

Date Submitted: 08/16/19 11:59 am

Viewing: **SPACPH : Space and Planetary Sciences, Doctor of Philosophy**

Last approved: 05/21/19 11:06 am

Last edit: 08/30/19 5:24 pm

Changes proposed by: pkoski

Catalog Pages Using this Program
[Space and Planetary Sciences \(SPAC\)](#)

Submitter:	User ID:	pkoski kkuleza	Phone:	5902 57456
Program Status	Active			
Academic Level	Graduate			
Type of proposal	Major/Field of Study			
Select a reason for this modification				
Making Minor Changes to an Existing Degree (e.g. changing 15 or fewer hours, changing admission/graduation requirements, adding/changing Focused Study or Track)				
Are you adding a concentration?	No			
Are you adding a track?	No			
Are you adding a focused study?	No			
Effective Catalog Year	Fall 2020			
College/School Code	Graduate School and International Education (GRAD)			
Department Code	Department of Graduate Dean (GRSD)			
Program Code	SPACPH			
Degree	Doctor of Philosophy			
CIP Code	40.0203 - Planetary Astronomy and Science.			
Program Title	Space and Planetary Sciences, Doctor of Philosophy			
Program Delivery Method	On Campus			
Is this program interdisciplinary?				
No				

In Workflow

1. GRAD Dean Initial
2. GRAD Dean Initial
3. Director of Program Assessment and Review
4. Registrar Initial
5. Institutional Research
6. GRSD Chair
7. GRAD Dean
8. Global Campus
9. Provost Review
10. University Course and Program Committee
11. Graduate Committee
12. Faculty Senate
13. Provost Final
14. Provost's Office-- Notification of Approval
15. Registrar Final
16. Catalog Editor Final

Approval Path

1. 08/16/19 12:01 pm
Pat Koski (pkoski): Approved for GRAD Dean Initial
2. 08/16/19 12:02 pm
Pat Koski (pkoski): Approved for GRAD Dean Initial
3. 08/17/19 12:51 pm
Alice Griffin (agriffin): Rollback to GRAD Dean Initial for Director of Program Assessment and Review
4. 08/18/19 9:04 am
Pat Koski (pkoski):

Does this proposal impact any courses from another College/School?

No

What are the total hours needed to complete the program? 72

Program Requirements and Description

Requirements

- Approved for GRAD
Dean Initial
5. 08/18/19 9:05 am
Pat Koski (pkoski):
Approved for GRAD
Dean Initial
6. 08/30/19 4:39 pm
Alice Griffin
(agriffin): Approved
for Director of
Program
Assessment and
Review
7. 08/30/19 5:25 pm
Lisa Kulczak
(lkulcza): Approved
for Registrar Initial
8. 09/03/19 8:43 am
Gary Gunderman
(ggunderm):
Approved for
Institutional
Research
9. 09/03/19 10:28 am
Pat Koski (pkoski):
Approved for GRSD
Chair
10. 09/03/19 10:29 am
Pat Koski (pkoski):
Approved for GRAD
Dean
11. 09/04/19 4:44 pm
Suzanne Kenner
(skenner): Approved
for Global Campus
12. 09/05/19 8:39 am
Terry Martin
(tmartin): Approved
for Provost Review

History

1. Jun 10, 2015 by
Charlie Alison
(calison)
2. Aug 14, 2015 by Lisa
Kulczak (lkulcza)
3. May 15, 2017 by Pat
Koski (pkoski)

4. Nov 7, 2018 by Gina Daugherty (gdaughter)
 5. May 21, 2019 by Lisa Kulczak (lkulcza)

Requirements for the Doctor of Philosophy Degree: Students are required to take a minimum of 72 hours beyond the baccalaureate degree ~~or 42 to include a minimum 34~~ hours **beyond the master's degree to include a minimum 33 of required course work and 18** hours of **required course work and 18 hours of SPAC 700V**. Course requirements are given below.

Non-Core Courses

<u>SPAC 5211</u>	SPAC Proseminar	1
<u>SPAC 5123</u>	Internship	3

Core Courses

Select four of the following: 12

<u>SPAC 5033</u>	Astrophysics I: Stars and Planetary Systems
<u>SPAC 5313</u>	Planetary Atmospheres
<u>SPAC 5413</u>	Planetary Geology
<u>SPAC 5553</u>	Astrobiology
<u>SPAC 5613</u>	Astronautics

<u>SPAC 5161</u>	Seminar (must take every semester)	8
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Space and Planetary Electives

(see list below) – Must take at least three courses. Substitutions may be made with the approval of the committee. 9

~~Other Electives~~

Dissertation

<u>SPAC 700V</u>	Doctoral Dissertation	18
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Total Hours 51

Space and Planetary Electives

Note: Other courses may count as electives with the approval of the student’s research adviser and **committee**.

