



Department of Astronomy

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24 November 2010

Larry Krissek, Chair
Committee on Curriculum and Instruction
College of Arts and Sciences
CAMPUS

Re: Proposal for GE Status for Astron 2291 and 2292

Dear colleagues,

The Department of Astronomy is requesting GE status for its beginning astronomy and astrophysics courses Astron 2291 (Basic Astrophysics and Planetary Astronomy) and Astron 2292 (Stellar, Galactic, and Extragalactic Astronomy and Astrophysics). These courses are primarily intended for astronomy majors, but they are suitable for anyone who is interested in learning astronomy at a mathematically challenging level. These courses are intended to fulfill the GE requirement in physical science.

Astronomy currently has two two-quarter GEC sequences that cover the breadth of Astronomy, Astron 161-162 and Astron 171-172. The latter is more rigorous (requiring Math 150) and is intended for BS students. We have not offered this course for some time due to low enrollments, and do not intend to propose them as semester-based courses. However, there is still some interest in a more challenging GEC sequence than Astron 161-162, so as we prepare our semester conversion plan, we would like to propose Astron 2291 and 2292 (currently known as Astron 291-292) as GE courses. The content of these courses is virtually identical to that of Astron 171-172, but Astron 2291-2292 are significantly more rigorous than Astron 171-172, requiring as prerequisites a year of calculus and a year of calculus-based physics.

We attach model semester-based syllabi for these proposed courses.

We note that students from Engineering and other areas of Arts and Sciences have taken Astron 291-292 as free electives and have done well.

Thank you for your consideration.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Bradley M. Peterson".

Bradley M. Peterson
Professor and Chair

Astronomy 2292: Stellar, Galactic, and Extragalactic Astronomy and Astrophysics GE Justification

We request GE status for Astron 2292. This course is intended to meet the GE requirement in physical science.

The general learning objectives for GE courses in the Natural Sciences are:

- (1) To understand the basic principles and central facts of the physical and biological sciences and their interrelationships.
- (2) To understand when, where, and how, the most important principles and facts were discovered, thus understanding the key events in the history of science both as events in human history and as case studies in the methods of science.
- (3) To understand the interaction between science and technology.
- (4) To understand the social and philosophical implications of major scientific discoveries.

Specific learning goals for Astron 2292 include the following:

- Understanding the nature of stars and planets that orbit other stars and the evolution of these systems with time (addresses objectives 1, 2, 3, and 4)
- Understanding galaxies as the basic building blocks of large-scale structure in the Universe (addresses objective 1)
- Understanding the modern view of cosmology and implications of dark matter and dark energy (addresses objectives 1, 2, 3, and 4)

BMP
24-Nov-2010

ASTRONOMY 2292 –STELLAR, GALACTIC, AND EXTRAGALACTIC ASTRONOMY AND ASTROPHYSICS

COURSE INFORMATION SPRING SEMESTER 2013

Lecturer: Professor Bradley M. Peterson
Office: 4055B McPherson Laboratory (MP 4055B), 292-2022
Office Hours: Afternoons before exams or by appointment
Email: peterston@astronomy.ohio-state.edu

TA:
Office:
Office Hours:
Email:

Classroom:
Class Hours:
Website: <http://www.astronomy.ohio-state.edu/~peterston/Ast2292/>

Textbook:

Required: *Foundations of Astrophysics* by Barbara Ryden and Bradley M. Peterson (Pearson Addison-Wesley Publishing). This is the same textbook used for Astron 2291.

Course Objectives and Philosophy:

This is the second course in a two-semester introductory sequence that is intended for sophomore astronomy majors (for whom this is a required course) as well other *scientifically literate* undergraduates who want to learn basic astronomy from a *quantitative* (calculus-based) perspective.

The specific major areas to be covered in this course are:

- Stellar astronomy and astrophysics
- Galactic astronomy
- Extragalactic astronomy and cosmology

Student Learning Goals and Objectives for Astron 2292:

- Understanding the nature of stars and planets that orbit other stars and the evolution of these systems with time
- Understanding galaxies as the basic building blocks of large-scale structure in the Universe
- Understanding the modern view of cosmology and implications of dark matter and dark energy

Course Prerequisites:

Astron 291 or Astron 2291.

Class Attendance Policy:

It is important to understand that the course is the lectures, and you are responsible for the material presented in class. Class attendance is simply expected, though the professor will not take roll.

