. See Week Zero for specific instructions. Follow the directions precisely. Make two copies, one for you and one for me. Your copy will allow you to study for the quiz that will be administered on the following evening of class (10 points).
- **Test your visual knowledge of astronomy** if time permits.
- **THURSDAY, QUIZ ON VOCABULARY:** Vocabulary in Session One—in class—in teams—match the definition of the word on one card with the word on a separate card—to be given at the end of the class—be happy!
- **Self-Test:** [Introduction to Astronomy Study Guide](#)
- **ASSIGNMENTS ARE DUE ON THE NIGHT OF YOUR CLASS.**

Week Two— Tuesday, Jan. 23/Thursday, Jan. 25: : [S-02: Popular Misconceptions](#) in Astronomy

- **ALWAYS BRING YOUR COMPUTER TO EVERY CLASS.**
- **TUESDAY'S FOCUS** on basic misconceptions in astronomy, lunar phases, motions of the moon: There are a million ways to learn about phases. Demonstrations, exercises, quiz preparation, fun times at Moravian University.
- **ASSIGNMENT:** Complete the Harvard University's misconception exercise, pp. 29-30, in the [BASN Text](#). This will be a graded assignment. **You should research and compare your answers with other students before class.** Make **two** copies, one for you and one for me. Hand in one of the copies before class (10 points). ***If you have not completed the assignment by the time class starts, you will receive a zero.***
- **ASSIGNMENT:** [BASN Text](#) Popular Misconceptions in Astronomy through Earth, sun, moon relationships.
- **PowerPoint:** Review the [Lecture Slides](#): Gain a little familiarity with the images that will be shown in this week's class. Familiarize yourself with Earth-Moon-Sun relationships
- **YouTube:** [Phases of the Moon \(Watch first\)](#)
- **YouTube:** [Phases and Motions of the Moon \(Watch second\)—Launch Pad Astronomy](#)
- **LAB:** Know the Phases of the Moon or Die, pp. 49-50. This will be completed as an in-class activity (10 points).
- **THURSDAY'S FOCUS** on understanding the motions of the Moon: Review phases, synodic/sidereal periods, moon illusion, blue moon, moon rotation, changing distance (perigee/apogee), and lunar librations. The reading material will be found in the Popular Misconceptions section, [S-02: Popular Misconceptions](#).
- **ASSIGNMENT:** Finish [BASN Text](#) readings on Popular Misconceptions.
- **ASSIGNMENT:** Study for Lunar Phase quiz as per the practice quiz in the previous week's [Lecture Slides](#). Know the phase that comes before and after the phase being shown on the screen. Download a lunar phase application on your smartphone to practice or randomly self-test by picking slides in the lunar [phase section of the Popular Misconception Lecture Slides](#) and identify. You can also go [here](#) to self-test yourself on lunar phases.

- **YouTube:** [NASA's Lunar Reconnaissance Orbiter—PHASES/LIBRATIONS-2019](#)
View this in preparation for the Phases, Rotation/Distance Librations lab
- **LAB:** [Phases, Rotation/Distances, and Librations](#) of the Moon, pp. 53-62 to be submitted before the end of class (20 points).
- **Tuesday Quiz on Lunar Phases:** (10 points), first activity when class starts.
- [Test your Visual Knowledge of Astronomy](#) if time permits.
- **ASSIGNMENTS ARE DUE ON THE NIGHT OF YOUR CLASS.**

Week Three— Tuesday, Jan. 30/Thursday, Feb. 1: : [S-02: Popular Misconceptions](#) in Astronomy

- **ALWAYS BRING YOUR COMPUTER TO EVERY CLASS.**
- **FOCUS ON THE SEASONS:** Seasons demonstrated via teacher, student, and computer-centered activities. Check out the slide set about [The Seasons](#) that I developed for an all-age audience. Misconceptions about the seasons, insolation with a flashlight, Earth globe demonstrations—straight axis, flipping axis; computer demonstrations using *The Sky* software, students demonstrate the seasons, effects of the seasons—change in altitude, change in the length of the day, and change in the position of sunrise and sunset; 180-degree rule with opposite solstice rise and set positions. There are lots of fun ways to learn about the seasons here at Moravian University.
- **LAB:** The seasons understood using a flow chart.
- **LAB:** *Understanding the Seasons*, using the [Seasons Graph](#) and exercise found in Session Three, [S-03: Archaeoastronomy](#), pp. 127-133. The [Seasons Graph](#) is necessary to complete this exercise.
- **LAB:** *Geometry of the Seasons*—Students will construct a geometrically accurate representation of the seasons using protractors, rulers, and pencils. The lab can be found on page 41 in [S-02: Popular Misconceptions](#) (10 points).
- **We may have enough time to move into the first lesson in Archaeoastronomy.** If we do, we will continue with the laboratory exercise, *Save Your People* pp. 73-74 in your Lab Manual.
- **Self-Test:** [Popular Misconceptions in Astronomy Study Guide](#)
- **ASSIGNMENTS ARE DUE ON THE NIGHT OF YOUR CLASS.**

Week Four—Tuesday, Feb. 6/Thursday, Feb. 8: [S-03: Archaeoastronomy](#)

- **ALWAYS BRING YOUR COMPUTER TO EVERY CLASS.**
- **FOCUS Tuesday:** The Mystery of Stonehenge
- **FOCUS Thursday:** Astronomy and the Ancestral Puebloans.
- **ASSIGNMENT: Top Ten Reasons You Want to Become an Ancestral Puebloan Priest.** The Top 10 was a favorite on the *Late Night Show* hosted by David Letterman many years ago. See if you can adapt his humor to the Ancestral Puebloans living in Chaco Canyon. Here is a preview, [Letterman's Top Ten](#). Work on this assignment

during the week and during class as material is being presented and you garner ideas. Each student should create a minimum of five reasons (5 points) why they would want to become an Ancestral Puebloan priest. More is joy however, because on Tuesday of next week each team will create a combined list of the best top 10 statements from its members and submit that for a grade. I will take all of the top 10 lists and combine them into one or two finalized lists which will then be distributed to the class (10 points).

- **TUESDAY'S LAB:** *Save Your People, Win That Girl*, in class—Sounds a little sexist, but it is probably closer to the truth than most people would like to admit. Chacra Vida knows that if he can create a solar calendar, he will have the opportunity to court and marry the woman of his wildest fantasies, Tsin Kletsin's daughter. This scandalous lab can be found on pp. 73-4 in [S-03: Archaeoastronomy](#). This will be an in class, team effort (10 points).
- **THURSDAY'S LAB:** *Mysterious Pueblo Bonito*, in class, pp. 89-90.
- **ASSIGNMENT-BASN TEXT:** On **Thursday** hand in the exercise, Distill the Definition to Its Basic Meaning in the eclipse section, pp. 211-212. and words to be defined pp. 213-215 in your Lab Manual. Follow the directions precisely.
- PowerPoint: [Lecture Slides](#) Become familiar with these visuals.
- Reading: [BASN Text](#) Don't complete any of the exercises unless assigned.
- Reading: [A Sky for All Seasons, Edwin Krupp](#) It is an excellent introduction to archaeoastronomy.

VIEW AT LEAST TWO OF THE YOUTUBE VIDEOS BELOW.

- YouTube: [A History of the Ancient Southwest \(Lekson\)](#)
- YouTube: Click [here](#): Stonehenge Secrets Revealed | Digging for the Truth
- YouTube: Click [here](#): Unravelling the mysteries of Stonehenge (5 Dec. 2013)
- YouTube: Click [here](#): Solving the Mystery of Stonehenge with Dan Snow
- YouTube: Click [here](#): New Scientific Discoveries: Reinterpreting Stonehenge
- YouTube: Click [here](#): The Mystery of Stonehenge, Part 2 -1965
- YouTube: Click [here](#): Murder at Stonehenge | Timeline
- YouTube: [Standing with Stones - an epic journey through prehistoric Britain & Ireland](#)
- YouTube: [Decoding the ancient astronomy of Stonehenge](#)
- YouTube: [Uncovering the secrets of Stonehenge](#)
- YouTube: [Megalith Movers: Building Stonehenge](#)
- YouTube: [Stonehenge: A 360° View](#) Interactive—move around Stonehenge

VIEW ONE OF THE ITEMS BELOW.

- WWWeb: [Chaco Culture National Historical Park](#)
- YouTube: Click [here](#): *Mystery of Chaco Canyon* (poor quality, great information)
- YouTube: [The Cannibals Of The Four Corners | Timeline](#)

VIEW ONE OF THE FOLLOWING YOUTUBE VIDEOS BELOW.

