

<b>Fiscal Unit/Academic Org</b>	Astronomy - D0614
<b>Administering College/Academic Group</b>	Mathematical And Physical Sci
<b>Co-administering College/Academic Group</b>	Arts And Sciences
<b>Semester Conversion Designation</b>	Converted with minimal changes to program goals and/or curricular requirements (e.g., sub-plan/specialization name changes, changes in electives and/or prerequisites, minimal changes in overall structure of program, minimal or no changes in program goals or content)
<b>Current Program/Plan Name</b>	Astronomy
<b>Proposed Program/Plan Name</b>	Astronomy and Astrophysics
<b>Program/Plan Code Abbreviation</b>	ASTRON-BS
<b>Current Degree Title</b>	Bachelor of Science

## Credit Hour Explanation

Program credit hour requirements		A) Number of credit hours in current program (Quarter credit hours)	B) Calculated result for 2/3rds of current (Semester credit hours)	C) Number of credit hours required for proposed program (Semester credit hours)	D) Change in credit hours
Total minimum credit hours required for completion of program		71	47.3	47	0.3
Required credit hours offered by the unit	Minimum	22	14.7	13	1.7
	Maximum	22	14.7	13	1.7
Required credit hours offered outside of the unit	Minimum	49	32.7	34	1.3
	Maximum	49	32.7	35	2.3
Required prerequisite credit hours not included above	Minimum	30	20.0	25	5.0
	Maximum	35	23.3	25	1.7

**Explain any change in credit hours if the difference is more than 4 semester credit hours between the values listed in columns B and C for any row in the above table**

The minimum required prerequisites was lower under quarters because it was possible to take an accelerated first year calculus sequence (Math 161-162) instead of the regular sequence Math 151-152-153. This option is not available in the semester calendar.

## Program Learning Goals

Note: these are required for all undergraduate degree programs and majors now, and will be required for all graduate and professional degree programs in 2012. Nonetheless, all programs are encouraged to complete these now.

<b>Program Learning Goals</b>	<ul style="list-style-type: none"> <li>• Undergraduate Astronomy and Astrophysics majors acquire a basic mastery of the four fundamental areas of physics.</li> <li>• Undergraduate Astronomy and Astrophysics majors develop powerful analytical and problem solving skills in areas involving astrophysics, physics, and mathematics</li> <li>• Undergraduate Astronomy and Astrophysics majors acquire a basic mastery of the fundamentals of astronomy and astrophysics.</li> <li>• Undergraduate Astronomy and Astrophysics majors acquire a basic mastery of data reduction and error analysis.</li> <li>• Undergraduate Astronomy and Astrophysics majors are able to effectively communicate their physical understanding both professionally and colloquially (orally and in writing).</li> </ul>
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## Assessment

Assessment plan includes student learning goals, how those goals are evaluated, and how the information collected is used to improve student learning. An assessment plan is required for undergraduate majors and degrees. Graduate and professional degree programs are encouraged to complete this now, but will not be required to do so until 2012.

**Is this a degree program (undergraduate, graduate, or professional) or major proposal? Yes**

**Does the degree program or major have an assessment plan on file with the university Office of Academic Affairs? Yes**

**Summarize how the program's current quarter-based assessment practices will be modified, if necessary, to fit the semester calendar.**

Assessment plan includes student learning goals, how these goals are evaluated, and how the information is collected is used to improve student learning.

## **Program Specializations/Sub-Plans**

If you do not specify a program specialization/sub-plan it will be assumed you are submitting this program for all program specializations/sub-plans.

## **Pre-Major**

**Does this Program have a Pre-Major? No**

## **Attachments**

- CurriculumMap.pdf  
*(Curricular Map(s). Owner: Peterson, Bradley Michael)*
- AstronomyMajor.pdf  
*(Program Proposal. Owner: Peterson, Bradley Michael)*
- Astronomy and Astrophysics BS cover letter.doc: NMS Division of Arts and Sciences cover letter  
*(Letter from the College to OAA. Owner: Andereck, Claude David)*

## **Comments**

- Approved with contingencies by CCI Sciences Subcommittee. Feedback will come via e-mail from J. Fredal or C. Daniels (CCI Sciences Subcommittee co-chairs). *(by Vankeerbergen, Bernadette Chantal on 01/05/2011 08:51 AM)*

## Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Peterson, Bradley Michael	10/21/2010 02:27 PM	Submitted for Approval
Approved	Peterson, Bradley Michael	10/21/2010 02:48 PM	Unit Approval
Revision Requested	Andereck, Claude David	10/27/2010 02:00 PM	College Approval
Submitted	Peterson, Bradley Michael	10/29/2010 05:22 PM	Submitted for Approval
Approved	Peterson, Bradley Michael	10/29/2010 05:23 PM	Unit Approval
Revision Requested	Andereck, Claude David	11/05/2010 04:05 PM	College Approval
Submitted	Peterson, Bradley Michael	11/06/2010 09:57 PM	Submitted for Approval
Approved	Peterson, Bradley Michael	11/06/2010 10:02 PM	Unit Approval
Approved	Andereck, Claude David	12/29/2010 01:30 PM	College Approval
Revision Requested	Vankeerbergen, Bernadette Chantal	01/05/2011 08:51 AM	ASCCAO Approval
Submitted	Peterson, Bradley Michael	01/07/2011 03:13 PM	Submitted for Approval
Approved	Peterson, Bradley Michael	01/07/2011 03:16 PM	Unit Approval
Revision Requested	Andereck, Claude David	01/12/2011 11:41 AM	College Approval
Submitted	Peterson, Bradley Michael	02/18/2011 03:53 PM	Submitted for Approval
Approved	Peterson, Bradley Michael	02/19/2011 11:23 AM	Unit Approval
Revision Requested	Andereck, Claude David	02/19/2011 12:18 PM	College Approval
Submitted	Peterson, Bradley Michael	02/19/2011 02:40 PM	Submitted for Approval
Approved	Peterson, Bradley Michael	02/19/2011 02:40 PM	Unit Approval
Approved	Andereck, Claude David	02/21/2011 03:28 PM	College Approval
Pending Approval	Nolen, Dawn Jenkins, Mary Ellen Bigler Meyers, Catherine Anne Vankeerbergen, Bernadette Chantal Hanlin, Deborah Kay	02/21/2011 03:28 PM	ASCCAO Approval

Division of Natural and Mathematical Sciences

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February 21, 2011

Larry Krissek  
Chair, Arts and Sciences CCI

Dear Larry:

It is a pleasure to forward to you the proposal for the BS major in Astrophysics under semesters. The major has been minimally modified from its present quarter version. Please note that the Department of Astronomy is requesting that the name of the major be changed from Astronomy to Astronomy and Astrophysics. The Department of Physics and the Department of Astronomy have a signed MOU (included) that addresses how they will administer the program going forward.

Beyond my own review of the documents, the proposal has been discussed by colleagues from other NMS units at a meeting on October 27, 2010. Feedback from that discussion, and from the CCI Sciences Subcommittee, has been incorporated in the proposal.

If you have any questions, I would be happy to address them.

Sincerely,



David Andereck  
Professor of Physics  
Associate Dean of Natural and Mathematical Sciences, College of Arts and Sciences



**Department of Astronomy**

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10 February 2011

Office of Academic Affairs  
203 Bricker Hall  
190 North Oval Mall  
CAMPUS

Re: Astronomy Undergraduate Major Program under Semesters

Dear colleagues,

The Department of Astronomy currently offers two degree programs, a Bachelor of Science with a major in Astronomy and Doctor of Philosophy in Astronomy.

The Department additionally offers a minor program in Astronomy. The Department also awards a Master's of Science in Astronomy to students who complete the required graduate core courses and pass an oral examination, usually the same examination that admits students to candidacy for the PhD; students are not admitted for a Master's degree only, so we do not list this as a separate program.

As outlined in the following Program Rationale, we propose to change the name of the undergraduate major and minor programs from "Astronomy" to "Astronomy and Astrophysics." On account of the significant physics content of the major and minor programs in astronomy, we are proposing that the "Astronomy and Astrophysics" major and minor programs be recognized as interdisciplinary programs, jointly managed by the Departments of Physics and Astronomy, with the Department of Astronomy as the home department, as described in the accompanying Memorandum of Understanding between the Departments of Physics and Astronomy.

Curricular changes are made through the Department's standing Curriculum Committee upon approval by the entire regular faculty. In the current conversion to semesters, the Curriculum Committee did not recommend any changes to the undergraduate major program because the current curriculum is deemed to be academically sound, up to date, and will transfer transparently to a semester schedule.

The plan proposed here has been presented to the Astronomy faculty and they have voted to support it.

As chair of the Department, I recommend approval of the undergraduate major program as submitted here.

