



The College at
BROCKPORT
 STATE UNIVERSITY OF NEW YORK

Office of the Chief Diversity Officer

TO: Dr. Stanley Radford
 Physics

FROM: Kandie Gay
 Office of the Vice Provost - Academic Affairs

Date: August 7, 2018

RE: General Education Codes

The courses your department submitted to the General Education Committee have been reviewed and the Committee's action follows:

COURSES	CODES APPROVED	CODES NOT APPROVED
AST 215: Exploring the Solar System w/Lab AST 220: Stars, Galaxies and the Universe w/Lab	Add: Natural Science w/Lab (L)	

If you wish further clarification of the Committee's decisions, you may contact

James Zollweg, Chair of the General Education Committee
Department of Earth Science
Email: jjzollweg@brockport.edu

Copy: Jose Maliekal, Dean
 Arts & Sciences

Monica Brasted, Associate Dean
 Arts and Sciences

James Zollweg, Chair
 General Education Committee

Tameciah Browne
 College Senate

Peter Dowe
 Registration and Records

Janice Stewart
 Registration and Records



350 New Campus Drive
Brockport, New York 14420
585-395-2586 * 585-395-2006 (fax)
senate@brockport.edu
brockport.edu/collegesenate

Resolution 2017-18 #34 College Senate

Supersedes Res #: _____

TO: Dr. Heidi Macpherson, College President

FROM: The College Senate:

- RE: → I. Formal Resolution (*Act of Determination*)
 II. Recommendation (*Urging the Fitness of*)
 III. Other, For Your Information (*Notice, Request, Report, etc.*)



SUBJ: AST220 Stars, Galaxies and the Universe with Laboratory (for N designation) (#49_17-18committee)

Implementation Effective Date**: 8 / 20 / 18

Signed: [Signature] Date: 8 / 3 / 18
(Sandeep Singh, 2017-18 College Senate President)

Signed: [Signature] Date: 4 / 3 / 18
(Dr. Eileen Daniel, Vice Provost, The College at Brockport)

****Implementation of resolution requires final approval from SUNY- State Education Department.**
 YES NO

Please fill out the bottom portion and follow the distribution instructions at the end of this page.

TO: Dr. Sandeep Singh, College Senate President

FROM: Dr. Heidi Macpherson, College President

- RE: → I. Decision and Action Taken on Formal Resolution (circle choice)
 a. Accepted
 b. Deferred for discussion with the Faculty Senate on ___/___/___
 c. Unacceptable for the reasons contained in the attached explanation.
 d. Comments:

Signed: [Signature] Date: 6/15/18
(Dr. Heidi Macpherson, President, The College at Brockport)

DISTRIBUTION:

The College Senate will forward the resolution signed by the College Senate President to the Vice Provost for determination as to whether the implementation of the resolution requires final approval from SUNY-State Education Dept. The Vice Provost will then forward the resolution with that designation to the College President. Upon approval, the College President will forward copies of resolutions to his/her staff who will, in turn, forward copies to their staff and to the College Senate. The College Senate Office will post resolutions to the College Senate Web at <http://www.brockport.edu/collegesenate/resolutions>.

Need to go to SUNY

**COLLEGE SENATE OFFICE
RESOLUTION PROPOSAL COVER PAGE
DEADLINE FOR SUBMISSIONS:
JANUARY 31**

Incomplete proposals will be returned and proposals received after the deadline may not be reviewed until next semester.

Routing Number <i>Routing # assigned by Senate Office</i> 2017-2018	49_17-18UCGE <i>Use routing number and title in all reference to this proposal.</i>
This Proposal Replaces Resolution	

INSTRUCTIONS

- Use committee guidelines available at brockport.edu/collegesenate/proposal.html.
- Prepare ONE complete document in **Word format or PDF**: include this proposal cover page, the detailed proposal, and any relevant supporting data or documentation, including letters of support from your department chair and dean, if applicable, as well as letters of support or dissent (or evidence that such letters were sought) from all affected programs, departments, or units at the College.
- **Locate the Resolution # and date this proposal will replace at our "Approved Resolutions" page on our Web site.**
- Email completed proposal to senate@brockport.edu. (General Education Proposals and questions go to kgay@brockport.edu in the Vice Provost's Office first.)
- Make revisions on the paperwork emailed to you from the Senate office that shows the assigned routing number on top. Submit updated document to senate@brockport.edu.
- Questions? Call the Senate office at 395-2586 or the appropriate committee chairperson.