- YouTube: [Chacoan Astronomy, Cosmography, Roads, & Ritual Power](#)
- YouTube: [EXPLORING CHACO CANYON: History, Information, Hikes, etc.](#)
- YouTube: [Studying Southwestern Archaeology by Dr. Steve Lekson](#)
- YouTube: [What Was Chaco, Really? \(Lekson\)](#)
- Self-Test: [Archaeoastronomy Study Guide](#)

- **ASSIGNMENTS ARE DUE ON THE NIGHT OF YOUR CLASS.**

Week Five— **Tuesday, Feb. 13/Thursday, Feb. 15:** Solar and Lunar Eclipses, [S-05: Eclipses](#)

- **ALWAYS BRING YOUR COMPUTER TO EVERY CLASS.**
- **Teams will complete** Letterman's Top 10 list as to why you would want to become an Ancestral Puebloan priest (10 points).
- **FOCUS ON ECLIPSES:** A total solar eclipse is something that you should put on your bucket list. It is probably the most spectacular astronomical phenomena that you can witness. Conditions which cause solar and lunar eclipses to occur, different types of eclipses, repetition of similar eclipses (saros cycle), visual aspects of solar and lunar eclipses, and how to observe a total solar eclipse will be topics of discussion. Although lunar eclipses, where the moon hides in the Earth's shadow, are different from solar eclipses, where the moon blocks the sun, most of the topics that are applicable for solar eclipses are relevant to lunar eclipses. Therefore, the time spent discussing lunar eclipses will be much shorter than with solar eclipses.
- **Upcoming eclipses:** A very shallow partial lunar eclipse will occur on Tuesday, September 17, 2024. Deepest intrusion into the Earth's umbra will happen at 10:47 p.m. The center line of a total solar eclipse will pass within 300 miles of the Lehigh Valley on April 8, 2024. It will be total in Erie, PA.
ASSIGNMENT: Read pp. 191 to 209 in [BASN Text](#), Session Five, or read [Aspects and Motions of the Moon: Eclipses, George Abell](#).
- **THURSDAY'S QUIZ:** Vocabulary in Session Five, Eclipses—in class—in teams—match the definition with the word on the card—given at the end of the class—be happy! I like to give this quiz after we have talked about eclipses, so depending upon where we are it may be moved to following Tuesday. I'll know by Tuesday's class.
- **EXAM on the introductory material, popular misconceptions, archaeoastronomy, and eclipses.** This test will happen after the conclusion of eclipses. Currently the exam is scheduled for **THURSDAY, November 10**, in class. The exam will be mostly multiple choice and a few fill-in-the-blank questions and be valued between 60-70 points. It will be presented on CANVAS.
- **Self-Test:** [Introduction to Astronomy Study Guide](#)
- **Self-Test:** [Popular Misconceptions in Astronomy Study Guide](#)
- **Self-Test:** [Archaeoastronomy Study Guide](#)
- **Self-Test:** [Solar and Lunar Eclipse Study Guide](#)

View, read, and listen to the following, including two Excitement Videos.

- PowerPoint: [Lecture Slides](#)
- YouTube: [The Moon's Orbit and Eclipses—Launch Pad Astronomy](#)
- YouTube: [You Owe it to Yourself to Experience a Total Solar Eclipse | David Baron](#)
- Excitement: [When Day Became Night: A Special Report on the 2017 Solar Eclipse](#)
- Excitement: [Alaska Airlines: Great American Eclipse Flight #9671](#)
- Excitement: [Total Solar Eclipse \(2017\)](#)
- Excitement: [Space Station Transiting 2017 ECLIPSE, My Brain Stopped Working](#)
- Music: [Bonnie Tyler—Total Eclipse of the Heart](#) (Video)

- Music: [You're so Vain—Carly Simon](#) (Video)
- Self-Test: [Solar and Lunar Eclipse Study Guide](#)
- **In Class Midterm Exam given in Class, Thursday, Feb. 20, 6:30 p.m. to 9 p.m.:** It will be on CANVAS, but given in class, Room 106, Collier.
- **ASSIGNMENTS ARE DUE ON THE NIGHT OF YOUR CLASS.**

Week Six— Tuesday, Feb. 20/Thursday, Feb. 22: Solar and Lunar Eclipses, [S-05: Eclipses](#)

- **EXAM 1 on Tuesday, February 20, 6:30 p.m. to 9:00 p.m.,** Room 106, Collier Hall of Science. The following study guides will prove helpful. This exam could be pushed to Thursday, if the material has not been adequately covered.
- **Self-Test:** [Introduction to Astronomy Study Guide](#)
- **Self-Test:** [Popular Misconceptions in Astronomy Study Guide](#)
- **Self-Test:** [Archaeoastronomy Study Guide](#)
- **Self-Test:** [Solar and Lunar Eclipse Study Guide](#)
- **THURSDAY'S ASSIGNMENTS:** [S-14: Stellar Evolution](#)—Part One/Stellar Distances
- **FOCUS:** We will learn about the general characteristics of hydrogen burning (Main Sequence) stars, how the distances to the stars are found using a new unit of distance called the parsec.
- **Lab:** Calculating Stellar Distances, pp. 479-480 or pp.481-482. The exercise will be completed in class. [Parallax Lab-PDF](#). The emphasis will be on significant numbers.
- Review the rules for significant figures found on page 11 in Session One of the Lab Manual.
- PowerPoint: [Lecture Slides:](#) Through the Distance Modulus
- Reading: [BASN Text:](#) through the Distance Modulus
- YouTube: [Analyzing Starlight Part 1: Brightness—LPA](#)
- YouTube: [#23 Light—Crash Course Astronomy](#)
- YouTube: [#24 Distance—Crash Course Astronomy](#)
- **ASSIGNMENTS ARE DUE ON THE NIGHT OF YOUR CLASS.**

Week Seven— Tuesday, Feb. 27/Thursday, Feb. 29: **SPRING BREAK—NO CLASSES**

Week Eight—Tuesday, March 5/Thursday, March 7: [S-14: Stellar Evolution](#)—Part One/Two, Distance Modulus, Emission Spectrums

- **TUESDAY'S FOCUS:** In order to compare the stars to one another to see if any relationships exist, it is necessary for astronomers to mathematically move a star to a standard distance to understand what its true luminosity (brightness) would be. This is successfully completed by using the distance modulus.
- **LAB:** Finding the Most Luminous Star in the Great Summer Triangle, pp. 485-488, [Great Summer Triangle Lab-PDF](#).

- [Great Summer Triangle Lab-Instructional Video](#). This would be a good lesson to review prior to class.
- **THURSDAY'S FOCUS:** Another way of classifying stars is to understand their temperature. This is accomplished by creating emission spectra in the laboratory, then comparing them to the absorption spectra of the stars astronomers wish to study.
- **THURSDAY'S Lab:** After a short presentation, we will examine emission spectra to determine how elements are verified. Precisely mapping an element or compound in emission in the laboratory leads to the identification of that same element and much more information in distant stars when an absorption spectrum is taken.
- Lab: [Emission Spectrum Lab-PDF](#). This is an in class exercise.
- Lab: [Emission Spectrums to be Identified for Lab-PDF](#)
- Lab: [Emission Spectrum Lab-Instructional Video](#)
- **YouTube Videos for Consideration.** You'll find them helpful in acquiring the information necessary to be successful.
- YouTube: [Light and Temperature Launch Pad Astronomy](#)
- YouTube: [Spectroscopy LPA](#)
- YouTube: [Analyzing Starlight Part 1: Brightness LPA](#)
- YouTube: [Analyzing Starlight Part 2: Colors LPA](#)
- YouTube: [Analyzing Starlight Part 3: Stellar Spectral Classification LPA](#)
- YouTube: [How Stars Work LPA](#)
- YouTube: [Seeing Color: Arbor Scientific |](#)
- YouTube: [Electromagnetic Spectrum: Montana Tech](#)

Week Nine— Tuesday, March 12/Thursday, March 14: [S-14: Stellar Evolution](#)—Part Two-Absorption Spectroscopy/Part Three-Interpretation of a Hertzsprung-Russell diagram.

- **ALWAYS BRING YOUR COMPUTER TO EVERY CLASS.**
- **TUESDAY'S FOCUS:** When light passes from a star, some of its energy is absorbed by the star's atmosphere. This creates an absorption spectrum in which all of the colors of the rainbow (spectrum) are represented, except for the ones that are absorbed. The absorbed wavelengths which appear as dark lines on the continuous spectrum and their intensities in relationship to one another allow astronomers to classify stars with respect to their temperature.
- **TUESDAY'S FOCUS:** If we are running ahead of schedule, we will construct an H-R Diagram from Hipparcos data of the 30 nearest and the 30 most luminous stars.
- **ASSIGNMENTS** are given below.
- PowerPoint: [Lecture Slides](#) through Emission and Absorption Spectrums and the Doppler shift
- Reading: [BASN Text](#): through Emission and Absorption Spectrums
- Lab: [Absorption Spectrum Lab-PDF](#). This will occur in class.
- Lab: [High Resolution Absorption Spectrum](#)—Use this to deduce spectral types.
- Lab: [Absorption Spectrum Lab—Instructional Video](#)

- YouTube: [Light and Temperature—Launch Pad Astronomy](#)
- YouTube: [Spectroscopy—LPA](#)
- YouTube: [Analyzing Starlight Part 1: Brightness—LPA](#)
- YouTube: [Analyzing Starlight Part 2: Colors—LPA](#)
- YouTube: [Analyzing Starlight Part 3: Stellar Spectral Classification—LPA](#)
- YouTube: [How Stars Work—LPA](#)
- Self-Test: [Questions](#): Light and Distance
- **THURSDAY'S CLASS**: This evening is being designated as a catch up night. If I am behind in the syllabus this evening, this time will help get me on track with the lessons. If I am on track, we will proceed to the next lesson.
- **ASSIGNMENTS ARE DUE ON THE NIGHT OF YOUR CLASS.**

Week Ten— Tuesday, March 19/Thursday, March 21: [S-14: Stellar Evolution](#)—Part Three/
The birth and life of stars.