Sincerely yours,

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

Bradley M. Peterson  
Professor and Chair

## MEMORANDUM OF UNDERSTANDING

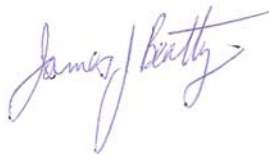
The Departments of Astronomy and Physics recognize that the undergraduate major program in astronomy has strong commonalities with the Advanced Physics Option of the undergraduate major in physics. In both programs, the majors are being prepared for graduate work that requires background at the intermediate to advanced level in classical mechanics, quantum mechanics, electricity and magnetism, and thermodynamics and statistical mechanics, and both majors require similar a background in advanced mathematics. The principal differences are that physics majors take additional advanced laboratory classes and astronomy majors take a minimum of four additional courses in astronomy and astrophysics. We note that many students choose to double-major in physics and astronomy, and this has historically been encouraged by both departments. But given the large physics component to the astronomy major program, the astronomy major is essentially a joint program that is administered by the Department of Astronomy.

The Departments of Physics and Astronomy agree that the educational opportunities afforded our joint majors and our respective majors are enhanced by stronger interaction between the two programs. Since the Astronomy major already includes significant Physics content, we propose that it be formally recognized as an interdisciplinary program, jointly managed by the Departments of Astronomy and Physics, with Astronomy as the home department. Students in this interdisciplinary program would be considered as majors in both departments, although they would choose an advisor (or be assigned one) from just one department. To formalize this change, the Departments also agree that the name of the astronomy major program will change from "Astronomy" to "Astronomy and Astrophysics," in recognition of the large physics and astrophysics component of the astronomy major program. The name of the undergraduate minor in astronomy will also be changed from "Astronomy" to "Astronomy and Astrophysics." It is proposed that these changes take effect no later than Autumn Semester 2012, as a part of the change in the academic calendar from quarters to semesters.

As a practical matter, the two Departments agree that communication on curricular and scheduling issues can be improved by assigning a member of the Physics Department Undergraduate Studies Committee as a voting member of the Astronomy Department Undergraduate Studies and Curriculum committees and assigning a member of the Astronomy Department Undergraduate Studies and Curriculum committees as a voting member of the Physics Department Undergraduate Studies Committee. It is proposed that this take effect no later than Autumn Quarter 2011.



Bradley M. Peterson  
Professor and Chair of Astronomy



James J. Beatty  
Professor and Chair of Physics

## **Program Rationale**

The Astronomy Undergraduate Major program maps easily from quarters to semesters. Nearly all the Astronomy courses are 5-credit hours and these transfer trivially to 3-credit hour semester courses. The one course that does not is Astron 295, a 1-credit hour seminar for first-year prospective majors. This informal seminar will be reduced from 20 sessions under the quarter calendar to 14 under semesters.

We have examined the proposed changes in Physics, Math, and CSE (in which our students take both prerequisites and major courses), and our conversion plans are consistent with theirs.

The only change we propose is changing the name of the program from “Astronomy” to “Astronomy and Astrophysics”: this is a long-overdue change that better represents what our students are learning. “Astrophysics” is less likely to be misunderstood by prospective employers of our BS students; many people equate “astronomy” with stargazing or astrophotography or, even worse, “astrology,” and this more accurate degree name will better serve our students who do not continue in the field.

The undergraduate major program was most recently revised in 1997, with the addition of Astronomy 681 and 682 to the major program. Minor changes in 2009 include elimination of Phys 664 (Theoretical Mechanics) as a required course, addition of CSE 202 (Introduction to C++ Programming), and addition of two units of Astron 295 (Undergraduate Seminar) as a degree requirement.

<b>Astronomy and Astrophysics Major Program Semesters</b>	<b>Credit Hours</b>	<b>Notes</b>
<b>Prerequisites</b>		
Math 1151	5	
Math 1172	5	
Math 2173	5	
Phys 1250/1250H	5	
Phys 1251/1251H	5	
<b>Total Prereqs</b>	<b>25</b>	
<b>Major Courses</b>		
Astron 2895	1	
Astron 2291	3	
Astron 2292	3	
Astron 3350	3	
Astron 5681 or Astron 5682	3	
subtotal Astronomy	13	
Phys 2300	4	
Phys 2301	4	
Phys 3700	3	
Phys 5400/5400H	4	
Phys 5500/5500H	4	
Phys 5401H or 5501H or 5300 or 3470	4	Phys 3470 is 3 cr; others are 4
Phys 5600	4	
subtotal Physics	27	
Math 2174	3	
Math 4551	3	
subtotal Math	6	
CSE 1222	2	
<b>Total Major</b>	<b>48</b>	(47 if Phys 3470)
<b>Total Program</b>	<b>73</b>	(72 if Phys 3470)
<b>Other recommended</b>		
Astron 2193	var	individual studies
Astron 2194	var	group studies
Astron 4193	var	individual studies
Astron 4194	var	group studies
Astron 4998	var	Non-thesis research
Astron 4999	var	Non-honors thesis research
Astron 4999H	var	Honors thesis research
Astron 5681 or 5682	3	One is required, both are recommended
Phys 5401H or 5501H	4	E&M II or QM II. One is required, both are recommended
Phys 5300	4	Theoretical mechanics
Note: Honors versions of any course may be substituted.		