1. **PROPOSAL TITLE:** Please be somewhat descriptive, i.e. *Use a course number and/or title, indicate if for GED code, etc.*

AST 220: Stars, Galaxies, and the Universe w/Laboratory (for "L" designation)

2. **BRIEF DESCRIPTION OF PROPOSAL:**

Create a new Astronomy course with GenEd Natural Science code "L"

3. **WILL ADDITIONAL RESOURCES AFFECTING BUDGET BE NEEDED?** NO YES **EXPLAIN YES**

4. **DESCRIBE ANY DATA RELATED TO STUDENT LEARNING OUTCOMES ASSESSMENT USED AS PART OF THE RATIONALE FOR THE REQUESTED SENATE ACTION.**

5. **DESCRIBE THE IMPACT, IF ANY, THAT THESE CHANGES WILL HAVE ON STUDENT ELIGIBILITY FOR THE EXCELSIOR SCHOLARSHIP.**

6. **DESCRIBE THE IMPACT, IF ANY, THAT THESE CHANGES WILL HAVE ON TRANSFER STUDENTS AND THEIR ABILITY TO TRANSFER SEAMLESSLY AS MANDATED BY SUNY POLICY.**

No effect

7. **ANTICIPATED EFFECTIVE DATE:**

Spring 2019

8. **SUBMISSION & REVISION DATES:** PLEASE DATE ALL REVISED DOCUMENTS TO AVOID CONFUSION.

	First Submission	U ₁ dated on	U ₁ dated on	U ₁ updated on
2/27/2018				

9. **SUBMITTED BY: (contact person)**

Name	Department	Phone	Email
Eric Monier	Physics	5589	emonier@brockport.edu

10. **COMMITTEES: (Senate office use only)**

Standing Committee	Forwarded To	Dates Forwarded
<input type="checkbox"/> Executive Committee	Standing Committee	2/27/2018
<input type="checkbox"/> Enrollment Planning & Policies	Executive Committee	
<input type="checkbox"/> Faculty & Professional Staff Policies	Senate	
<input checked="" type="checkbox"/> General Education & Curriculum Policies	Passed GED's go to Vice Provost	
<input type="checkbox"/> Graduate Curriculum & Policies	College President	
<input type="checkbox"/> Student Policies	OTHER	
<input checked="" type="checkbox"/> Undergraduate Curriculum & Policies	REJECTED -WITHDRAWN	

NOTES:

**The College at Brockport
Course Registration Form**

1. Discipline Course No. (To be assigned by Registrar for new courses)
 Official Title

Abbreviated course title (limit to 18 Characters)

- New Course
- Current Content Revised
- Title Change (Previous Title)
- Number Change (Previous Number)
- Inactivation of course (course will not be offered in the near future) Effective Term
- Topics Course (If checked, complete item 2)
- Other (describe)

2. Topics Course Only
 a. Generic Course Number: Discipline Course No.
 b. Generic Course Title:
 c. Topics course Title
 d. Topics course offered : Semester Year

3. Semester Hours of credit assigned to course (Invariable):
 Variable Credit Range to credit hours
 Is this course repeatable for credit?

4. Grading (Check any that apply)
 a. Letter Grade Pass/Fail (S/U Only) Approved for a PR (In-Progress) grade
 b. Course requires a minimum grade of for General Education/major/minor/certification.

5. Is this a Liberal Arts Course?
 6. General Education Information: (Complete only for General Education courses) *See last item.
 a. General Education Knowledge Area (choose one if applicable):

- b. Additional student learning outcomes: (check all that are currently approved)
- Contemporary Issues (I) Scholarship on Women (W)
 - Diversity (D) Other World Civilization (Non-Western) (O)

7. Cross listed Course: Discipline Course No.
 8. Prerequisites: Discipline Course No.
 9. Corequisites: Discipline Course No.

