



The Solar System (ASTRO 120)

Spring 2022
SCI 04407/L



BALL STATE
UNIVERSITY

Instructor



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Office Hours:

Monday: 4:00pm –7:00pm

Tuesday: 2:00pm –6:00pm

Wednesday: 4:00pm –7:00pm

Thursday: By Email

Friday: 4:00pm –7:00pm

Email me for alternative meeting arrangements.

Required Materials

- Astronomy – OpenStax (Online Text)
 - <https://openstax.org/details/books/astronomy>
- Bennett et al., The Essential Cosmic Perspective, 8th Edition
- Computer Access w/ Internet
- 1 three-ring binder

Meeting Times

MWF: 3PM – 4PM (Class)
T: 7PM – 9PM (Lab)

BSU Credits

Ball State University:
College of Science and Humanities: Department of Physics and Astronomy
Course Credits: 3
Course Name: ASTRO 100

Course Requirements and Specifications

Prerequisite: Algebra I
Co-requisite: Galactic Astronomy Lab (SCI4407L)

Credit: 1.5 credits
Offered: Spring

Course Content Overview

Welcome to Galactic Astronomy!

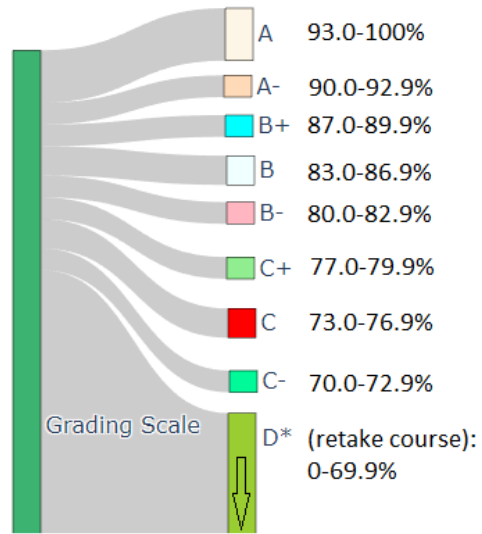
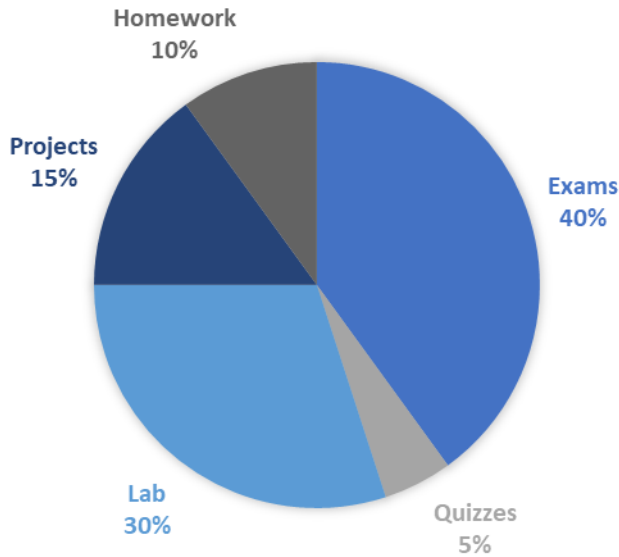
Galactic Astronomy is the second semester of a two-semester introductory course in Astronomy.

This course introduces students to modern astronomy, its historical roots, and its place as a branch of modern physics. Physics topics include gravitation and the motion of celestial bodies, the relation of electromagnetism to light and thermodynamics and their application to astronomy, modern telescopes and their historical roots. Other topics include the structure of the sun and stars, binary stars, the distance to stars, the birth life and death of stars, neutron stars, black holes, the Milky Way, other galaxies, cosmology and the “Big Bang” theory.

Note: In this class, we will not discuss the Solar System or any of the planets in the Solar System. These topics were discussed the fall course Solar System Astronomy. You are not required to take Solar System Astronomy before taking Galactic Astronomy. They may be taken in any order.

* Ball State University offers 3 college credit hours to students in ASTRO 120 to students who complete this course. Refer to the Dual Credit section for details on enrollment and fees.