- **ALWAYS BRING YOUR COMPUTER TO EVERY CLASS.**
- **TUESDAY'S FOCUS**: We will discuss the conditions by which stars are born, understand the birth and lives of stars through the interpretation of the Hertzsprung-Russell diagram and through images taken with the Hubble Space Telescope and James Webb Space Telescopes as well as other instrumentation.
- **ASSIGNMENTS** are given below.
- PowerPoint: [Lecture Slides](#) through the Hertzsprung-Russell Diagram
- Reading: [BASN Text](#): through the H-R Diagram but do not including double stars
- YouTube: [HR Diagram Explained](#)
- YouTube: [Module 9 / Lecture 3: The Hertzsprung-Russell Diagram](#)
- YouTube: [Stars and Galaxies: The Hertzsprung-Russell Diagram](#)
- YouTube: [Star Formation—Launch Pad Astronomy](#)
- YouTube: [How the Sun will REALLY Die—Launch Pad Astronomy](#)
- YouTube: [The Smallest Stars in the Universe-Red Dwarfs—Launch Pad Astronomy](#)
- YouTube: [#26 Stars in General—Crash Course Astronomy](#)
- YouTube: [#29 Low Mass Stars—Crash Course Astronomy](#)
- **THURSDAY'S ASSIGNMENTS** are given below.
- YouTube: [How massive stars die - with a BANG!](#)
- YouTube: [Neutron Stars, Pulsars, and Magnetars—Launch Pad Astronomy](#)
- YouTube: [The Physics of Black Holes](#)
- YouTube: [Monster Black Holes](#)
- YouTube: [#30 White Dwarfs and Planetary Nebulae—Crash Course Astronomy](#)
- YouTube: [#31 High Mass Stars—Crash Course Astronomy](#)
- YouTube: [#32 Neutron Stars—Crash Course Astronomy](#)
- YouTube: [#33 Black Holes—Crash Course Astronomy](#)
- Lab Ex: [Determining the Age of Star Clusters-PDF](#). To be completed in class.

- Lab Ex: [Determining the Age of Star Clusters-Instructional Video](#)
- **Second EXAM will be given on Tuesday of next week:** The second exam will be given online on Tuesday, March 26 between 6:30 p.m. and 9 p.m. in class in Room 106 Collier. The basic questions from which the Second Exam will be constructed are given with this self-test link: [Stellar Evolution Study Guide](#). These questions will continue to be revised until the exam is given.
- **ASSIGNMENTS ARE DUE ON THE NIGHT OF YOUR CLASS.**

Week Eleven— Tuesday, March 26/Thursday, March 28: STELLAR EVOLUTION

EXAM/S-06: Telescopes/Observing

- **ALWAYS BRING YOUR COMPUTER TO EVERY CLASS.**
TUESDAY'S FOCUS IS THE STELLAR EVOLUTION EXAM: Study for this test by analyzing the questions found in the [Stellar Evolution Study Guide](#).
- **THURSDAY'S FOCUS: NO CLASS BECAUSE OF THE IMPENDING EASTER RECESS...** This will only occur if the students have made up the required time in previous classes.
- **ASSIGNMENTS ARE DUE ON THE NIGHT OF YOUR CLASS.**

Week Twelve— Tuesday, April 2/Thursday, April 4: [S-06: Telescopes/Observing](#)

- **ALWAYS BRING YOUR COMPUTER TO EVERY CLASS.**
- **END OF SEMESTER'S FOCUS:** This is where the fun begins if you have not had fun in astronomy yet. My goal will be to teach the class about telescopes and making astronomical observations from the Sky Deck, the rooftop observatory of the Collier Hall of Science. Sky watching depends upon good weather conditions, so when the heavens are cloudy or rainy, we will defer to a lesson on instrumentation.
- **TUESDAY'S ASSIGNMENT:** **Submit on Thursday:** Begin the lab exercise, *Identify the Celestial Object*, pp. 271-272 in your Lab Manual (10 points). Submit the sheet containing the definitions of the objects that we will have the opportunity to observe on the Sky Deck. Some of the definitions can be found in the BASN text, while others will have to be Googled. Follow the instructions precisely. Some of the instructions are given in definitions where specific information is requested about the word to be defined. This is not an exercise where you will be reducing a definition to six words or less.
- **TUESDAY'S FOCUS:** The class will make a drawing through a Galileo telescope designed by the International Astronomical Union in celebration of Galileo's construction of a telescope in the autumn of 1609. Optically they are fairly good instruments, but they lack some of the refinements of modern scopes. Students after making their drawings will be allowed to express their frustrations, as well as how they would propose to make their telescopes a better product (10 points).
- **THURSDAY'S FOCUS:** Student's will learn how to operate the hand controllers using the telescopes in class or up on the Sky Deck... If we go up on the Sky Deck, we will learn the full operation of the telescopes that are set up in that location. Please do not wear any open toed footwear. Depending on the warmth of the day, a jacket and head covering, even glove may be required to remain comfortable.
- **Hand In** the definitions for *Identify the Celestial Object*, pp. 271-272.

- **PowerPoint:** Celestial Object ID
 - **PowerPoint:** [What Makes A Good Telescope?](#) Aperture, focal ratio, light grasp, magnitude/intensity, resolution, Airy disks, constructive/destructive interference, contrast, definition, magnification, field of view.
 - **Video:** *400 Years of the Telescope* if time permits
 - **ASSIGNMENTS ARE DUE ON THE NIGHT OF YOUR CLASS.**
-

Week Thirteen— Tuesday, April 9/Thursday, April 11: [S-06: Telescopes/Observing](#)

- **ALWAYS BRING YOUR COMPUTER TO EVERY CLASS.**
 - **TUESDAY'S ASSIGNMENTS: NO CLASS...** I will be returning from successfully imaging the total solar eclipse of April 8.
 - **ASSIGNMENT:** Read *BASN Text* on telescopes and review *Lecture Slides* on telescopes. Do not complete any exercises unless assigned.
 - **ASSIGNMENT:** Read [Telescopes in General, Neale Howard](#).
 - **ASSIGNMENT:** Read [Telescopes in Particular by Neale Howard](#).
 - **ASSIGNMENT:** Read [Appendix-4: Syncing Mount and Telescope to Sky](#)
 - **ASSIGNMENT:** View all **YouTube** videos down to, but not including, the Skynet PowerPoint presentations and *Bart's Comet*. YouTube:
 - YouTube: [#6 Telescopes: Crash Course Astronomy](#)
 - YouTube: [Telescopes: A Buyer's Guide - The Night Sky -](#)
 - YouTube: [Tips For The First-Time Telescope Owner - The Night Sky -](#)
 - YouTube: [Choosing Your First Telescope" with J. Kelly Beatty](#)
 - YouTube: [How to use an Equatorial Mount for Beginners](#)
 - YouTube: [How to Align a Finderscope for New Astronomers](#)
 - **THURSDAY'S ASSIGNMENT:** Begin the lab exercise, *Identify the Celestial Object*, pp. 271-272 (10 points). The celestial objects to be identified can be found here, [Identify the Celestial Object](#), or on the bulletin board to the left of the Room 106 entrance in Collier. Use the definition sheet that you completed last week to help to identify correctly the objects pictured (10 points).
 - **THURSDAY'S FOCUS:** Observing on the Sky Deck
 - **Alternate Activity:** Video, *400 Years of the Telescope*
 - **ASSIGNMENTS ARE DUE ON THE NIGHT OF YOUR CLASS.**
-

Weeks Fourteen and Fifteen— Tuesday, April 16/Thursday, April 18 and Tuesday, April 23/Thursday, April 25: [S-06: Telescopes/Observing](#)

- **ALWAYS BRING YOUR COMPUTER TO EVERY CLASS.**
- **FOCUS:**
 - Observing on the Sky Deck, weather permitting.
 - Dark Sky observing field experience.
 - Economizing the telescope: Understanding how telescopes can be made more compact. [History, Economizing, and Identifying Telescopes](#) can be previewed as a class video.

- Demonstrating the operation of Moravian's telescope on the Sky Deck, weather permitting.
- Aperture, focal ratio, light grasp, magnitude/intensity, resolution, Airy disks, constructive/destructive interference, contrast, definition, magnification, field of view. Available as class video, [What Makes A Good Telescope?](#)
- If we complete all lessons in instrumentation, I have a number of experimental labs that we will tackle.

- **LABS:** Identifying different types of telescopes and mounting systems, [BASN Text](#) on pp. 257-258 (17-20 points total). After a PowerPoint presentation, students will first identify the different types of telescopes and mounting systems that can be found in Room 106, then complete the laboratory exercise.
- **ASSIGNMENT:** Review [The Simpsons: Bart's Comet](#) in the video section of telescopes.
- **QUIZ ON BART'S COMET:** This will not occur until we have discussed the different types of telescopes and mounting systems.
- **ASSIGNMENTS ARE DUE ON THE NIGHT OF YOUR CLASS.**

Week Sixteen—Tuesday, April 30 only: The third exam will be given online via CANVAS, but in class between 6:30 p.m. and 9 p.m. The basic questions from which the Third Exam will be constructed are given with this self-test link: [Instrumentation Study Guide](#). These questions will continue to be revised until the exam is given.