# Major Program Form

## The College of Arts and Sciences

Name: \_\_\_\_\_ Major: ASTRONOMY  
 OSU NAME.#: \_\_\_\_\_ Degree Sought: BA \_\_\_\_\_ BS X BA Jur \_\_\_\_\_  
 Columbus Address: \_\_\_\_\_  
 Phone: \_\_\_\_\_ Expected Qtr and Year of Graduation: \_\_\_\_\_  
 Alt Phone: \_\_\_\_\_

Have you filed a Degree Application in the College Office? Yes \_\_\_\_\_ No \_\_\_\_\_

(NOTE: This form is NOT a degree application)

Please check whether this is: original \_\_\_\_\_ revision \_\_\_\_\_

If completing two majors list both here: (1) \_\_\_\_\_ (2) \_\_\_\_\_

(NOTE: You need to file a separate Major Program Form for each major)

### Part A. Required Prerequisites (Minimum grade of "C-" per course and minimum grade average of "C" required)

	Hrs	Grade		Hrs	Grade
Math 151	5	_____	Physics 131	5	_____
Math 152	5	_____	Physics 132	5	_____
Math 153	5	_____	Physics 133	5	_____
Math 254	5	_____			

### Part B. Major Program (same minimum grade requirements as Part A)

Astronomy 291	5	_____	Physics 261	4	_____
Astronomy 292	5	_____	Physics 262	4	_____
Astronomy 295	1 x 2	_____	Physics 263	4	_____
Astronomy 350	5	_____	Physics 416	4	_____
Astronomy 681	5	_____*	Physics 555	4	_____
Astronomy 682	5	_____*	Physics 656	4	_____
CSE 202	4	_____	Physics 631	4	_____
Math 415	4	_____	Physics 632	4	_____
Math 513	3	_____	Physics 621	4	_____
Math 568	4	_____			_____+
_____	_____	_____+	_____	_____	_____+

\* Note: Only one of Astronomy 681 and 682 is required

+ Note: For substitutions or additions to Major Program only  
 Honors versions of any course may be substituted

Total Hours of Part B \_\_\_\_\_

#### FOR OFFICE USE ONLY

Date of Exit Interview \_\_\_\_\_

Distribute one copy to: Advisor \_\_\_\_\_  
 Student \_\_\_\_\_  
 College Office \_\_\_\_\_

\_\_\_\_\_  
 (Signature of Faculty Advisor and date)

Name of Advisor: \_\_\_\_\_  
 Campus Phone: \_\_\_\_\_

# Major Program Form

## The College of Arts and Sciences

Name: \_\_\_\_\_ Major: ASTRONOMY AND ASTROPHYSICS  
 OSU NAME.#: \_\_\_\_\_ Degree Sought: BA \_\_\_\_\_ BS X BA Jur \_\_\_\_\_  
 Columbus Address: \_\_\_\_\_  
 Phone: \_\_\_\_\_ Expected Semester/Year of Graduation: \_\_\_\_\_  
 Alt Phone: \_\_\_\_\_

Have you filed a Degree Application in the College Office? Yes \_\_\_\_\_ No \_\_\_\_\_

(NOTE: This form is NOT a degree application)

Please check whether this is: original \_\_\_\_\_ revision \_\_\_\_\_

If completing two majors list both here: (1) \_\_\_\_\_ (2) \_\_\_\_\_

(NOTE: You need to file a separate Major Program Form for each major)

### Part A. Required Prerequisites (Minimum grade of "C-" per course and minimum grade average of "C" required)

	Hrs	Grade		Hrs	Grade
Math 1151	5	_____	Physics 1250	5	_____
Math 1172	5	_____	Physics 1251	5	_____
Math 2173	5	_____			