Submitted by: Eric M. Monier Date: 2/23/2018
 Chairperson's Approval: Stanley P. Reedford Date: Feb 23 2018
 Dean's Approval: M. Bruster Date: 2-27-18
 Vice Provost's Approval: _____ Date: _____

(Only required for General Education Courses)

10. Swing Course Number: Only for courses offered in the same discipline at both the undergraduate and graduate levels, please give number (i.e. 428/528)

Note: If this is a Swing course, list additional requirements required for the graduate level.

11. Frequency (Check only one)

Every Semester

Every Fall

Every Spring

Every Summer

Every Other Year

Irregularly

By Special Arrangement

12. Relationship to Degrees/Programs: Required

Elective

13. For all courses please attach the following

a. Objectives

b. Outline of course

c. Methods of Assessing Student Performance

d. Material Required (Films, Readings, etc...)

e. Additional work required of graduate level students if course is a "swing course"

14. If this course requires any additional scheduling arrangements with regard to time or room/space, please explain below:

Lecture 5:00-6:15 pm Tues/Thurs in Lennon 140
Lab will use the College planetarium (Lennon 134) and Smith 104

15. Write a brief course description for the College Catalog. Reflect content as accurately as possible using 65 words or less (about 500 characters). Use Action verbs and omit "This course covers..." or similar phrases.

Follows stellar and galactic astronomy through the last hundred years of discovery, leading to the modern scientific understanding of our place in the cosmos. Traces the lives of stars, the formation and evolution of galaxies, and the birth and fate of the universe. Emphasizes the modern frontiers of astrophysics, including black holes, dark matter, gravitational waves, and dark energy. Lab section will use the College planetarium to illustrate some concepts, and provides for observation with telescopes. Not open to students with credit for AST 203 or 205.

*For General Education courses only, attach:

Supplemental General Education Course Registration Form/Student Learning Outcomes Checklist (for specific codes requested).

**GENERAL EDUCATION PROGRAM
SUPPLEMENTAL COURSE REGISTRATION FORM**

REVISED EFFECTIVE FALL 2016

COURSE NUMBER: AST 220 COURSE TITLE: Stars, Galaxies, and the Universe w/Lab
COURSE NUMBERS FOR ANY CROSSLISTINGS: _____
SUBMITTED BY: Eric Monier DEPARTMENT/PROGRAM: Physics
DATE: 2/23/2018 ESTIMATED SEATS/SEMESTER? 18
NEW COURSE? YES NO HYBRID OR ONLINE? YES NO
RE-REGISTRATION OF EXISTING COURSE? YES NO
UPPER-DIVISION KNOWLEDGE AREA EXCEPTION FOR TRANSFERS YES NO

DEPARTMENT CHAIR'S APPROVAL Spencer P. Radford DATE: 2/27/2018
Required before General Education Committee Action
SCHOOL DEAN'S ACKNOWLEDGEMENT M. Brewster DATE: 2/27/18
Required before General Education Committee Action. Signature from this office indicates that the proposal is complete and ready to be reviewed by the College Senate General Education Committee.

GENERAL EDUCATION COMMITTEE APPROVAL _____ DATE: / /
Required after General Education Committee Approval
ACADEMIC AFFAIRS ACKNOWLEDGEMENT _____ DATE: / /
Required after General Education Committee Approval

▪ All items listed below must be received in order for the committee to act on the proposed course. All materials submitted must be typed or printed. Submissions that are incomplete or incorrect will be returned without being evaluated by the committee.

- A copy of the standard College *Course Registration Form* signed by the chair and dean.
- The Student Learning Outcomes Checklist(s) as appropriate for requested code(s).
- A course syllabus that includes a list of the student learning outcomes for the course and provides a topical outline. [This is required by SUNY General Education.]
- A list of textbooks to be used and a current course bibliography, all with full bibliographic citations.