HALLELUIAH, IT'S THE END! Happy Summer

Last Update: January 4, 2024



If your actions create a legacy that inspires others to dream more, learn more, do more, and become more, then you are an excellent leader.”

—DOLLY PARTON

ASTRONOMY SURVIVAL NOTEBOOK

MORAVIAN UNIVERSITY ASTRONOMY STUDENT FOREWORD

ASTRONOMY, as the author of this book teaches it, is an elective course designed for nonscience majors at the undergraduate university level who have always wanted to know more about the universe in which they live. The significant areas of focus will include:

- A thorough understanding of the sky and its motions.
- Using telescopes and making astronomical observations.
- The life history of stars.

Solar system topics will be considered if time permits. Many topics come into play when those three focus areas are considered. The syllabus will show specific lessons that outline the order in which course materials will be presented during the semester.

I can't entirely agree with how astronomy is taught at the university level. Most professors attempt to teach the subject in its entirety, glossing over discussions, such as the night sky, astronomical misconceptions, eclipses, lunar phases, and the seasons—practical topics that should be known and understood if a person is considered well educated. As a result of simply completing the text by the end of the course, no topic, concept, or idea is covered in sufficient depth or with enough repetition for it to become permanently digested by the average student. In addition, many topics become purely exercises in mathematical analysis, with the instructor completing the lesson to an audience tuned out and turned off. Mathematics is a vital tool for students majoring in astronomy, but not necessarily for individuals taking astronomy for the first time as an elective. Yes, there will be some math, but I promise with your cooperation to get you through it. I will concentrate on fewer topics, cover them to a greater depth of understanding, and reinforce information with appropriate activities and visuals. This approach will lead students to understand better the underlying principles and methodologies guiding all scientific inquiry.

I like to think of astronomy as "the beautiful science." Aesthetics has always been the chief motivator for my lifelong fascination with the heavens. Because of astronomy's inherent visual appeal and the mysteries surrounding distant places, I became interested in understanding the science behind the pictures I viewed as a kid and a young adult. It has been a journey that started back in the late 1950s when, as an 8-year-old, I witnessed a bright shooting star flash across an inky sky on a cold, windy autumn night as I was making my way to a neighborhood Cub Scout meeting.

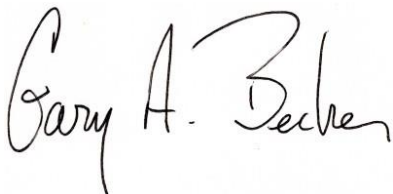
This text and the astronomy course in which you are enrolled continues to evolve. All lessons are now online on my homepage, www.astronomy.org. Students are encouraged to consider this book as a working copy and make suggestions for improvement. If you

find an error here or in my online sources, please take the time to tell me about it. I am never offended by students attempting to improve this class's academic landscape. Although the lessons are mainly descriptive, they often have analytical aspects, including some mathematics. Don't panic about this fact. We will complete it together, and you will understand what is happening. Keep a positive attitude, ask lots of questions, follow my suggestions and instructions, and complete work on time and in an orderly and neat fashion, and you will be on the fast track to a successful experience in this course.

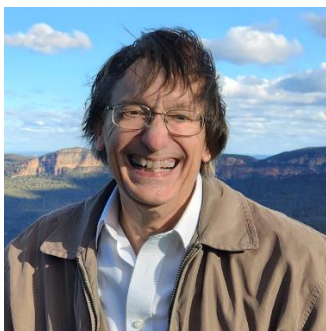
To get the most from this program, I have a website titled astronomy.org, which should help contribute to the enjoyment and assimilation of the instructional material. The links associated with *Moravian University Astronomy* can be accessed [here](#) or by clicking the Sky Deck picture on my homepage. [Astronomy](#) Links, [Weather](#) Links, [StarWatch](#), and [Astrophotography](#) are particularly useful. I also recommend the online astronomy articles on [Wikipedia](#) as helpful and generally well-written. Although the Internet can be an excellent tool for gaining valuable and particularly timely information about astronomical topics, there is a catch. Much of the general online material has no peer evaluation, can be opinionated, and is often laced with errors. Readers, beware!

Thank you for perusing my intentions for the curriculum and how I would like to instruct my class by having read the *Student Foreword*. I wish everyone much success as we journey together through this universe and the contents of this course.

Ad Astra!



Gary A. Becker
Moravian University Astronomy
January 4, 2024



Gary A. Becker, happy in Australia after viewing the April 20 total solar eclipse.

*** BECKER'S ***

ASTRONOMY SURVIVAL NOTEBOOK

General Course Information and Classroom Routine

DESCRIPTION OF CURRICULUM: ASTRONOMY is a course designed for individuals who have always wanted to explore the universe around them. Topics of discussion will include lessons on astronomical misconceptions, archaeoastronomy (astronomy of the ancients), eclipses, instrumentation, the life and death of stars, and if time permits, the evolution and characteristics of the solar system. Students will also gain familiarity with the heavens through possible planetarium visits and observations of the real sky on Moravian's Sky Deck on the fifth floor of the Collier Hall of Science.

COURSE OBJECTIVES:

1. To provide students with an accurate up-to-date informational portrait of the science of astronomy. LinC-2, 4, 6
2. To show the validity of the process of science in problem-solving situations. LinC-1
3. To differentiate between qualitative and quantitative approaches to understanding astronomy. LinC-3
4. To demonstrate the interdisciplinary nature of astronomy as it relates to other branches of science, mathematics, and the humanities. LinC-5, 6
5. To provide students with the opportunity to become familiar with the many facets of the night sky through planetarium demonstrations, computer simulations, real-time, and remote observations of the heavens. LinC-5
6. To provide the type of classroom experience in which a nonscience oriented individual feels that he or she has the opportunity to succeed. LinC-1-6

Moravian LinC Student Outcomes

1. Understanding of and ability to conduct the scientific method
2. Understanding about the fabric and the substance of the particular scientific discipline
3. Understanding of the quantitative and qualitative aspects of that scientific discipline
4. Awareness and appreciation of change within that scientific discipline
5. Awareness and appreciation of the role of creativity within that scientific discipline
6. Awareness and appreciation of some broad implications of that scientific discipline

GRADING PROCEDURE: Students' semester grades will be determined by the number of points accumulated, divided by the total number of points possible. An attendance grade will be part of this formula. A participation grade will then be added to this numerical percentage to produce the final grade. Semester grades will be accrued from the following criteria:

1. **Examinations:** There will be three examinations. **They will not be cumulative.** The first exam will occur around the traditional Moravian midterm date. The second test will follow after the completion stellar evolution. The third exam will happen on night of the final exam. The tests will be mainly objective in nature and compiled from classroom discussions, field experiences, observing sessions, and reading assignments. **The exams will be difficult** and will account for about one third of your final grade. If warranted, grades in an exam will be scaled upward to a mid-C, a 75 percent. Grades will never be scaled downward. Generally, a student's cumulative grade goes down after an exam, so it is very important to attend class regularly and perform well in quizzes and daily laboratory exercises which are easier. **Grades will be scaled.**

2. **Quizzes:** Numerous announced and a few unannounced quizzes will be administered during the semester. Each quiz will be approximately 10-20 minutes in length and usually consist of questions that will be answered in written form. **Grades will never be scaled.**
3. **Laboratory Exercises:** Laboratory exercises will be assigned to students as classwork and some as homework assignments. **Accuracy, clarity of presentation, and neatness** will be used as criteria for grading purposes. When graphs or drawings are submitted for grading, the following weights will be assigned: accuracy (60% of grade), labeling (20% of grade), and neatness (20% of grade).
4. **Participation:** If you have a question and do not ask it, you do yourself and me a disservice. Your chances of learning specific concepts are diminished, and I get a false sense of accomplishment, neither of which is good. **Your participation is genuinely encouraged, and it will be rewarded in your final grade by as much as five percentage points.** It becomes boring if information is flowing from only one direction. Class attendance, taking notes, even looking attentive is not considered class participation. **Students have a responsibility to assist in keeping classes interesting and dynamic.** This will help me to achieve at my greatest potential as an educator. Some of the criteria for appropriate participation follows:
 - a. In non-testing situations, helping others who may be having difficulty in understanding conceptual ideas, performing demonstrations, or working mathematical exercises. Those who have more to give, need to give more.
 - b. Asking and answering questions during classroom presentations and laboratory exercises.
 - c. Being a team player or becoming a team leader.
 - d. Assisting your instructor with improving his astronomy lessons, his *Astronomy Survival Notebook*, and lab manual, his website through constructive criticism or in noting errors.
 - e. Staying with your partner in any situation where you may have finished first but your colleague is still working on the assignment. Just because your work is completed does not release you from your obligation to help others.
 - f. Students who are willing to become field trip drivers.
 - g. Attendance does not count as participation.
5. **Free Points:** Students can accumulate free points from the “What is it?” questions, competitive exercises which occur during lessons, disclosing errors in this book, and other positive contributions which improve the educational value of the material being taught in this course. These points are added only to the numerator (top part) of the final grade fraction.
6. **Work that is late** will receive a lower grade than work that is submitted on time. Failure to complete assignments within a reasonable interval of time will result in a much-reduced grade or a grade of zero being assigned to that work.
7. **Absenteeism:** Students are responsible for making up all missed work within a reasonable time interval when legally absent. Pupils who have illegal absences (unexcused), depending upon circumstances, may **not** be granted the same privilege of completing missed work for a grade.
8. **Qualitative Assessments:** It is within the instructor’s purview to apply qualitative judgement in determining grades for an assignment or for a course. A practical application of a qualitative assessment would be in class participation.
9. **Extra Credit:** No extra credit will be allowed this semester.