### Part B. Major Program (same minimum grade requirements as Part A)

Astron 2291	3	_____	Physics 2300	4	_____
Astron 2292	3	_____	Physics 2301	4	_____
Astron 2895	1	_____	Physics 3470	3	_____**
Astron 3350	3	_____	Physics 3700	3	_____
Astron 5681	3	_____*	Physics 5300	4	_____**
Astron 5682	3	_____*	Physics 5400	4	_____
CSE 1222	2	_____	Physics 5401H	4	_____**
Math 2174	3	_____	Physics 5500	4	_____
Math 4551	3	_____	Physics 5501H	4	_____**
_____	_____	_____+	Physics 5600	4	_____
_____	_____	_____+	_____	_____	_____+

\* Note: Only one of Astron 5681 and 5682 is required

\*\* Note: Only one of Physics 3470, 5300, 5401H, and 5501H is required

+ Note: For substitutions or additions to Major Program only

Honors versions of any course may be substituted.

Total Hours of Part B \_\_\_\_\_

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#### FOR OFFICE USE ONLY

Date of Exit Interview \_\_\_\_\_

Distribute one copy to: Advisor  
 Student  
 College Office

\_\_\_\_\_  
 (Signature of Faculty Advisor and date)

Name of Advisor: \_\_\_\_\_

Campus Phone: \_\_\_\_\_

Year	Autumn			Spring		
	Course	Credit Hours	Notes	Course	Credit Hours	Notes
<b>1</b>	Math 1151	5	Prereq [GEC: Math]	Math 1172	5	Prereq
	Phys 1250/1250H	5	Prereq [GEC: Science]	Phys 1251/1251H	5	Prereq
	Astron 2895	1	Major	Biol 1113	4	[GEC:Science]
	CSE 1222	2	Major	GEC	3	
	Artssci 1100	1	Survey			
	GEC	3				
		<b>17</b>			<b>17</b>	
<b>2</b>	Astron 2291	3	Major	Astron 2292	3	Major
	Math 2173	5	Prereq	Math 2174	3	Major
	Math 4551	3	Major	Phys 2301	4	Major
	Phys 2300	4	Major	Phys 3700	3	Major [GEC: data analysis]
	GEC	3		GEC	3	
		<b>18</b>			<b>16</b>	
<b>3</b>	Astron 3350 (or GEC)	3	Major	Astron 5681/5682	3	Major
	Phys 5400/5400H	4	Major	Phys 5401H	4	Major/Recommended
	Phys 5500/5500H	4	Major	Phys 5501H	4	Major/Recommended
	GEC	3		GEC	4	
	GEC	3				
		<b>17</b>			<b>15</b>	
<b>4</b>	Phys 5600	4	Major	Astron 5681/5682	3	Recommended
	Astron 3350 (or GEC)	3		Phys 5300	4	Recommended
	GEC	4		GEC	4	
	GEC	3		GEC	3	
	GEC	3				
		<b>17</b>			<b>14</b>	
	Total hours:	<b>131</b>				
	Required credit hours, including prereqs:			73	73/131 = 55.73%	
	GECs:			58	58/131 = 44.27%	
Note: Honors versions of any course may be substituted						

Year	Autumn			Winter			Spring		
	Course	Credit Hours	Notes	Course	Credit Hours	Notes	Course	Credit Hours	Notes
<b>1</b>	Math 151	5	Prereq [GEC: Math]	Math 152	5		Math 153	5	Prereq
	Phys 131	5	Prereq [GEC: Science]	Phys 132	5		Phys 133	5	Prereq
	Astron 295	1	Major	Astron 295	1		CSE 202	4	Prereq
	Artssci 100	1	Survey	GEC	5	(foreign language)	GEC	5	(foreign language)
	GEC	5							
		<b>17</b>			<b>16</b>			<b>19</b>	
<b>2</b>	Astron 291	5	Major	Astron 292	5	Major	Math 415	4	Major
	Math 254	5	Prereq	Math 513	3	Major	Math 568	3	Major
	Phys 261	4	Major	Phys 262	4	Major	Phys 263	4	Major
	GEC	5	(foreign language)	GEC	5	(foreign language)	Phys 416	4	Prereq [GEC: data analysis]
		<b>19</b>			<b>17</b>			<b>15</b>	
<b>3</b>	Astron 3350 (or GEC)	5	Major	Astron 681 or 682	5	Major	Phys 664	4	Recommended
	Phys 555	4	Major	Phys 656	4	Major	GEC	5	
	Phys 631	4	Major	Phys 632	4	Major	GEC	5	Major/Recommended
	GEC	3		GEC	5		GEC	5	
		<b>16</b>			<b>18</b>			<b>19</b>	
<b>4</b>	Phys 621	4	Major	Astron 681 or 682	5	Recommended	GEC	5	
	Astron 3350 (or GEC)	5		Phys 622	4	Recommended	GEC	5	
	GEC	5		Third Writing Course	3		elective	3	
		<b>14</b>			<b>12</b>			<b>13</b>	
	Total hours:	<b>207</b>							

Note: Honors version of any course may be substituted.