▪ Check below the General Education code(s) being requested and attach a completed Student Learning Outcomes Checklist(s) for each:

- | | |
|---|---|
| <input type="checkbox"/> Fine Arts ("F") | <input type="checkbox"/> Contemporary Issues ("I") |
| <input type="checkbox"/> Fine Arts Performance ("P") | <input type="checkbox"/> Perspectives on Gender ("W") |
| <input type="checkbox"/> Humanities ("H") | <input type="checkbox"/> World Civilization (Non-Western) ("O") |
| <input type="checkbox"/> Natural Sciences ("N") | <input type="checkbox"/> Diversity ("D") |
| <input checked="" type="checkbox"/> Natural Sciences Laboratory ("L") | <input type="checkbox"/> Oral Communication ("Y") |
| <input type="checkbox"/> Social Sciences ("S") | |

Committee Action:

- Approved as requested. Course will be filed with Registrar's Office.
- Not approved. If not approved for inclusion in General Education Program at this time, please see comments below:

NATURAL SCIENCES AND NATURAL SCIENCES WITH LABORATORY – CODED “N” OR “L” KNOWLEDGE AREA STUDENT LEARNING OUTCOMES CHECKLIST, MARCH 2012 VERSION

Please check all student learning outcomes that apply to this course. In the space provided below that/those checked outcome(s), describe how course instruction will be designed to achieve these outcomes. Also, state briefly how you will assess that particular student learning outcome in your course. Natural Sciences courses may carry the “W,” “WY,” “O” and/or “D” codes (Complete checklist for these codes and attach.)

The following are general requirements for all Knowledge Area courses—

- Knowledge Area courses for native Brockport students are lower division courses.
- Knowledge Area courses may not require prerequisites.
- Knowledge Area courses that transfer students may use to complete the SUNY General Education requirements may receive exception as an upper-division course.

All Knowledge Area courses must satisfy the following student learning outcomes:

- Students will write a short paper or report reflecting the writing conventions of the disciplinary area, with at least one opportunity for feedback and revision or multiple opportunities for feedback. *Note: A short paper is defined as 2000 words or an equivalent amount in several shorter assignments (FS Res. n their own and others' work.*

One paper with revision will be assigned. Please see the course syllabus for a more detailed description.

Natural Sciences Non-lab and Laboratory Courses must satisfy all of the following student learning outcomes:

- Students will demonstrate understanding of the methods scientists use to explore natural phenomena, including observation, hypothesis development, measurement and data collection, experimentation, evaluation of evidence, and employment of mathematical analysis.

This is a course in astrophysical processes in the universe. It will cover the hypotheses and observations that lead to modern theories governing stellar structure and evolution; galaxy formation; and the origin, evolution, and fate of the universe. Since questions remain in these generally accepted theories, while theories don't yet exist for fields just getting underway (e.g. the nature of dark matter and dark energy), and still other fields have been advanced by accidental discoveries (e.g. pulsars and the cosmic microwave background radiation), the course presents a complete picture of how scientists work. Modern data collection, experiment, and analysis will be presented as we describe what is known about the content of the universe, the observations leading to those conclusions, and the questions that remain to be answered.

Assessment will be achieved through evaluation of performance on in-class activities (ranking tasks, predicting the outcome of an experiment, etc.) and exam questions

- Students will explore nature and natural phenomena in the context of a science discipline dealing with at least one of the following; matter, motion, and energy; the behavior of materials and interaction between substances; the formulation, evolution, and behavior of celestial objects; the formation and evolution of

Earth's environment; biophysical and biochemical principles of life; the relationship of living things to each other and their environment.

The course will cover this outcome in many ways, including but not limited to: Newton's laws of motion and gravity; the interaction of light and matter; the formation and evolution of stars; stellar nucleosynthesis; Hubble's Law and the expansion of the universe; and the Big Bang origin of the universe itself.

- Students will show competence in at least two of the mathematical skills identified in MTH 112.

Students will use a variety of algebraic, statistical, and graphing skills to gain an understanding of the mathematical basis of astronomy. Of particular importance will be topics including the strength of gravity as a function of distance; the inverse square law for light, rotation curves of spiral galaxies; light curves of variable stars; interpretation of stellar spectra; the measurement of radial velocities through an analysis of cosmological redshifts; and the concept that looking further away means looking back in time.

Assessment will be achieved through evaluation of performance on exam questions requiring calculations, familiarity with graphs, and the ability to draw conclusions based on data.

- Students will demonstrate application of scientific data, concepts, and models in one of the natural sciences.