10. **Lost Loaned Materials:** A student will not receive a final semester grade unless the total cost of any missing material loaned to that student is remitted. This does not include the *Astronomy Survival Lab Manual*.

Determination of Semester Grades: Scaled examination scores, quizzes, class participation, attendance, free points, and laboratory exercises will determine semester grades. Participation could add as many as five percentage points to a semester grade. Moravian's +/- grading policy will be adhered to as noted below:

	A $\geq 93\%$,	A- $\geq 89.5\% < 93\%$,
B+ $< 89.5\% \geq 87\%$,	B $< 87\% \geq 83\%$,	B- $\geq 79.5\% < 83\%$,
C+ $< 79.5\% \geq 77\%$,	C $< 77\% \geq 73\%$,	C- $\geq 69.5\% < 73\%$,
D+ $< 69.5\% \geq 67\%$,	D $< 67\% \geq 63\%$,	D- $\geq 59.5\% < 63\%$,
F $< 59.5\%$		

Students always have a right to know their grades. Grades will normally be available for inspection prior to or after class. I do not use Canvas for grading purposes, except for exams. Know the six key numbers of your ID because grades will never be shown along with names.

Notebook Information:

1. **Your *Astronomy Survival Lab Manual* will be brought to every class except on dates when off-campus field experiences are scheduled.**
2. Each student is required to keep a notebook containing all of the information that is given in class and any materials otherwise assigned. Your online *Astronomy Survival Notebook* and **Lab Manual** should serve this purpose well. They are your main texts for the course.

Bring to each class your *Astronomy Survival Lab Manual*, your personal computer or notepad, a pencil, a pen, a calculator, and a flashlight. Smart phones may qualify for the latter two applications, except during exams.

Attendance Policy and how it can influence grades: This course is specifically designed to encourage students to practice good attendance habits. Everyone wants an "A." It has no chance of happening if you don't attend classes.

Students will sign in when they arrive to class. Students are expected to attend all classes, to be on time (6:30 p.m.), and to be in a state of preparedness regarding the instructional material. Students will receive a bonus of **10 free points** if they are present for all classes. Excused absences will receive a bonus deduct of four points for the first absence and three points thereafter until a zero is attained. **Students with additional excused absences will see no further reduction in points to affect their grade.** To avoid a penalty from an unexcused absence, pupils will be expected to provide documented proof about the reason for the absence when they return to class. The excuse must be valid for the day(s) of absence. To assist in expediting this process, students may use the *Medical Excuse Note Policy* form that can be found in the *Student Information* section of their *Astronomy Survival Notebook* or email your instructor prior to class. Students should be aware that an excused absence does not have to be for medical reasons, but it does have to be verifiable. **Please note that if you skip class after signing in,** your instructor will consider your absence unexcused for the entire class period. If you need to leave class for a valid reason, speak to your instructor. The penalty structure for unexcused absences will be as follows:

Attendance, cont.

Classes Missed:	0	1	2	3	4	5	6	EVENT	7	BLACK HOLE
Reward/Deduct:	+10	-1	+ -2	+ -4	+ -8	+ -16	+ -32	HORIZON	-64	OF DEATH
Total Penalty Applied	-1	-3	-7	-15	-31	-63			-127	--YOU FAIL--

Students who have an unexcused absence receive a zero for worked missed during that class period and may not be allowed to make up work for a grade. You miss class and you miss out!

Contact your instructor beckerg@moravian.edu if you are going to be absent or late to class so that he knows where you are. It makes for a smoother running class and for a better student-teacher relationship when pupils are proactive. This, may count as your excuse for being absent depending upon your rate of absences.

Being late habitually will cost a student attendance points depending upon the circumstances surrounding the tardiness. Normally, three late class appearances equal one excused or unexcused absence depending upon the circumstances.

Academic Code of Conduct: This will be followed as per the Moravian University Student Handbook and online resources at, <https://www.moravian.edu/catalog/academic-regulations/academic-code-of-conduct>. Put in very plain English... **If you cheat and you get caught, and you are found guilty by the Academic Standards Committee, you could fail the entire course.** You may be forced by Moravian University to change your major, particularly if you are planning a career in education. I treat cheating seriously and will **aggressively pursue** those students who I can prove are academically dishonest. I invite students to do the same if they see someone cheating in class.

Laptops/ Smart Technology: Bring your laptops and smart technology to every class. Understand that they must be used in an academically honest manner. If your instructor tells you that you can no longer bring your computer to class because of a breach of protocol, that sanction may apply for the entire semester.

Confiscation of Smart Technology: Your instructor has the right to remove from your possession smart technology including laptop computers, smart watches, smartphones etc., that are being used inappropriately. Any confiscated device will be returned to the student at the end of the instructional period.

Smart Phone/Smart Watch Policy: **Please silence your smart devices when in class.** Unless you are using smart phone/watch technology for an astronomy-related activity, they should be kept in a quiet mode. Examples of permissible uses of a smart technology in class are to look up information pertinent to the ongoing discussion, viewing the lecture slides during presentations, the use of an astronomy application such as atomic time, as a calculator in a non-testing situation, as a translator for International Students, or as a flashlight when going outside to observe. Emergencies do happen, so if you need to use your smart technology for a private communication during class, kindly inform your instructor about this situation, and please feel free to leave the classroom to make your call. **I consider texting during class time to be impolite behavior.** During non-testing breaks, the use of smart technology is permitted. Consider the educational process as being similar to live theater. The actors (instructors) and

audience (learners) need to communicate effectively and support each other in order to understand the plot fully. Inappropriate use of smart technology, impedes that process.

No Student Electronic Recording of Class Presentations will be Allowed Unless Specifically Approved by Moravian Administration or Gary A. Becker. That includes audio and video with any type of recording device. Lesson videos are available at [here](#) in the appropriate chapter (session) locations.

Astronomy Classes or Varsity Sports/Music Rehearsals/Club Events: You chose this class at this time period. Your first responsibility/priority is to be in astronomy class. Speak to your instructor if there is a problem. He will try to propose solutions.

No Time to Eat Between Classes? I expect students to have had something to eat prior to class, but I am also aware of the fact that some classes such as choir rehearsals and particularly athletic practice give students very little time to have dinner before class. If you fall into this category, grab something to eat at the HUB or another location and come directly to class so you can eat your meal and also be on time when astronomy class begins.

Snacks and Beverages: There will be no snacking in class unless it is a medical necessity. You will be expected to provide authentication from a physician or the Health Center if you fall into this category. The preferred drink of choice is water, but I will be a little more tolerant here. If you spill a drink, please be considerate of others and clean up the spill completely. Remember those sticky floors in movie theaters? I don't want that in Room 106.

Astronomical Observation Sessions: Quite frequently when the weather permits, class observations will be made from the Collier Sky Deck to view the International Space Station or other events. These will be short in duration. Conditions on the Sky Deck can be windy and cold, especially during late fall and early spring. On clear nights when longer observing sessions will be held, students are expected to bring to class the extra clothing protection needed for head, hands, and feet in addition to the normal outdoor winter clothing worn during the cold seasons.

Class Length and Breaks: Classes are from 6:30 p.m. to 9:30 p.m. Breaks will be on a need to have basis. During times when a break does not occur or pupils choose not to have a break, students will be compensated for any extra time spent in class with a free night where no class will be held. A minimum of 160 extra minutes of instruction must be accumulated for this to happen. Some classes such as observational sessions, will go beyond the normal class length.

Style of Classroom Presentations: I like to keep classes lively and fresh with a free and open exchange of information between students and teacher. If you feel uncomfortable with a specific aspect of my teaching style, please let me know privately so that we can discuss this matter to possibly adjust my presentation techniques.

Faculty Withdrawal of Students NOT Attending Class: Prior to the announced last day for students to withdraw with a "W," instructors may request an administrative withdrawal for a student who has been absent from class without notification for a period of three weeks or more. The request will be submitted to the registrar in writing. [NOTE: Emails count as writing.] The registrar will then consult with one of the academic deans on the appropriateness

of the request. If a student's status changes from full-time to part-time as a result of the administrative "W," the bursar and financial aid offices will make appropriate adjustments to the student's account for the time period involved. Students who are absent with notification [for example, they are in the hospital and the instructor has been notified] may not be withdrawn by the instructor.

Students with Disabilities: Moravian University strives to create a learning environment that is accessible to all students. If you are experiencing or anticipate experiencing disability-related barriers to learning in your courses, you should contact the Office of Disability and Accommodations (ODA) at oda@moravian.edu. If you are registered with ODA and have a current accommodation letter, please share your letter with your instructor as soon as possible so that we can discuss how your adjustments will be implemented in this course. To receive any academic accommodation that is not granted or offered to all students equally, you must be registered with ODA. The ODA works with students confidentially and only discloses disability-related information on a need to know basis or with the student's permission. To contact the Office of Disability and Accommodations (ODA), located in the lower level of the HUB, call 610-861-1401, or email oda@moravian.edu.