Requirements	Semester Course Number	Course Title	Semester Units	Quarter Equivalent Course Number	Quarter Credits	Notes
<b>Arts and Sciences Survey</b>	Artssci 1100	Arts and Sciences Survey	1	Artssci 100	1	Same content
<b>Required Astronomy</b>	Astron 2291	Basic Astrophysics and Planetary Astronomy	3	Astron 291	5	Same content
	Astron 2292	Stellar, Galactic, and Extragalactic Astronomy and Astrophysics	3	Astron 292	5	Same content
	Astron 2895	Seminar	1	Astron 295	1	Some content reduction as requirement reduced from two quarters to one semester.
	Astron 3350	Methods of Astronomical Observation and Data Analysis	3	Astron 350	5	Same content
	Astron 5681	Principles of Stellar Evolution and Nucleosynthesis	3	Astron 681/ Phys 681	5	Same content
	Astron 5682	Introduction to Cosmology	3	Astron 682/ Phys 682		Same content
<b>Required Programming</b>	CSE 1222	Intro to C++	2	CSE 202	4	Same content
<b>Prerequisite Math</b>	Math 1151	Calculus I	5	Math 151	5	Semester sequence has same content as quarter sequence
	Math 1172	Engineering Mathematics A	5	Math 152	5	
				Math 153	5	
	Math 2173	Engineering Mathematics B	5	Math 254	5	Combines material from Math 254, 152, and 153
<b>Required Math</b>	Math 2174	Engineering Mathematics C	3	Math 415	4	Merges Math 415 and Math 568
	Math 4551	Vector Analysis	3	Math 513	3	Same content
				Phys 570		
<b>Prerequisite Physics</b>	Phys 1250/1250H	Mechanics, Thermal Physics, Waves	5	Phys 131	5	Semester sequence has same content as quarter sequence
	Phys 1251/1251H	E&M, Optics, Modern Physics	5	Phys 132	5	
				Phys 133	5	
<b>Required/Recommended Physics</b>	Phys 2300	Dynamics of Particles and Waves I	4	Phys 261	4	Semester sequence has same content as quarter sequence
	Phys 2301	Dynamics of Particles and Waves II	4	Phys 262	4	
				Phys 263	4	
	Phys 3470	Modern Optics	3	Phys 570	4	Same content
	Phys 3700	Methods in Experimental Physics	3	Phys 416	4	Same content
	Phys 5300	Theoretical Mechanics	4	Phys 664	4	Enhanced content
	Phys 5400/5400H	E&M I	4	Phys 555	4	Semester sequence has same content as quarter sequence
	Phys 5401H	E&M II	4	Phys 656	4	
				Phys 657	4	
	Phys 5500/5500H	Quantum Mechanics I	4	Phys 631	4	Semester sequence has same content as quarter sequence
	Phys 5501H	Quantum Mechanics II	4	Phys 632	4	
				Phys 633	4	
	Phys 5600	Statistical Physics	4	Phys 621	4	Semester course has all of 621 and part of 622
				Phys 622	4	
<b>Other Astronomy</b>	Astron 2193	individual studies	var	Astron 293	var	Same content
	Astron 2194	group studies	var	Astron 294	var	Same content
	Astron 4193	individual studies	var	Astron 693	var	Same content
	Astron 4194	group studies	var	Astron 694	var	Same content
	Astron 4998	non-thesis research	var	Astron 693	var	Same content
	Astron 4999	thesis research	var	Astron 693	var	Same content
	Astron 4999H	honors thesis research	var	Astron H783	var	Same content

Note: Honors versions of any course may be substituted.