Grade Calculation & Scale

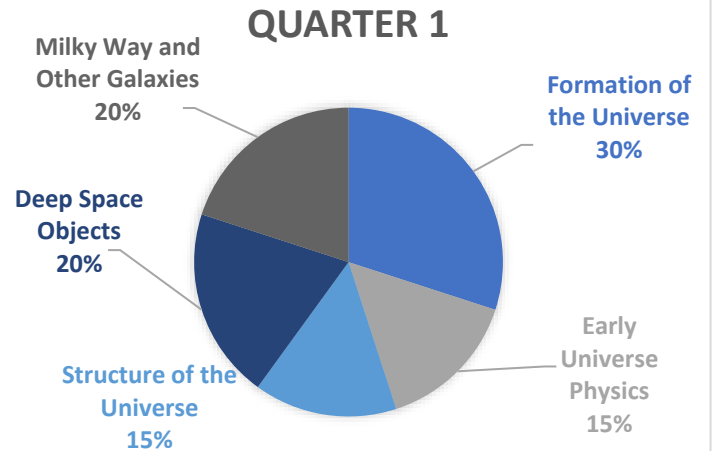


Course Content & Mastery Goals for Exams

Exams, including the final exam, will be parsed into mastery goals for grade calculations. These parsed categories are listed below for the first and second quarters of the semester, respectively. The benefit of assessing and grading in this way is to afford students the opportunity to provide evidence of learning of a concept (such as Spectroscopy) multiple times and not allow previous, less successful attempts to haunt their final grade for the course. A final grade should reflect what a student KNOWS, independent of their journey to get there.

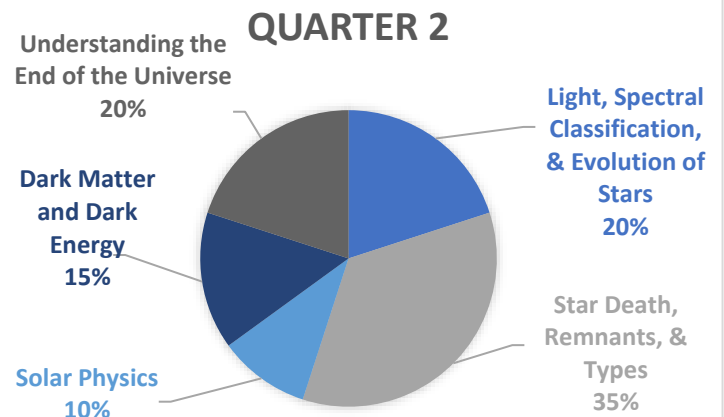
Quarter 1 Concepts

Formation of the Universe	30
Earth Universe Physics	15
Structure of the Universe	15
Deep Space Objects	20
Milky Way and Other Galaxies	20
	100%



Quarter 2 Concepts

Light, Spectral Classifications, & Evolution of Stars	20
Star Death, Remnants, & Types	35
Solar Physics	10
Dark Matter and Dark Energy	15
Understanding the End of the Universe	20
	100%



Spring 2023 Tentative Semester Schedule*

*When Telescope Astronomy (Weather Permitting) Lab Times are not permitted by weather, the class will still meet in usual room

Week	Lecture	Lab
1	Modern Cosmology: Big Bang Theory	The Universe's Timeline Project (Start)
2	Evolution of the Universe (Early Galaxies and Population I, II, and III stars)	The Universe's Timeline Project (Work Time)
3	Current Galaxy Observations Andromeda Galaxy & Milky Way	Galaxy Modeling Lab
4	Current Galaxy Observations Andromeda Galaxy & Milky Way	Galaxy Modeling Lab
5	Galactic Perspective: Stars in Galaxies Orbital Motion (Kepler/Newton/Einstein)	Telescope Astronomy (Weather Permitting)*
6	Spectra: Interstellar Mediums, Star Formation Lyman, Balmer, Paschen, and Brackett Series	Spectral Series and Electron Transitions for Hydrogen Lab
7	Spectra: Blackbodies and Star Classification	Star Classification Lab
8	Stellar Evolution: Beginnings (Interstellar Medium and Star Formation)	Naked Eye Astronomy (Weather Permitting)*
9	Stellar Evolution: Life of a Star (Nuclear Physics: P-P, CNO, and Supernova)	P-P and CNO Cycle Lab
10	NO SCHOOL – SPRING BREAK	NO SCHOOL – Spring Break!
11	Stellar Evolution: Life of a Star (Low, Medium, High, and Super mass stars)	Naked Eye Astronomy (Weather Permitting)*
12	Stellar Evolution: What we know of the end of Stars	The Fate of Our Star Lab
13	Stellar Evolution: What we know of the end of Stars	Adopt a Star Project (Start)
14	Starlight & Spectral Data	Astronomical Data Lab
15	Spectra: Emission & Absorption Doppler Shift & Gravitational Lensing	Interstellar Medium Lab
16	Modern Cosmology: Einstein and Evidence	Telescope Astronomy (Weather Permitting)*
17	Dark Matter & Dark Energy	Telescope Astronomy (Weather Permitting)*
18	Future of Universe and The End? – What it might be – If there is one (Late Work Deadline)	Review for the Final Observation Notebook Due
19	FINALS WEEK	Extra Credit Due

Classroom Policies*

*Subject to change as the need arises.