Astronomy 2292 on the World-Wide Web:

The class webpage is at <http://www.astronomy.ohio-state.edu/~peterson/Ast2292/>. This page will have all current course information, including copies of the syllabus and course information (the material distributed on the first day of class). Any announcements made in class will also be posted here. You can also use this to send e-mail questions to the professor or the T.A.

Problem Sets:

Problems sets will be assigned periodically, and will be due on the dates given on the syllabus. Since this is a problem-solving course, the problem sets are an integral part of the course and play an important role in solidifying your understanding of the material. The problem sets will be graded and will account for 20% of the course grade. Problem sets will be assigned at least one week before they are due. In general, late work will not be accepted for credit, except with prior approval of the professor, and late submissions will be corrected at the T.A.'s leisure. *Please staple all the pages of your homework together.*

Recitation Sessions:

Recitation sessions (interactive problem-solving sessions run by one of the T.A.) are scheduled on days before problem sets are due and on days before examinations. Check the schedule carefully. Come prepared with questions.

Examinations:

There will be three **midterm examinations**, tentatively scheduled for (1) Wednesday, 13 February, (2) Friday, 8 March, and (3) Friday, 19 April. Each of the midterm examinations will account for 20% of the course grade.

A comprehensive final examination will be given at TBD, in the regular classroom. The final examination will account for the remaining 20% of the course grade. The final examination will be *open book*; students are allowed to bring in textbooks and notes for the final examination. No notes or books are allowed for the midterm exams, however.

Make-up Examinations:

Make-up examinations will be allowed under extraordinary circumstances only (as determined by the professor), e.g., illness (as verified by a physician), or personal tragedy. Make-up midterms usually will be one-hour oral examinations.

If an examination conflicts with an approved University function (e.g., if you are a member of a varsity athletic team or *TBDBITL* and are required to leave town), you may take an exam earlier than the scheduled date, provided that you obtain permission from the professor at least a week in advance.

If you should miss the final examination, your course grade will be recorded as a failure unless you contact Dr. Peterson (by phone, if necessary) before noon on TBD and arrange to take the final at the beginning of (DEADLINE OF NEXT TERM) – in this case you will receive a grade of incomplete.

Grades:

Grades will be determined as described above, with equal weight given to the homework, each of the three midterms, and the final exam. Final letter grades will be available on the registrar's website at <http://www.ureg.ohio-state.edu> as soon as they are determined. Absolutely no grades will be given out over the telephone (University policy).

Grading Scale:

While some renormalization of the scale is required each year, the following grading scale will hold approximately:

- A: >80%
- B: 70 – 80%
- C: 60-70%
- D 50 – 60%
- E <50%

Course Syllabus:

A course syllabus will be distributed on the first day of class, and is also available on the class webpage. The syllabus contains all of the important information concerning examination and recitation dates and dates problem sets are due. If you misplace your copy of the course syllabus, get another from the professor or the T.A., or download a copy from the class website.

Planetarium Demonstration:

A planetarium demonstration is scheduled during the regular class time on the third day of class, Monday, 27 August. The Planetarium is located in 5033 Smith Laboratory; take the elevator in the northeast corner of Smith Lab to the fifth floor, turn right and you'll see the Planetarium.

Astronomy 2895:

The Department of Astronomy is now offering a two-semester one-credit hour seminar that is intended to introduce prospective astronomy majors to the undergraduate astronomy program at Ohio State. There will be introductory lectures on practical aspects of the major program, including course of study, careers in astronomy, observational facilities available to Ohio State faculty and students, the Center for Cosmology and Astro-Particle Physics (CCAPP) connection with the Department of Physics, and opportunities for engagement of undergraduate students (including a discussion of REU

opportunities, the OSU Astronomy Summer Undergraduate Research Program, the Ohio State University Astronomical Society, and OSU outreach opportunities). Each of the remaining sessions will feature an Ohio State faculty member, who will describe his or her research program at a level suitable for first-year undergraduates.

Astronomy majors are required to complete two semesters of Astron 2895. We strongly recommend that you take this course as early as possible in your program of study.