**Transition Policy:**

Students who began their degree under quarters will not be penalized as the university moves to a semester schedule, either in terms of progress towards their degree or their expected date of graduation. No special transition plan is necessary for the major or minor courses in Astronomy: nearly all of these courses translate directly from 5-hour quarter courses to 3-hour semester courses. The only exception is Astron 295, a 1-hour quarter seminar that students must take twice. This will be replaced with a 1-hour semester seminar, Astron 2895, which students will take only once. As of Autumn 2012, any student who has completed either one quarter of Astron 295 or one semester of Astron 2895 will be deemed to have met the seminar requirement.

Transition policies for the required or prerequisite physics and math courses will be established by the Departments of Physics and Mathematics, respectively. Students can minimize their own transition difficulties by making sure of the following:

2011-12 first-year students should make certain that they have completed Mathematics 153 and Physics 133 by no later than Spring 2012.

2011-12 second-year students should make certain that they complete Math 254, 415, 513, and 568 and Phys 263 by no later than Spring 2012,

2011-12 third year students should make certain that they complete Phys 632 and 656 by no later than Spring 2012.

Astronomy advisors will remind astronomy and astrophysics majors of the necessity to complete these course sequences throughout the 2011-12 academic year.

Transition Plan for 2011-12 First-Year Students (Class of 2015)											
	Course	Credit Hours	Notes		Course	Credit Hours	Notes		Course	Credit Hours	Notes
<b>Year</b>	<b>Autumn Quarter 2011</b>				<b>Winter Quarter 2012</b>				<b>Spring Quarter 2012</b>		
<b>1</b>	Math 151	5	Prereq		Math 152	5			Math 153	5	Prereq
	Phys 131	5	Prereq		Phys 132	5			Phys 133	5	Prereq
	Astron 295	1	Major		Astron 295	1			CSE 202	4	Major
	Artssci 100	1	Survey		GEC	5			GEC	5	
	GEC	5									
		<b>17</b>				<b>16</b>				<b>19</b>	
	<b>Autumn Semester 2012</b>				<b>Spring Semester 2013</b>						
<b>2</b>	Astron 2291	3	Major		Astron 2292	3	Major				
	Math 2173	5	Prereq		Math 2174	3	Major				
	Math 4551	3	Major		Phys 2301	4	Major				
	Phys 2300	4	Major		Phys 3700	3	Major				
	GEC	3			GEC	3					
		<b>18</b>				<b>16</b>					
	<b>Autumn Semester 2013</b>				<b>Spring Semester 2014</b>						
<b>3</b>	GEC	3			Astron 5681	3	Major				
	Phys 5400/5400H	4	Major		Phys 5401H	4	Major/Recommended				
	Phys 5500/5500H	4	Major		Phys 5501H	4	Major/Recommended				
	GEC	3			GEC	4					
	GEC	3									
		<b>17</b>				<b>15</b>					
	<b>Autumn Semester 2014</b>				<b>Spring Semester 2015</b>						
<b>4</b>	Phys 5600	4	Major		Astron 5682	3	Recommended				
	Astron 3350	3			Phys 5300	4	Recommended				
	GEC	4			GEC	4					
	GEC	3			GEC	3					
	GEC	3									
		<b>17</b>				<b>14</b>					
Note: Honors versions of any course may be substituted.											

Transition Plan for 2011-12 Second-Year Students (Class of 2014)									
	Course	Credit Hours	Notes	Course	Credit Hours	Notes	Course	Credit Hours	Notes
<b>Year</b>	<b>Autumn Quarter 2010</b>			<b>Winter Quarter 2011</b>			<b>Spring Quarter 2011</b>		
<b>1</b>	Math 151	5	Prereq	Math 152	5		Math 153	5	Prereq
	Phys 131	5	Prereq	Phys 132	5		Phys 133	5	Prereq
	Astron 295	1	Major	Astron 295	1		CSE 202	4	Major
	Artssci 100	1	Survey	GEC	5		GEC	5	
	GEC	5							
		<b>17</b>			<b>16</b>			<b>19</b>	
	<b>Autumn Quarter 2011</b>			<b>Winter Quarter 2012</b>			<b>Spring Quarter 2012</b>		
<b>2</b>	Astron 291	5	Major	Astron 292	5	Major	Math 415	4	Major
	Math 254	5	Prereq	Math 513	3	Major	Math 568	3	Major
	Phys 261	4	Major	Phys 262	4	Major	Phys 263	4	Major
	GEC	5		GEC	5		Phys 416	4	Major
		<b>19</b>			<b>17</b>			<b>15</b>	
	<b>Autumn Semester 2012</b>			<b>Spring Semester 2013</b>					
<b>3</b>	Astron 3350	3		Astron 5682	3	Major			
	Phys 5400/5400H	4	Major	Phys 5401H	4	Major/Recommended			
	Phys 5500/5500H	4	Major	Phys 5501H	4	Major/Recommended			
	GEC	3		GEC	4				
	GEC	3							
		<b>17</b>			<b>15</b>				
	<b>Autumn Semester 2013</b>			<b>Spring Semester 2014</b>					
<b>4</b>	Phys 5600	4	Major	Astron 5681	3	Recommended			
	GEC	3		Phys 5300	4	Recommended			
	GEC	4		GEC	4				
	GEC	3		GEC	3				
	GEC	3							
		<b>17</b>			<b>14</b>				
Note: Honors version of any course may be substituted.									