The course will span the history of our understanding of stars, galaxies, and the universe. Students will be presented with observations (data), models that were developed to explain those observations, and the experiments performed to test predictions made by those models. They will step through the scientific process followed by astronomers, and they will be challenged to interpret observations acquired by modern telescopes and spacecraft.

Assessment will be achieved through evaluation of performance on in-class activities (ranking tasks, assessing the implications of a data set, etc.) and quantitative and conceptual exam questions

Natural Sciences Laboratory Courses (L) must also include the following student learning outcome

- Students will acquire and analyze scientific data through laboratory experiences in one of the natural sciences.

The laboratory component of the course will use a variety of hands-on experiments and computer-based activities. Students will gather their own data with computer simulations, or download publicly available astronomical data, to analyze in order to develop these skills.

Assessment will be achieved through evaluation of performance on sub-sections of several labs.

AST 218/220 – Stars, Galaxies, and the Universe

Lecture, Spring 20xx

Tuesday & Thursday 5:00 - 6:15 pm Lennon 140

Instructor: Prof. Eric Monier

Office: 118 Smith Hall

Office Hours: Wednesday 2:30 – 3:20pm; Tuesday Thursday 3:00 – 4:00pm; or by appointment

Phone: 395-5589

email: emonier@brockport.edu

Description: The night sky continues to inspire questions about the Universe and our place in it. This course is a survey of what astronomers have learned about stars, galaxies, and the Universe as a whole in the last 100 years or so. Our current understanding of the births and deaths of stars, the evolution of galaxies, and the origins of the Universe itself represents the pinnacle of human scientific progress, achieved by applying fundamental physical laws to light that has traveled across vast gulfs of space and time. Important questions remain, however, and new questions continue to arise.

After some introductory material on light and motion to get us started, we will cover:

- I. **Stars:** How they form, evolve, and die. From our own Sun to neutron stars and black holes, the understanding of how stars work is the triumph of 20th century astrophysics.
- II. **Galaxies:** The search for the first galaxies is one the frontiers of 21st century astrophysics, and a primary goal of the James Webb Space Telescope launching this spring.
- III. **The Universe:** It all started with a Big Bang nearly fourteen billion years ago. What was the Universe like in those early moments, what factors led to the Universe we see today, and how will it evolve in the future?

Throughout the course we will see how ideas have arisen and how they've been tested by observations. The emphasis will be on what we know and how we know it, as well as *what we don't yet know*.

Purpose: As a General Education course satisfying the Natural Science (or Natural Science w/Lab) requirement, the goals of the course are for students to understand the principles, theories, and methods of modern science; the process and implications of scientific discoveries; and the potential of science and technology to address problems of the contemporary world.

Student Learning Outcomes: Students successfully completing this course should be able to:

- Demonstrate understanding of the methods astronomers use to explore natural phenomena, including observation, hypothesis development, measurement and data collection, experimentation, evaluation of evidence, and employment of mathematical analysis.
- Explore nature and natural phenomena through the study of matter, motion, and energy; and the formation, evolution, and behavior of celestial objects.
- Demonstrate application of scientific data, concepts, and models in astronomy.
- Show competence in at least two of the mathematical skills identified in MTH 112.

Required Materials:

1. Textbook: This course will use the free *OpenStax Astronomy* textbook by the primary authors A. Fraknoi, D. Morrison, and S. Wolff (<https://openstax.org/details/books/astronomy>)
2. *iClicker*

Lectures: In the lectures I will use notes, demonstrations, animations, and the in-class activities to explain and discuss the material assigned in the readings. This is an excellent time to ask questions; your participation will make the lectures more effective for everyone. Be sure to complete the assigned readings and come to lecture prepared to discuss them.

Blackboard: Course information and resources will be posted on Blackboard, including this syllabus, worksheets, reading schedule, reading quizzes, study guides, practice exams, animations, etc. I will also post PowerPoint slides after lecture. Use these to review your understanding and to fill in any gaps.

Attendance/Participation: We will be using the iClicker system to keep the lectures interactive. You will bring your clicker to each class and respond to questions during the lecture. A correct response will be worth 10 points, an incorrect response will be worth 5 points and a non-response will receive no credit. If you are present but have forgotten your clicker I'll assign you 50% of the possible points. Your participation grade will be largely based on your total points at the end of the semester.