Title IX, Discrimination Statement: Moravian University faculty are committed to providing a learning environment free from gender and sex-based discrimination, including sexual harassment, domestic and dating violence, sexual assault, and stalking, in accordance with Title IX of the Education Amendments of 1972. As such, Moravian University designates all faculty members as mandatory reporters of such disclosures to the Equal Opportunity and Title IX Coordinator, who will reach out to offer resources, support measures, and information. Reports can be made online anytime at www.moravian.edu/titleix. Please note that reported information remains private and that the student is not obligated to respond to outreach.

Although disclosures of gender and sex-based discrimination or sexual violence made in relation to an assignment and/or educational prompt do not require referral, faculty are encouraged to consult the Equal Opportunity and Title IX Coordinator for guidance on how to follow up with their student.

Fully confidential reporting options include licensed professionals in the Counseling and Health Centers, as well as the chaplains in Spirituality and Inclusion. Survivors are encouraged to seek immediate assistance by contacting the Advocates at (484) 764-9242. For more information, including grievance procedures, please view the Equal Opportunity, Harassment, and Non-Discrimination Policy at www.moravian.edu/policy/harassment-discrimination.

Writing Center: All members of the Moravian University community are welcome to visit the Writing Center. Writing Center consultants work with papers and multimodal compositions for any class, at any stage of the writing process. If you need the services of the Writing Center, please visit moravian.mywconline.com to make an appointment. The Writing Center is located on the second floor of Zinzendorf Hall, a building that is not accessible to persons with mobility impairments. If this impacts your ability to use the Writing Center, we will gladly make arrangements to meet with you in an accessible location.

Use of Artificial Intelligence: Students are encouraged to use ChatGPT and

other AI tools to support their learning, understanding, and creative processes during the coursework. However, AI tools should be utilized responsibly and ethically, adhering to the academic principles of academic honesty and originality.

Your Teaching Assistant will be Anthony Sparrow, sparrowa@moravian.edu. This will be Anthony's first semester in that capacity and unfortunately his last, since he is graduating in May. Anthony took PHYS-108 in the fall of 2023. Take advantage of his expertise in astronomy, the manner in which your instructor runs his classroom, and navigating university life in general. He is a very competent person and happy to provide assistance.

About Your Instructor:

Name: Gary Arthur Becker

Contact: **Mobile: 610-390-1893** / Moravian Office: 610-861-1476

Email: beckerg@moravian.edu or garyabecker@gmail.com

Home Page: [www.https://astronomy.org/](https://astronomy.org/) (Moravian University Astronomy);

Education: William Allen High School (1968),
Kutztown University (1972): BS (Sec. Ed.-Earth and Space Science/Geography)
West Chester University (1984): MA (Astronomy/Geology),

Hobbies: Astronomy, photography/astrophotography, writing, traveling

Teaching Positions: Allentown School District Planetarium (38 years), Kutztown University, Penn State University, Lehigh Carbon Community College, Moravian University (14 years)

Memberships: Mars Society, Lehigh Valley Amateur Astronomical Society, Inc., Pennsylvania Earth Sciences Association.

Personal Philosophy of Education: The educational process should be enjoyable. Ideally, pupils should want to attend classes because of their own innate curiosities. Teachers should try to create a classroom atmosphere in which the student feels emotionally at ease while at the same time learners are being academically challenged.

Student Responsibilities: Students should make an honest attempt to grasp the lessons and homework assignments. In class, pupils should play an assertive role in trying to gain familiarity with the subject material. Most importantly, a student should be honest with himself, his peers, and his teachers. In other words, no B.S., please!

AND THE REST WE WILL MAKE UP ALONG THE WAY, if necessary.

NEED HELP? Please feel free to stay after class or arrive before class if you need extra help. If you are ill, or are going to be late for class you are responsible for contacting your instructor to see what you have missed. I can be reached at 610-390-1893 (mobile) or beckerg@moravian.edu or at garyabecker@gmail.com. Don't forget, PHYS-108 also has a teaching assistant who is more than capable of providing extra help if needed.

FORMULA FOR SUCCESS in Astronomy PHYS-108, Moravian University Astronomy:

Since you made it to Moravian, you should know this already!

1. **Complete the exercises in your *Astronomy Survival Notebook* when assigned.** Skim through the chapters before they are discussed in class, so that you will know what is considered important. Then read them again after the class presentation. Answer the questions in the back of each chapter or review the lessons via the online lecture videos.
2. **Use your *Astronomy Survival Notebook*, Class Videos, YouTube Videos, Reeves Library, your instructor, teaching assistant, and as resource avenues.** I am ready and willing to assist you in any reasonable way to help your success in this course. In addition, you have Julia Shively as your teaching assistant willing to help you. So, there is no excuse. Astronomy has been my life's vocation, as well as my hobby starting in Third Grade, and I want this to be a positive experience for both you and for me.
3. **Possess some mathematical skills** (at least through algebra). Don't be afraid of math. It's not my favorite subject either.
4. **Study for exams** over a period of several days.
5. **Review the lecture slides** [here](#). Remember that a picture is worth a thousand words.
6. **Participate** in classroom activities, take notes, and ask questions when in doubt. In other words, be an active learner and a team player.
7. **Complete assignments on time** and laboratory exercises in a neat and orderly fashion. If I can't read it, I can't grade it.
8. **Attend class** regularly. You miss class, you miss out, and your grade will suffer—**guaranteed!**
9. **Communicate with your instructor** to keep him in the loop if there are problems or you are absent.
10. **Practice the Golden Rule: Do unto others as you would have others do unto you.** Treat me with respect, and I will have no trouble returning the same favor to you. Cooperation and community are essential aspects of the learning environment in my classroom.
11. **The Moravian University Academic Code of Conduct applies to all students, but especially to those who feel that cooperation, responsibility, respect, and tolerance ARE NOT important to the educational process.** Kindly remember that **EDUCATION IS NOT A DEMOCRACY**, but it does not have to be an autocracy either.



Moravian University faculty are committed to providing a learning environment free from gender discrimination and sexual violence. Should a student disclose a concern of this nature, the faculty member is obligated to inform the Title IX Coordinator, who will assist the student in determining resources for support and resolution. Fully confidential reporting options include the [Counseling Center](#), [Health Center](#), and [Religious Life](#) (chaplain). Survivors are encouraged to seek immediate assistance by contacting the [Advocates](#) at [\(484\) 764-9242](tel:4847649242). For more information, please visit www.moravian.edu/titleix.

January 5, 2024

NOTES

2024 Calendar

January							February							March						
Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa
31	1	2	3	4	5	6	28	29	30	31	1	2	3	25	26	27	28	29	1	2
7	8	9	10	11	12	13	4	5	6	7	8	9	10	3	4	5	6	7	8	9
14	15	16	17	18	19	20	11	12	13	14	15	16	17	10	11	12	13	14	15	16
21	22	23	24	25	26	27	18	19	20	21	22	23	24	17	18	19	20	21	22	23
28	29	30	31	1	2	3	25	26	27	28	29	1	2	24	25	26	27	28	29	30
														31	1	2	3	4	5	6

April							May							June						
Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa
31	1	2	3	4	5	6	28	29	30	1	2	3	4	26	27	28	29	30	31	1
7	8	9	10	11	12	13	5	6	7	8	9	10	11	2	3	4	5	6	7	8
14	15	16	17	18	19	20	12	13	14	15	16	17	18	9	10	11	12	13	14	15
21	22	23	24	25	26	27	19	20	21	22	23	24	25	16	17	18	19	20	21	22
28	29	30	1	2	3	4	26	27	28	29	30	31	1	23	24	25	26	27	28	29
														30	1	2	3	4	5	6

July							August							September						
Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa
30	1	2	3	4	5	6	28	29	30	31	1	2	3	1	2	3	4	5	6	7
7	8	9	10	11	12	13	4	5	6	7	8	9	10	8	9	10	11	12	13	14
14	15	16	17	18	19	20	11	12	13	14	15	16	17	15	16	17	18	19	20	21
21	22	23	24	25	26	27	18	19	20	21	22	23	24	22	23	24	25	26	27	28
28	29	30	31	1	2	3	25	26	27	28	29	30	31	29	30	1	2	3	4	5

October							November							December						
Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa
29	30	1	2	3	4	5	27	28	29	30	31	1	2	1	2	3	4	5	6	7
6	7	8	9	10	11	12	3	4	5	6	7	8	9	8	9	10	11	12	13	14
13	14	15	16	17	18	19	10	11	12	13	14	15	16	15	16	17	18	19	20	21
20	21	22	23	24	25	26	17	18	19	20	21	22	23	22	23	24	25	26	27	28
27	28	29	30	31	1	2	24	25	26	27	28	29	30	29	30	31	1	2	3	4

2023-2024 ACADEMIC CALENDAR**FALL TERM****Term Begins****Add/Drop Ends**

Labor Day (Classes held, Offices open)

Heritage Day (Classes held after 4pm)

Fall Break (No Classes held)

Midterm Grades Due

Spring/Summer '24 Priority Registration Opens

Last Day for Course Withdrawal 'W'

Thanksgiving Break (No Classes held)

Classes End

Reading Day

Final Examinations

Final Grades Due

Monday, August 28, 2023**Friday, September 1**

Monday, September 4

Wednesday, September 20

Saturday, Sept. 30 – Tuesday, October 3

Friday, October 13 by 12:00pm (noon)