Laptop Policy

While in class or lab, please keep computer use restricted to classroom-relevant tasks.

Laptops or tablets are required for lab sessions.

Laptops or tablets are also required for some homework, quizzes, and other activities.

Laptops or tablets are permitted but not required during class for note-taking or other class-related needs.

Withdrawal Deadlines

If you wish to drop your class(es), you must do so by August 26, 2022.

The withdrawal deadline is October 2022 and will be announced once published by the University Registrar.

Dropping/Withdrawing from a class at your high school does not drop/withdraw you from your BSU Dual Credit class. Instructions for dropping/withdrawing can be found in the Dual Credit Student and Parent Handbook.

Attendance Policy

Students arriving after the start of class may receive a Tardy. Students arriving after 20 minutes (or not at all!) may receive an Absence. Student is responsible for all information missed due to not being present.

Late Work Policy

Late work is defined as work that is submitted more than 24 hrs late. Any work not submitted automatically is scored as a zero (0 pts.).

If work is submitted but it has been more than 24 hrs since it was due, the work will be graded with a 50% deduction of points in the gradebook, regardless of delay or reason.

Last day to submit late work will be the Friday BEFORE finals week. After this time, all zeroes (0 pts.) will remain and cannot be made-up or submitted for points.

Make-up Policies

Make-up exams may only be taken if the student received an excused absence for the missed test.

There are no make-ups for Labs. The lowest Lab grade will be exempted at the end of the semester

Additional Points

Email me one, school-appropriate, cute photo of a pet (if pet is not your pet, please acquire permission to photograph and submit before doing so). These photos will be presented to the class during the in-class final exam review.

Deadline: The Friday BEFORE finals week each semester. Worth: +1% towards the course exam category at the end of each semester.

Observation Notebook

Throughout the semester, students will be given star charts to be used for their Observation Notebook. This will be a combination of tables and star charts. This observation notebook will be used for various purposes throughout the semester.

This will count as a project grade.

A 3-ring binder is required.

Resources Available to You

The Writing Center

All writers improve with practice and feedback, so as a student in this course, you are encouraged to use the Writing Center (in Robert Bell 295, Bracken Library, or online) to get additional feedback on your writing. To schedule a free appointment to discuss your writing, go to www.bsu.edu/writingcenter.

Online and in-person appointments are available seven days a week; however, plan ahead because appointments book quickly!

The Learning Center

The Learning Center offers free Tutoring and Academic Coaching for many courses at Ball State. Students can make appointments for online (Zoom) or in-person (NQ 350) appointments. Unvaccinated students are required to wear masks and practice physical distancing in the Learning Center.

To make an appointment, visit my.bsu.edu and click on “TutorTrac” in the Additional Tools section, or just go directly to <https://ballstate.go-redrock.com>.

Testing accommodations for students with disabilities are available for students who have received the appropriate documentation from Disability Services. Tests may be administered in the Learning Center.

Supplemental Instruction is available in select courses. If you have an SI leader for your course, that person will provide students with information the first week of school regarding weekly study sessions.

For more information about all of our programming, visit <https://bsu.edu/learningcenter> or call (765) 285-1006.

Important Information You May Need to Know

Dual Credit-High School Credit Policy Statement

Students may choose to enroll in Ball State’s Dual Credit Program to earn college credit for ASTR 120, the Sun and Stars, from Ball State at a reduced rate of tuition (\$250 flat rate). Students who are eligible for free or reduced lunch this academic year may enroll at no charge if verified by the school.

To enroll in Ball State’s Dual Credit Program, students should have a 3.0 GPA on a 4.0 scale and complete the application & registration process before the given deadline. Ball State will bill students via postal mail; no money should be submitted to the high school. College credit can only be earned during the semester (or, in the case of year-long classes, during the academic year) in which the student is enrolled. Late enrollments are not permitted.

Whether college credit earned through dual credit courses will be accepted by another institution of higher education is determined by the college or university to which a student is seeking admission. Before enrolling through Ball State’s Dual Credit Program, students should check directly with that institution to determine if a course will be accepted and how it will be counted toward graduation requirements. Refunds will not be issued if Ball State credits are not able to be transferred. In most cases, students will need to earn a C or better to transfer credit from Ball State to another institution. Grades of D or lower earned in Ball State Dual Credit courses are recorded on a student’s Ball State transcript but may not be able to transfer.