Your attendance is required at all lectures. You should notify me of any excused absences before lecture if possible, or immediately afterward in the event of an emergency. If you are not feeling well, please be considerate of your fellow students and stay home. For all absences, students are responsible for the announcements and material presented in the lectures or on Blackboard. This course covers a lot of ground, so don't fall behind!

Electronics Policy: Studies show that laptops are a distraction to other students. Therefore, laptops will only be permitted in the back two rows of the lecture hall, and only one window on the laptop may be open. Students violating this policy will receive no participation credit for that day. Similarly, studies show that students who use their cell phones in class will receive lower overall grades. Please leave your phone in your bag and focus on the task at hand.

Homework: There will be several assignments (e.g. completing a survey, writing 1-2 page paper) that will count toward the participation portion of your grade. I will also post worksheets that you can complete to get some practice with the concepts covered in lecture, but these will not be collected or graded. The worksheets will primarily be in the form of ranking tasks, and I will post solutions so that you can evaluate your understanding.

Exams: Three exams will take place in class on **February 21, April 2, and April 30**. The exams will consist of multiple choice, true-false, and possibly some short answer questions. Make-up exams will only be given in the event of excused absences. You must call or email me by **10 am** the morning after an exam to explain your absence and schedule a make-up exam. Note that make-up exams, depending on when they are taken, may consist entirely of essay questions.

I will drop the lowest of your three regular exam grades. If you know in advance that you are going to miss an exam, please contact me at least one week before the scheduled exam date and you may be able to take it early.

Term Paper: General Education courses at Brockport require a writing component. You will write a 'short paper' (2000 words, or about 7-8 double-spaced pages) on some topic in astronomy. This assignment is an opportunity for you to learn about something related to astronomy in depth. You may write about anything that interests you, though you may find more sources are available on current issues in astronomy (within the last 3-5 years). In choosing a topic and writing your paper, keep in mind that your emphasis should be on the scientific process and the science involved. Your paper must include at least **three** sources from books or periodicals (print or online) such as *Scientific American*,

Astronomy, Sky and Telescope, Science, New Scientist, Mercury, Nature, etc. The Drake Library gives you access to all of these through Academic Search Complete; the library itself has an extensive collection of astronomy books. Please note that non-periodical internet sources may not be used as primary sources, though you can use the internet to choose a topic and find suitable sources.

Choose a topic specific enough that you can learn something about it in a few weeks. Your textbook and *teachastronomy.com* are good starting places for ideas. **I will post possible topics and additional paper details on Blackboard.**

The paper should be six to eight (numbered) double-spaced pages of text (2000 words), plus an abstract and bibliography (which do not count toward your word total). The important dates are

- February 23:** Select a topic and hand in an outline of your term paper.
- March 22:** Hand in your term paper.
- April 12:** Get back your submission with comments for revision.
- April 26:** Hand in final, version.

You will submit the outline as a hard copy in class. You will submit the initial and revised papers to a drop box on Blackboard. Late submissions will be penalized, and very late submissions may not be accepted.

Final Exam: The final exam will be comprehensive. **The final is scheduled for 5:20 – 7:20 pm on Tuesday, May 14th in Lennon 140** (the usual lecture room).

Reading Quizzes: To encourage you to do the readings before lectures, you can receive bonus points by completing the 'Reading Quiz' for that day on Angel. Quizzes will typically be posted over the weekend for material to be covered the following week. These quizzes are **optional** but can net you Bonus Points.

Bonus Points: As mentioned above, opportunities will arise throughout the semester to supplement your grade with bonus points obtained through the optional Reading Quizzes. Bonus points can provide a modest boost to your grade (B- to a B, for example). They will not turn a C into an A.

About math: Galileo's observation that "math is the language of science" is as true today as it was in the 17th century. We use math to state precisely the "laws" of nature. Specific math skills used in this course are:

- arithmetic skills, including scientific notation and an understanding of fractions and decimals;
- graph skills including interpreting linear graphs; and
- algebra skills, including understanding proportions and simple manipulation of equations.

These skills are essential for successful completion of the course. The exams will not require calculators, but may include questions related to the interpretation of graphs, as well as the use of proportions and simple calculations involving powers and roots.