Monday, October 23

Friday, November 3 by 4:30pm Wednesday,

November 22 – Sunday, Nov. 26 Saturday,

December 9

Sunday, December 10

Monday, December 11 – Friday, Dec. 15

Monday, December 18 by 12:00pm (noon)

WINTER SESSION (2 Weeks)**Term Begins****Add/Drop Period**

Last Day for Course Withdrawal 'W'

Classes End

Final Grades Due

Tuesday, January 2, 2024**First Day of each Course**

Friday, January 5

Saturday, January 13

Monday, January 15 by 12:00pm (noon)

SPRING TERM**Term Begins**

Martin Luther King Day (No Classes held)

Add/Drop Ends

Spring Break

Mid-Term Grades Due

Easter Recess (No Classes, Offices Closed)

Fall '24/Winter '25 Priority Registration Opens

Last Day for Course Withdrawal 'W'

Classes End

Final Examinations

Baccalaureate

Commencement

Final Grades Due

Monday, January 15, 2024

Monday, January 15, 2024

Friday, January 19

Sunday, February 25 – Sunday, March 3

Friday, March, 8 by 12:00pm (noon)

Friday, March 29 – Sunday, Mar. 31

Monday, April 1

Tuesday, April 2 by 4:30pm

Saturday, April 27

Sunday, April 28– Thursday, May 2

Friday, May 3 at 5:00pm

Saturday, May 4

Tuesday, May 7 by 12:00pm (noon)

EXTRA CREDIT ASSIGNMENTS
MORAVIAN UNIVERSITY ASTRONOMY—PHYS-108

NO EXTRA CREDIT WILL BE ALLOWED THIS SEMESTER

Rational: Extra credit assignments are voluntary in nature, student driven, and designed for individuals who are achieving at levels which are considered average or above average. In PHYS-108 that rank is 75.0 percent or higher. Students who are achieving below this grade need to concentrate and improve on the core learning objectives and lab assignments before they may attempt extra credit. Do not consider extra credit until after the first exam.

Extra Credit dividends will be in the form of Free Points, not to exceed more than 5 percent of a student's final grade. Fifteen free points will be considered the base number. This will assume that there are 300 points accumulated during the semester. If there are less than 300 points accrued during the grading period, the extra credit points will not be lessened.

- A maximum of 10 points for the successful completion of the project.
- A maximum of 5 points for turning the completed project into a *StarWatch* article which will be considered for publication.

Suggestions for an Extra Credit Project:

- Term paper: including bibliography, footnotes, library (book/magazine) research, as well as the Internet. The length of the body of the presentation. Excluding citations will be 750-1000 words.
- An art project: Creative art projects should be sophisticated and astronomically accurate. The project must be accompanied by a written explanation, including citations, and the final piece of art must be shown and explained to the class. (Art-Photography Majors/no *StarWatch* article)
- An original musical composition or arrangement: The theme of the composition will have to have an astronomical content, including written objectives, the musical score, a recording of the musical score, and a performance given to the class (Music Majors/no *StarWatch* article).
- An oral presentation about an astronomical topic (15 minutes minimum) including outline, diagrams, illustrations, etc., which could be in the form of a PowerPoint presentation.
- A lesson plan with demonstrable objectives and outcomes given to the class (Education Majors only).
- Construction of an astronomical device or model (10 pts.), with a *StarWatch* article (15 pts.).
- A systematic series of observations of the day or nighttime sky over the period of several weeks (10 points), with a *StarWatch* article (15 pts).
- An original short story with an astronomical theme including bibliography, footnotes, library (book/magazine) research, as well as the Internet (10 points/no *StarWatch* article)
- Your own suggestions, as long as they follow the guidelines, relate to astronomy, or to your planned vocation and astronomy.

Seriousness of Purpose: Since this is a voluntary exercise, students are expected to be purposefully engaged toward achieving a successful end-result for their project. Students who do not apply themselves in a serious fashion to this purpose risk receiving no credit for their efforts. Consider the following as mandatory items:

- Formulating a written thesis statement regarding the chosen topic, presenting this to the instructor, and remaining on task with respect to its fulfillment.
- Keeping the instructor informed of progress during the assignment and implementing suggestions to improve the mission.
- On time completion of the assignment.

NOTES

MINI-TERM PAPER
(Extra credit or as assigned)

1. **Subject:** Any topic that has a direct application to astronomy.
2. **Length:** Two to three pages (750-1000 words).
3. **Format:** Microsoft Word, New Times Roman font, 14 point, double spaced, one-inch margins, bibliography and footnotes where applicable (not included in page count).
4. **Weight:** 15 points which includes a *StarWatch* article.
5. **Grading:** See below.
6. **StarWatch articles** must fit template, New Times Roman font, 12 point, no exceptions.

Name _____ Date _____

Title of Paper _____

Grade: 15 pts. - _____ +/- _____ = _____

Checklist Special Considerations Final Grade

DETERMINATION OF GRADE

W	CLARITY AND ACCURACY:	1. Material organized improperly -----	_____
R		2. Information does not make sense ----	_____
I		3. Out of date information -----	_____
T		4. Incorrect facts, repetitive -----	_____
T		5. Incomplete explanations-----	_____
E		6. No introduction —No conclusion-----	_____
N		7. Proofreading needs improvement-----	_____
		Total point value equals 7-----	_____
	ENGLISH:		
C	8. Spelling errors—Capitalization-----	_____	
O	9. Grammar-Punctuation-----	_____	
M	10. Awkward sentences -----	_____	
M	11. Bibliography style incorrect -----	_____	
E	12. Footnote needed or style incorrect --	_____	
		Total point value equals 5-----	_____
	NEATNESS:		
N	13. Title page missing. -----	_____	
T	14. Paper appears sloppy -----	_____	
S	15. Paper not double-spaced -----	_____	
		16. Paper not typed -----	_____
		Total point value equals 3-----	_____

Special Considerations:

StarWatch 1115 for the week of December 31, 2017

Moravian Donor Attains Immortality

On January 1, 1801 Giuseppe Piazzi (1746-1826), an Italian astronomer on the island of Sicily, was compiling a new star catalog. Piazzi noted the position of a luminary which on the next night was not present. However, a similar star was observed near to the original star's location. Piazzi initially thought that he had discovered a new comet; in fact, it was a new planet. He named it Ceres for the Roman goddess who gave agriculture to humankind. Then another "planet," Pallas, was discovered on March 28, 1802 and then another on September 1, 1804. A fourth "planet" came into telescopic view on March 29, 1807. It became obvious after Pallas that these objects were representative of a new classification of smaller solar system bodies called asteroids (little stars). By the early 1990's there were thousands of them known and a few dozen that had orbits which crossed the Earth's path and could create havoc if they impacted. Then on March 24, 1993, a startling discovery was made by Eugene and Carolyn Shoemaker and David Levy. Calculations showed that Comet Shoemaker-Levy 9 was fragmented and in orbit around Jupiter and would hit Jove between July 16-22, 1994. The enormity of the energy released by the 20 impacting fragments dwarfed all expectations made by professional astronomers and set into motion a concerted effort by experts to discover and map the orbital paths of as many asteroids as possible in the hopes of discovering all Earth-crossing members. Today, we know of over 16,000 of them. Most are negligibly small, about 7000 large enough to create localized damage including the loss of life. Eleven-hundred of them are larger than 0.6 mile and could create real problems if they struck the Earth. The heyday of asteroid discoveries by amateurs was in the late 90's, and it was at this time (1997) that James Robinson Bruton, a former student of Kutztown University astronomy professor and Moravian donor, Dr. Carlson R. Chambliss, discovered two asteroids, one of which he named after Carlson Chambliss. Carlson was also my astronomy professor when I studied at Kutztown University (1968-72). Chambliss has underwritten about half of the funding for Moravian's 25 percent usage time for the MDRS Robotic Observatory near Hanksville, Utah. Jim was also my student teacher at the Allentown School District Planetarium during the fall semester of 1983. His genuine interest in astronomy and his unique perspectives in teaching difficult concepts earned him an evaluation of outstanding. When Jim first observed 23707 Chambliss on October 4, 1997, he was working as a science teacher in Chinle, Arizona on a Navajo reservation. This non-spherical, main belt, silicate asteroid, 7.198 km at its greatest length (4.5 mi.) has an orbital period of 5.53 years. It rotates once every 5 hours, 4 minutes. More importantly, 23707 Chambliss has been modeled photometrically. We know its general shape, and if you would like to see it for yourself, go [here](#). If you are into immortality, having an asteroid named for you is a wonderful way to be celebrated. Congrats, Dr. Carlson R. Chambliss, on this exceptional and deserved honor.

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Moravian University Astronomy - astronomy.org

MORAVIAN ASTRONOMY CLASS ASSIGNMENT AND ACTIVITY SHEET

Due Date	Activity

MORAVIAN STUDENTS: PLANETARIUM/OBSERVING FIELD TRIP DATES

- 1. Date _____ Depart _____ Return _____
- 2. Date _____ Depart _____ Return _____
- 3. Date _____ Depart _____ Return _____
- 4. Date _____ Depart _____ Return _____
- 5. Date _____ Depart _____ Return _____

NOTES

MORAVIAN UNIVERSITY ASTRONOMY
STUDENT INFORMATION SHEET

Today's Date _____

Name _____ Phone _____

Email address _____ Student ID Number _____

Major _____ Fresh/Sophomore/Junior/Senior Age _____ Access to a car? Y / N

Did you take Astronomy PHYS-108 based upon the recommendation of someone else? Y / N

If your answer was "yes," who was that person _____

Hobbies or special interests: _____

Present or proposed career: _____

Reasons for taking this course: _____

Is there anything special in astronomy that you would like to learn while taking this course?