Roof Nights:

Roof Nights constitute what might be called a casual laboratory for the 1000-level introductory astronomy courses. Astronomy 2292 students are also cordially invited to attend. The telescopes on the roof of Smith Lab will be opened for you to enjoy the splendor of the Universe (or at least the inner Solar System) firsthand. The Roof Night schedule can be found through a link on the class webpage. The first few of these will be preceded by a planetarium demonstration (5033 Smith Laboratory) lasting about 45 minutes, though it will cover the same material as the scheduled Planetarium Demonstration on the second day of class. Starting times for Roof Nights will change throughout the quarter. And, yes, you can bring a friend.

Academic Misconduct:

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct (http://studentaffairs.osu.edu/info_for_students/csc.asp).

While we encourage students to work together on their problem sets (since teaching each other and verbally articulating astrophysical arguments are skills we want you to develop), the answers you turn in must be your own work and not simply copied off of another student's work. When you work with other students, you can work out a problem together, but then you should later re-work it independently to make sure you understand it and so that the work you submit is not simply a copy of someone else's solution. It is perfectly fine to trade insights and explanations, but we will not tolerate "distributed" work (e.g., “you work problems 1 – 5 and I'll do problems 6 – 10”).

There is an instructor's solution manual published for the textbook: you should not own a copy of this (you can only get it legitimately from the publisher by attesting that you are an instructor and they will check with your institution). You are forbidden to use the instructor's manual in any way. The professor wrote the manual and will recognize his own solutions (and has). Use of the instructor's manual solutions will be considered academic misconduct and will be vigorously prosecuted.

Examinations, of course, must be entirely your own work.

Evidence that academic misconduct has occurred will be turned over to the Committee on Academic Misconduct for disposition.

Students with Disabilities:

Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated, and should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Avenue; telephone 292-3307, TDD 292-0901; <http://www.ods.ohio-state.edu/>.

IMPORTANT: IT IS THE RESPONSIBILITY OF THE STUDENT TO BE FAMILIAR WITH ALL OF THE INFORMATION CONTAINED HERE. STUDENTS ARE ALSO RESPONSIBLE FOR ANY CORRECTIONS OR ADDENDA ANNOUNCED IN CLASS.

Astronomy 2292				
Stellar, Galactic, and Extragalactic Astronomy and Astrophysics				
Week	Date	Day	Topic	Text
1	7-Jan	M	Properties of Stars	Chapter 13
	9-Jan	W	Properties of Stars	
	11-Jan	F	Properties of Stars	
2	14-Jan	M	Stellar Atmospheres	Chapter 14
	16-Jan	W	<i>Recitation</i>	
	18-Jan	F	Stellar Atmospheres <i>Problem Set I due</i>	
3	21-Jan	M	MLK Day - NO CLASS	
	23-Jan	W	Stellar Interiors	Chapter 15
	25-Jan	F	Stellar Interiors	
4	28-Jan	M	Stellar Interiors	
	30-Jan	W	<i>Recitation</i>	
	1-Feb	F	Stellar Interiors <i>Problem Set II due</i>	
5	4-Feb	M	The Interstellar Medium	Chapter 16
	6-Feb	W	The Interstellar Medium	
	8-Feb	F	The Interstellar Medium	
6	11-Feb	M	<i>Recitation</i>	
	13-Feb	W	First Examination	
	15-Feb	F	Formation and Evolution of Stars	Chapter 17
7	18-Feb	M	Formation and Evolution of Stars	
	20-Feb	W	<i>Recitation</i>	
	22-Feb	F	Stellar Remnants <i>Problem Set III due</i>	Chapter 18
8	25-Feb	M	Stellar Remnants	
	27-Feb	W	Stellar Remnants	
	1-Mar	F	Our Galaxy	Chapter 19
9	4-Mar	M	Our Galaxy	
	6-Mar	W	<i>Recitation</i>	
	8-Mar	F	Second Examination	
10	11-Mar	M	SPRING BREAK	
	13-Mar	W	SPRING BREAK	
	15-Mar	F	SPRING BREAK	
11	18-Mar	M	Our Galaxy	
	20-Mar	W	Galaxies	Chapter 20
	22-Mar	F	Galaxies	
12	25-Mar	M	Galaxies	
	27-Mar	W	<i>Recitation</i>	
	29-Mar	F	Active Galaxies <i>Problem Set IV due</i>	Chapter 21
13	1-Apr	M	Active Galaxies	
	3-Apr	W	Clusters and Superclusters	Chapter 22
	5-Apr	F	Cosmology	Chapter 23
14	8-Apr	M	Cosmology	
	10-Apr	W	<i>Recitation</i>	
	12-Apr	F	History of the Universe <i>Problem Set V due</i>	Chapter 24
15	15-Apr	M	History of the Universe	
	17-Apr	W	<i>Recitation</i>	
	19-Apr	F	Third Examination	
16	22-Apr	M	<i>Recitation/Review Session</i>	
	TBD		Final Examination	