Grading policy: Your grade in this class will be based on your performance in the following areas:

	AST 218	AST 220
Participation	10%	7.5%
Exam	20%	15%
Exam	20%	15%
Term Paper	20%	15%
Comprehensive Final Exam	30%	22.5%
Laboratory	N/A	25%

Grading Scale: Your final grade in the lecture will be based on your average as calculated from the factors above. The minimum average required for a given letter grade will be as follows:

Average	92	87.5	82	77.5	73	68.5	64	59.5	55	50.5	45
Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-

Academic Integrity:

Please be aware of *The College at Brockport Policy on Student Academic Dishonesty*:

"Academic dishonesty, "cheating," and other forms of misrepresenting others' work as your own, such as plagiarism, are considered serious breaches of academic integrity and are major violations of the standards of ethical behavior that the College expects from all its students."

Academic dishonesty will result in a zero for an exam, and may result in dismissal from the course.

Disability statement: *"Students with documented disabilities may be entitled to specific accommodations. SUNY Brockport's Office for Students with Disabilities makes this determination. Please contact the Office for Students with Disabilities at 395-5409 or osdoffic@brockport.edu to inquire about obtaining an official letter to the course instructor detailing any approved accommodations. The student is responsible for providing the course instructor with an official letter. Faculty work as a team with the Office of Students with Disabilities to meet the needs of students with disabilities."*

Title IX Compliance statement: *"Gender discrimination and sexual harassment are prohibited in class. Title IX legislation requires the College to provide gender equity in all areas of campus life. If you or someone you know has experienced gender discrimination, sexual harassment, or sexual assault, we encourage you to seek assistance and to report the incident through resources available at www.brockport.edu/titleix/index.html. Confidential assistance is available at Hazen Center for Integrated Care. For these and other regulations governing campus life, please see all of our Student Polices at www.brockport.edu/policies/index.php."*

Emergency Preparedness Statement: *"In case of emergency, the Emergency Alert System at The College at Brockport will be activated. Students are encouraged to maintain updated contact information using the link on the College's Emergency Information website, <https://www.brockport.edu/support/emergency>. Included on the website is detailed information about the College's emergency operations plan, classroom emergency preparedness, evacuation procedures, emergency numbers, and safety videos. In addition, students are encouraged to familiarize themselves with the Emergency Procedures posted in classrooms, halls, and buildings and all college facilities."*

Tentative Course Outline and Exam Schedule – AST 218/220 Spring 20xx
(see the online schedule for readings and any revisions)

Unit 1: Tools of Astronomy

January 29:	Introduction
January 31:	Scale of the Universe
February 5:	Laws of Motion and Gravity
February 7:	The Electromagnetic Spectrum
February 12:	Radiation and Spectra
February 14:	The Sun: An Average Star
February 19:	** EXAM 1 (Unit 1) **

Unit 2: Stars

February 21:	Why Does the Sun Shine?
February 26:	Properties of Stars
February 28:	A Stellar Census
March 5:	Star Formation
March 7:	The Lives of Stars
March 12:	The Deaths of Stars
March 14:	Stellar Corpses
March 19, 21:	NO CLASS – SPRING BREAK
March 26:	Black Holes and Curved Spacetime
March 28:	** EXAM #2 (Unit 2)**

Unit 3: Galaxies

April 2:	Structure of the Milky Way
April 4:	Properties of the Milky Way
April 9:	A Universe of Galaxies
April 11:	The Expanding Universe
April 16:	Active Galaxies
April 18:	Clusters of Galaxies
April 23:	Galaxy Formation and Distribution
April 25:	** EXAM 3 (Unit 3) **

Unit 4: Cosmology

April 30:	The Big Bang
May 2:	The Fate of the Universe
May 7:	The First Three Minutes
May 9:	Life in the Universe
May 14:	** FINAL EXAM (Units 1-4) 5:20-7:20pm, 140 Lennon**

**AST 220 Stars, Galaxies, and the Universe Laboratory – Spring 20xx
(Mondays 6:30 – 9:30 pm)**

INSTRUCTOR:

OFFICE:

EMAIL:

PHONE:

OVERVIEW: The exercises and experiments you do in this lab section will give you practice with some of the concepts we're covering in lecture. In addition, our planetarium time will give you some familiarity with the constellations of the spring and summer skies.