<b>Transition Plan for 2011-12 Third-Year Students (Class of 2013)</b>									
	Course	Credit Hours	Notes	Course	Credit Hours	Notes	Course	Credit Hours	Notes
<b>Year</b>	<b>Autumn Quarter 2009</b>			<b>Winter Quarter 2010</b>			<b>Spring Quarter 2010</b>		
<b>1</b>	Math 151	5	Prereq	Math 152	5		Math 153	5	Prereq
	Phys 131	5	Prereq	Phys 132	5		Phys 133	5	Prereq
	Astron 295	1	Major	Astron 295	1		CSE 202	4	Major
	Artssci 100	1	Survey	GEC	5		GEC	5	
	GEC	5							
		<b>17</b>			<b>16</b>			<b>19</b>	
	<b>Autumn Quarter 2010</b>			<b>Winter Quarter 2011</b>			<b>Spring Quarter 2011</b>		
<b>2</b>	Astron 291	5	Major	Astron 292	5	Major	Math 415	4	Major
	Math 254	5	Prereq	Math 513	3	Major	Math 568	3	Major
	Phys 261	4	Major	Phys 262	4	Major	Phys 263	4	Major
	GEC	5		GEC	5		Phys 416	4	Major
		<b>19</b>			<b>17</b>			<b>15</b>	
	<b>Autumn Quarter 2011</b>			<b>Winter Quarter 2012</b>			<b>Spring Quarter 2012</b>		
<b>3</b>	GEC	5	Major	Astron 681	5	Major	Phys 664	4	Recommended
	Phys 555	4	Major	Phys 656	4	Major	GEC	5	
	Phys 631	4	Major	Phys 632	4	Major	GEC	5	
	GEC	3		GEC	5		GEC	5	
		<b>16</b>			<b>18</b>			<b>19</b>	
	<b>Autumn Semester 2012</b>			<b>Spring Semester 2013</b>					
<b>4</b>	Phys 5600	4	Major	Astron 5682	3	Recommended			
	Astron 3350	3	Major	Phys 5300	4	Recommended			
	GEC	4		GEC	4				
	GEC	3		GEC	3				
	GEC	3							
		<b>17</b>			<b>14</b>				
Note: Honors version of any course may be substituted.									

Required Astronomy Courses	Goal #1	Goal #2	Goal #3	Goal #4	Goal #5
Astron 2291	intermediate	intermediate	beginning		
Astron 2292	intermediate	intermediate	beginning		
Astron 2895			beginning		
Astron 3350		intermediate	intermediate	intermediate	intermediate
Astron 5681	advanced	advanced	advanced		
Astron 5682	advanced	advanced	advanced		
Other Required Courses					
Math 2174		intermediate			
Math 4551		advanced			
Phys 2300	intermediate	intermediate			
Phys 2301	intermediate	intermediate			
Phys 3470	advanced	advanced			
Phys 5300	advanced	advanced		advanced	
Phys 5400/5400H	advanced	advanced			
Phys 5401H	advanced	advanced			
Phys 5500/5500H	advanced	advanced			
Phys 5501H	advanced	advanced			
Phys 5600	advanced	advanced			
Rerequisite Courses					
CSE 1222		beginning			
Math 1151		beginning			
Math 1172		beginning			
Math 2173		beginning			
Phys 1250/1250H	beginning	intermediate			
Phys 1251/1251H	beginning	beginning			
Phys 3700	intermediate	intermediate		intermediate	
Elective Courses					
Phys 5300	advanced	advanced		advanced	
Astron 5681/5682 (only one required)	advanced	advanced	advanced	advanced	
Astron 4998/4999/4999H			advanced		advanced
Astron 2193			intermediate		advanced
Astron 2194			intermediate		
Astron 4193			advanced		advanced
Astron 4194			advanced		
writing courses					intermediate