Course Bulletin Listing/Subject Area	Astronomy
Fiscal Unit/Academic Org	Astronomy - D0614
College/Academic Group	Mathematical And Physical Sci
Level/Career	Undergraduate
Course Number/Catalog	2292
Course Title	Stellar, Galactic, and Extragalactic Astronomy and Astrophysics
Transcript Abbreviation	Astrophysics
Course Description	Observational and physical properties of the sun and stars; stellar structure and evolution; interstellar medium; galaxies and cosmology.
Semester Credit Hours/Units	Fixed: 3

Offering Information

Length Of Course	14 Week
Flexibly Scheduled Course	Never
Does any section of this course have a distance education component?	No
Grading Basis	Letter Grade
Repeatable	No
Course Components	Lecture
Grade Roster Component	Lecture
Credit Available by Exam	Yes
Exam Type	EM Tests via Office of Testing
Admission Condition Course	No
Off Campus	Never
Campus of Offering	Columbus

Prerequisites and Exclusions

Prerequisites/Corequisites	Astron 291 or 2291 or permission of instructor.
Exclusions	Not open to students with credit for Astron 292.

Cross-Listings

Cross-Listings

Subject/CIP Code

Subject/CIP Code	40.0202
Subsidy Level	Baccalaureate Course
Intended Rank	Freshman, Junior, Sophomore, Senior

Quarters to Semesters

Quarters to Semesters	Semester equivalent of a quarter course (e.g., a 5 credit hour course under quarters which becomes a 3 credit hour course under semesters)
List the number and title of current course being converted	Astron 292, Stellar, Galactic, and Extragalactic Astronomy and Astrophysics

Requirement/Elective Designation

Required for this unit's degrees, majors, and/or minors
General Education course

Course Details

Course goals or learning objectives/outcomes

Content Topic List

- Properties, structure, and evolution of stars.
- The interstellar medium, star formation, and stellar remnants.
- Properties of the Milky Way Galaxy.
- Normal and active galaxies.
- Large-scale structure of the universe, cosmology, and history of the universe.

Attachments

- Astron2292.pdf

(Other Supporting Documentation. Owner: Peterson, Bradley Michael)

Comments

- Needs to go back to D. Andereck. *(by Vankeerbergen, Bernadette Chantal on 11/10/2010 08:15 AM)*

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Peterson, Bradley Michael	10/21/2010 01:54 PM	Submitted for Approval
Approved	Peterson, Bradley Michael	10/21/2010 02:45 PM	Unit Approval
Approved	Andereck, Claude David	11/09/2010 04:41 PM	College Approval
Revision Requested	Vankeerbergen, Bernadette Chantal	11/10/2010 08:15 AM	ASCCAO Approval
Submitted	Peterson, Bradley Michael	11/10/2010 10:09 AM	Submitted for Approval
Revision Requested	Peterson, Bradley Michael	11/10/2010 05:55 PM	Unit Approval
Submitted	Peterson, Bradley Michael	11/10/2010 06:05 PM	Submitted for Approval
Approved	Peterson, Bradley Michael	11/10/2010 06:13 PM	Unit Approval
Revision Requested	Andereck, Claude David	11/11/2010 09:43 AM	College Approval
Submitted	Peterson, Bradley Michael	11/16/2010 04:51 PM	Submitted for Approval
Approved	Peterson, Bradley Michael	11/16/2010 04:53 PM	Unit Approval
Revision Requested	Andereck, Claude David	11/23/2010 09:57 AM	College Approval
Submitted	Peterson, Bradley Michael	11/24/2010 04:18 PM	Submitted for Approval
Approved	Peterson, Bradley Michael	11/24/2010 04:18 PM	Unit Approval
Approved	Andereck, Claude David	11/26/2010 09:53 AM	College Approval
Pending Approval	Hanlin, Deborah Kay Vankeerbergen, Bernadette Chantal Meyers, Catherine Anne Jenkins, Mary Ellen Bigler Nolen, Dawn	11/26/2010 09:53 AM	ASCCAO Approval