LABS: Labs will meet in the planetarium (Lennon 134). After reviewing the constellations or concepts of the celestial sphere we'll proceed to either a tabletop lab (in Smith 104) or a computer-based lab session. If the weather cooperates, we'll travel out to the campus observatory on Redman Rd. There you will use binoculars and telescopes and practice your knowledge of the constellations. *How will you know if lab is going to be outside?* Brockport's changeable weather can make this a last minute decision, so come prepared.

MATERIALS: To be prepared for each lab bring

- a scientific calculator,
- either a *low power* flashlight for the planetarium (I'll supply red tape to make it suitable for dark-adapted vision), or a red light app for your phone (the NightVision Light by Vixen Co. is free and available for iPhones. Others apps are available for Android).
- a planisphere, available from the bookstore
- a pen and pencil

GRADING: You should be able to finish the labs in the time available; therefore, labs are generally due at the end of class. Students leaving early without a legal excuse and without turning in their lab will receive no credit for the lab. Your lab grade will be assigned based on your performance on the labs and on two planetarium quizzes, as follows:

Labs	80%
Planetarium Quiz #1	10%
Planetarium Quiz #2	10%

The planetarium quizzes will test your familiarity with the nighttime sky and concepts on the celestial sphere, based on the time we spend in the planetarium. They will take place at the beginning of class on **March 5** and **April 23**. They will have 20 fill-in-the-blank questions on the stars, constellations, and celestial sphere concepts we have covered to that point. *Note: spelling counts on these quizzes.* There is no lab final.

Lab is worth 25% of your overall Astronomy 205 grade. As per campus policy, **students must pass the lab portion in order to pass the class.** Grades for the lab portion will follow a straight percentage: **A = 90-100%, B = 80-89%, C = 70-79%, D = 60-69%, E < 60%.**

ATTENDANCE & EFFORT: Attendance is required at all lab sessions. Exceptions will only be granted with a documented excuse per Brockport policy. Unexcused absences will result in a zero for that night. An excused absence can be made up in the last lab session (April 30).

Avoid external distractions and focus on the task at hand, particularly during the computer-based labs. Answer all questions with complete sentences. When working in pairs, work collaboratively and make a meaningful contribution.

MATH: You will use some algebra in the labs, but you should recognize the math you encounter (although it may be a while since you last used it). Please see me as soon as possible if you find you need help with the math.

ACADEMIC INTEGRITY: You will work some of these labs alone, while in others you will work with a partner. You may discuss the lab with others during an individual lab, but copying answers is obviously not permitted; individual lab write-ups must be your own work.

LEARNING OUTCOMES: Students completing this course should successfully be able to:

- Demonstrate understanding of the methods astronomers use to explore natural phenomena, including observation, hypothesis development, measurement and data collection, experimentation, evaluation of evidence, and employment of mathematical analysis.
- Explore nature and natural phenomena through the study of matter, motion, and energy; and the formation, evolution, and behavior of celestial objects.
- Demonstrate application of scientific data, concepts, and models in astronomy.
- Show competence in at least two of the mathematical skills identified in MTH 112.
- Demonstrate the application of scientific data, concepts, and models in astronomy.
- Acquire and analyze scientific data through laboratory experiences in astronomy.

Tentative Lab Schedule

Week 1:	Units & Conversions, Angles & Coordinates	Week 8:	Eclipsing Binary Stars
Week 2:	The Cosmic Calendar	Week 9:	Classifying Stars
Week 3:	Spectroscopy	Week 10:	Supernova Remnants
Week 4:	Properties of the Sun	Week 11:	Identifying Galaxies
Week 5:	Brightness and Surface Brightness	Week 12:	Hubble's Law
Week 6:	Stellar Parallax	Week 13:	Cosmic Distance Ladder
Week 7:	H-R Diagram	Week 14:	Make-up

DISABILITY STATEMENT, TITLE IX COMPLIANCE STATEMENT, and EMERGENCY

PREPAREDNESS STATEMENT: Please refer to the main course syllabus handed out in class and posted to Blackboard.