The rigor of this course will be periodically reviewed by Ball State University faculty in an effort to maintain the high quality of education that each student receives. To learn more about Ball State’s Dual Credit Program, visit bsu.edu/dualcredit, call 765-285-1581 or email dualcredit@bsu.edu.

Indiana Academy Diversity Statement

The Indiana Academy for Science, Mathematics, and Humanities is committed to being an inclusive educational community that values diversity in policy and practice. We aim to foster an educational environment where students, faculty, and staff exchange ideas freely, engage in critical thinking, and reexamine their personal perspectives. To create an environment where this respectful and productive dialogue is possible, we do not allow discrimination on the basis of race, ethnicity, sex, geographic origin, gender, gender identity, sexual orientation, disability, religion, age, or nationality. The affirmation, appreciation, and inclusion of multiple cultures ensures that all students, faculty, staff, and the wider Indiana Academy community will be able to thrive in our multicultural academic and residential environment.

Ball State University aspires to be a university that attracts and retains a diverse faculty, staff, and student body. We are committed to ensuring that all members of the community are welcome, through valuing the various experiences and worldviews represented at Ball State and among those we serve. We promote a culture of respect and civil discourse as expressed in our Beneficence Pledge and through university resources found at <http://cms.bsu.edu/campuslife/multiculturalcenter>.

BSU Student Rights and Responsibilities

While enrolled in Ball State's Dual Credit Program, you are expected to abide by the academic rules of behavior befitting a university student. You should read the Dual Credit Student and Parent Handbook, located at <https://bsu.edu/dualcredit>

In particular, review the Code of Student Rights and Responsibilities, focusing on the policies regarding student rights and responsibilities, behavior, academic integrity, and related procedures.

The Dual Credit Student and Parent Handbook includes information regarding student qualifications, prerequisites, available courses, responsibilities, financial aid stipulations, transferability, withdrawal, refund and billing policies and more. It is important that you review the information contained in it.

Policy on the Americans with Disabilities Act (ADA)

If you need course adaptations or accommodations because of a disability, please contact the Office of Disability Services. The Office of Disability Services coordinates services for students with disabilities; documentation of a disability needs to be on file in that office before any accommodations can be provided. Disability services can be contacted at 765-285-5293 or dsd@bsu.edu.

Title IX – Sexual Misconduct

Ball State University is committed to establishing and maintaining an effective, safe, and nondiscriminatory educational environment in which all individuals are treated with respect and dignity. For information about Ball State University's Interim Title IX Policy and Procedures, please visit our website. Please note that the University's policy and procedures have undergone significant revisions starting with the 2020-21 school year and ongoing.

Consistent with the University's Notice of Nondiscrimination and in accordance with the U.S. Department of Education's implementing regulations for Title IX of the Education Amendments of 1972 ("Title IX"), Ball State University prohibits sexual harassment that occurs within its education programs and activities.

This prohibition extends to all applicants for admission or employment and to all students (any status) and all employees (any status). An individual who is found to have committed sexual harassment in violation of this policy is subject to the full range of University discipline, up to and including termination of employment or expulsion. The University will provide persons who have experienced sexual harassment with ongoing remedies as reasonably necessary to restore or preserve access to the University's education program and activities.

Inquiries concerning the specific application of Title IX at Ball State should be directed to Ms. Katie Slabaugh, Associate Dean of Students/Title IX Coordinator in the Frank A. Bracken Administration Building, room 238, 765-285-1545, kslabaugh@bsu.edu. Persons can also contact the U.S. Department of Education Office for Civil Rights, Washington, D.C. 20202-1328, 1-800-421-3481, ocr@ed.gov.

Student Academic Ethics Policy

Actions which include but are not limited to cheating, plagiarism, falsely claiming to have completed work, cooperating with another person in academic dishonesty, knowingly destroying or altering another student's work, or attempting to commit an act of academic dishonesty that violates the Student Academic Ethics Policy (<http://www.bsu.edu/associateprovost/academicethics>).

The consequences of academic dishonesty are determined on a case-by-case basis by each instructor and may include but are not limited to one or more of the following academic sanctions: informal meeting, removal from dual credit course, dismissal from the university, or other appropriate consequence.

Syllabus Change Policy

This syllabus is a guide to the course and may be subject to change with reasonable advanced notice as course needs arise.