What qualities do you like to see in a teacher? _____

Check the following math courses that you have successfully completed, including those in which you are currently enrolled:

_____ Algebra I _____ Algebra II _____ Algebra III _____ Geometry

_____ Trigonometry _____ Analytical Geometry _____ Calculus _____ Computer Science

Specify other math courses not included above: _____

Specify your attitude towards math: _____

I have read and understand
the information regarding
classroom procedures.

Name _____ Date _____

Print your name _____

MEDICAL EXCUSE NOTE POLICY

Moravian University

Introduction:

A *Statement of Absence from Class* form can be found on the back of this paper or it can be requested by emailing your instructor.

Moravian University Rationale:

This policy is congruent with those campuses nationwide that recognize the adult relationship between university students and their instructors. Attendance/participation policies related to specific courses should be outlined in class syllabi and communicated to students by their instructors. Sickness is only one of the many reasons that a student may not attend class. Ultimately, attending class is the responsibility of a student. The Health Care providers at the Health Center cannot be expected to write excuse notes for illnesses or problems for which we have never provided care. A student request for a note stating “I was sick last week (or last month) and could not attend class” is unreasonable!

Moravian University Policy:

- An excuse note will be written only in a case where the student has been treated by one of our providers and they have deemed it necessary for the student to be out of class. Under no circumstances will the diagnosis be placed on the note unless requested by the student.
- If the illness is over a prolonged period (over 3 days) Learning Services will be notified who then in turn will email each of the student’s professors. Details will only be given with the student’s permission.
- Students frequently have medical, psychological conditions, illnesses or injuries that may cause them to miss class. These situations will be handled individually by our providers if they are involved in their care.
- In the event that a note is required by the professor in cases other than the above circumstances, the following form should be filled out by the student and given to their professors. The Health Center **WILL NOT** be involved.

STATEMENT OF ABSENCE FROM CLASS
Moravian University

1. Student's Name: _____
2. Department/Course: Physics, PHYS-108, Astronomy
3. Date of Absence: _____
4. Instructor: Gary A. Becker
5. Reason for Absence: _____
6. In case of absence due to illness, answer the following:
 - Did you visit the Health Center? _____
 - Did you see another Doctor? _____
 - Doctor's name _____
 - If your answers to (a) or (b) are "NO" please give the name of someone who can verify the fact that you were ill.

Name of person: _____

Phone number: _____

*I certify that the above facts to be true to the best of my knowledge and belief. **I give permission to my professor to verify that the above information is true.** Finally, I understand that I subject myself to disciplinary action in the event the above facts are found to be false.*

Signature: _____

Date: _____

Please be advised that falsifying excuses for an absence from classes, examinations, or other course requirements is considered a violation of the Academic Honesty Policy. Students found to have falsified an excuse will be charged with academic dishonesty. At a minimum, the penalty will be a zero for the assignment in question; however, course failure, suspension, or expulsion from the University, are other possible consequences of falsified absence notes.

MEDICAL EXCUSE NOTE POLICY

Moravian University

Introduction:

A *Statement of Absence from Class* form can be found on the back of this paper or it can be requested by emailing your instructor.

Moravian University Rationale:

This policy is congruent with those campuses nationwide that recognize the adult relationship between university students and their instructors. Attendance/participation policies related to specific courses should be outlined in class syllabi and communicated to students by their instructors. Sickness is only one of the many reasons that a student may not attend class. Ultimately, attending class is the responsibility of a student. The Health Care providers at the Health Center cannot be expected to write excuse notes for illnesses or problems for which we have never provided care. A student request for a note stating “I was sick last week (or last month) and could not attend class” is unreasonable!

Moravian University Policy:

- An excuse note will be written only in a case where the student has been treated by one of our providers and they have deemed it necessary for the student to be out of class. Under no circumstances will the diagnosis be placed on the note unless requested by the student.
- If the illness is over a prolonged period (over 3 days) Learning Services will be notified who then in turn will email each of the student’s professors. Details will only be given with the student’s permission.
- Students frequently have medical, psychological conditions, illnesses or injuries that may cause them to miss class. These situations will be handled individually by our providers if they are involved in their care.
- In the event that a note is required by the professor in cases other than the above circumstances, the following form should be filled out by the student and given to their professors. The Health Center **WILL NOT** be involved.

STATEMENT OF ABSENCE FROM CLASS
Moravian University

7. Student's Name: _____

8. Department/Course: Physics, PHYS-108, Astronomy

9. Date of Absence: _____

10. Instructor: Gary A. Becker

11. Reason for Absence: _____

12. In case of absence due to illness, answer the following:

• Did you visit the Health Center? _____

• Did you see another Doctor? _____

• Doctor's name _____

• If your answers to (a) or (b) are "NO" please give the name of someone who can vouch for the fact that you were ill.

Name of person: _____

Phone number: _____

*I certify that the above facts to be true to the best of my knowledge and belief. **I give permission to my professor to verify that the above information is true.** Finally, I understand that I subject myself to disciplinary action in the event the above facts are found to be false.*

Signature: _____

Date: _____

Please be advised that falsifying excuses for an absence from classes, examinations, or other course requirements is considered a violation of the Academic Honesty Policy. Students found to have falsified an excuse will be charged with academic dishonesty. At a minimum, the penalty will be a zero for the assignment in question; however, course failure, suspension, or expulsion from the University, are other possible consequences of falsified absence notes.

MEDICAL EXCUSE NOTE POLICY

Moravian University

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STATEMENT OF ABSENCE FROM CLASS
Moravian University

13. Student's Name: _____

14. Department/Course: Physics, PHYS-108, Astronomy

15. Date of Absence: _____

16. Instructor: Gary A. Becker

17. Reason for Absence: _____

18. In case of absence due to illness, answer the following:

- Did you visit the Health Center? _____
- Did you see another Doctor? _____
- Doctor's name _____
- If your answers to (a) or (b) are "NO" please give the name of someone who can vouch for the fact that you were ill.

Name of person: _____

Phone number: _____

*I certify that the above facts to be true to the best of my knowledge and belief. **I give permission to my professor to verify that the above information is true.** Finally, I understand that I subject myself to disciplinary action in the event the above facts are found to be false.*

Signature: _____

Date: _____

Please be advised that falsifying excuses for an absence from classes, examinations, or other course requirements is considered a violation of the Academic Honesty Policy. Students found to have falsified an excuse will be charged with academic dishonesty. At a minimum, the penalty will be a zero for the assignment in question; however, course failure, suspension, or expulsion from the University, are other possible consequences of falsified absence notes.

MORAVIAN UNIVERSITY

1200 MAIN STREET
BETHLEHEM, PA 18018-6650
610-861-1300/www.moravian.edu

All PHYS-108 Astronomy Students Must Complete and Sign MORAVIAN COLLEGE WAIVER

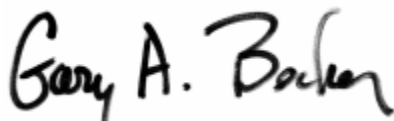
Name of Individual (Print) _____

Description of Activity: Field Experiences related to coursework in PHYS-108 Astronomy

Date of Activity: See PHYS-108 astronomy syllabus where dates and times, including rain dates are given for specific events. Additional dates may be necessary depending upon weather conditions.

Issuing Department: Physics

In consideration of my participation in the activity, listed above, on behalf of myself, my heirs, executors, administrators, successors, or assigns, I hereby release and forever discharge Moravian University, its agents, servants and employees of and from any and all manner of actions, causes of action, suits, damages, claims, and demands, on account of personal injury, including death, or any other cause whatsoever, which I may have against them by reason of or arising out of my participation in the above listed activity. I further release the University from any and all liability relating to expenses arising from my injury that may occur while I am participating in this activity.



Signature of Authorized Representative of the University
Moravian University Astronomy

Date

Signature of Participant

Date

Printed Name of Participant

MORAVIAN UNIVERSITY

1200 MAIN STREET
BETHLEHEM, PA 18018-6650
610-861-1300/www.moravian.edu

All PHYS-108 Student Drivers Must Complete and Sign ACKNOWLEDGEMENT OF RISK

Student Name (Print) _____ Age _____

A student of Moravian University participating in the following activity:

See PHYS-108 astronomy syllabus, where dates, times, and rain dates are given for specific events. Additional times may be necessary depending upon weather conditions.

I will be using my personal vehicle as transportation to and from the above activity. I currently hold a valid driver's license. I understand that in using my own vehicle, I am traveling at my own risk. In the event of an accident, my own auto insurance will be the primary policy which will cover physical damage to my vehicle, as well as bodily injury and property damage to others. I hereby release and forever discharge Moravian University, its directors, agents, servants, and employees of and from any and all manner of actions, causes of action, suits, damages, claims, and demands, on account of personal injury, including, death, or any other cause whatsoever, which I may have against them by reason of or arising out of my participation in the above listed program.

Signature of Student Driver

Date

Printed Name of Student Driver