~~committee.~~

~~Planetary Astronomy~~

<u>ASTR 5043</u>	Astrophysics II: Galaxies and the Large-Scale Universe	3
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CHEM 5263	Nuclear Chemistry	3
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<u>ASTR 5073</u>	Cosmology	3
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<u>BIOL 5003L</u>	Laboratory in Prokaryote Biology	3
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<u>BIOL 5263</u>	Cell Physiology	3
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<u>BIOL 5233</u>	Genomics and Bioinformatics	3
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<u>BIOL 5353</u>	Ecological Genetics/genomics	3
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<u>BIOL 5463</u>	Physiological Ecology	3
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<u>CHEM 5253</u>	Spectrochemical Methods of Analysis	3
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<u>CHEM 5273</u>	Cosmochemistry	3
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<u>CHEM 5513</u>	Biochemical Evolution	3
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<u>CHEM 5813</u>	Biochemistry I	3
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<u>CHEM 5843</u>	Biochemistry II	3
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~~Astronautics and Orbital Mechanics~~

<u>CSCE 5043</u>	Advanced Artificial Intelligence	3
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MEEG 4233	Microprocessors in Mechanical Engineering I: Electromechanical Systems	3
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<u>ELEG 5243L</u>	Microelectronic Fabrication Techniques and Procedures	3
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<u>ELEG 5273</u>	Electronic Packaging	3
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<u>ELEG 5553</u>	Switch Mode Power Conversion	3
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ELEG 5903	Engineering Technical Writing	3
GEOS 5113	Global Change	3
<i>Origin and Evolution of Life</i>		
BIOL 4233	Genomics and Bioinformatics	3
BIOL 4263	Cell Physiology	3
BIOL 4353	Ecological Genetics/Genomics	3
GEOS 5253	Geomorphology	3
GEOS 5273	Principles of Geochemistry	3
GEOS 5293	Introduction to Global Positioning Systems and Global Navigation Satellite Systems	3
GEOS 5363	Climatology	3
GEOS 5563	Tectonics	3
GEOS 5653	GIS Analysis and Modeling	3
MEEG 5273	Electronic Packaging	3
MEEG 5403	Advanced Thermodynamics	3
MEEG 5423	Statistical Thermodynamics	3
MEEG 5833	Aerospace Propulsion	3
PHYS 5363	Scientific Computation and Numerical Methods	3
PHYS 5513	Atomic and Molecular Physics	3
<i>Planetary Geology</i>		
GEOS 5123	Stratigraphic Principles and Practice	3
GEOS 5423	Remote Sensing of Natural Resources	3
GEOS 560V	Graduate Special Problems	2-6
<i>Planetary Atmospheres</i>		
GEOS 5353	Meteorology	3
PHYS 5653	Subatomic Physics	3
SPAC 5033	Astrophysics I: Stars and Planetary Systems	3
SPAC 5313	Planetary Atmospheres	3
SPAC 5413	Planetary Geology	3
SPAC 5553	Astrobiology	3
SPAC 5613	Astronautics	3

No more than two 4000-level courses may be counted toward the Ph.D. degree. **Additional Requirements:** Students are required to complete a thesis or dissertation describing original research work in the space and planetary sciences that must be presented to and successfully defended before their committee. In addition, Ph.D. students must pass a candidacy examination.

The Ph.D. candidacy examination is administered by the **student's student's** committee and is designed to test the **student's student's** ability to assimilate, integrate and interpret material learned in the core required **courses while at the same time having a depth of understanding in the area of the student's research. Thus, the candidacy examination will be in two parts: (1) a 2500-word integrative essay on a theme chosen by the committee, and (2) an oral defense of the thesis before the committee.** ~~courses: While at the same time having a depth of understanding in the area of the student's research. Thus the candidacy examination will be in two parts: (1) a 2500-word integrative essay on a theme chosen by the committee, and (2) an oral defense of the thesis before the committee.~~ Part (1) will be assigned six weeks before the candidacy defense and shall be presented to the committee two weeks before that defense. The defense will be held at a date determined by the committee but usually before the end of the student's second year in graduate school. The committee will judge the examination as pass/fail and in the case of failure – and at the discretion of the committee – a second attempt to pass the qualifying examination is permitted within a period of time determined by the committee.

SPAC/ASTR 5033	Astrophysics I: Stars and Planetary Systems	3
SPAC/GEOS 5313	Planetary Atmospheres	3
SPAC 5413	Planetary Geology	3
SPAC/CHEM/BIOL 5513	Biochemical Evolution	3
SPAC 5613	Astronautics	3

Students should also be aware of Graduate School requirements with regard to [doctoral degrees](#).

Are Similar Programs available in the area?

No

Estimated Student Demand for Program NA

Scheduled Program **2025-2026** ~~NA~~

Review Date

Program Goals and Objectives

Program Goals and Objectives

- 1. To prepare graduates to successfully pursue careers in space and planetary sciences in academia, government and industry.
- 2. To prepare graduates to approach problems in space and planetary sciences from an interdisciplinary perspective.
- 3. To produce graduates who will become leaders in space and planetary sciences. ~~NA~~

Learning Outcomes

Learning Outcomes

- 1. Assimilate literature, refereed and unrefereed, to understand the state of previous work in a given area.
- 2. Design experiments to prove or disprove hypotheses.
- 3. To build and operate experimental equipment to be used in that assessment.
- 4. Understand the information that can be gained from common analytical equipment and instruments.
- 5. Defend the analysis of obtained data in a logical, detached manner.
- 6. Understand how an understanding of the universe and the exploration of space benefits society and use skills obtained from the program to promote this interaction. ~~NA~~

Description and justification of the request

Description of specific change	Justification for this change
<p>A program change was made previously without changing the total hours required. This change cleans that up.</p> <p>We also now provide a list of potential electives.</p> <p>We also cleaned up some catalog language.</p>	<p>Catalog accuracy; requirements easier for students to understand. Changes in program administration required changes in catalog language.</p>

Upload attachments

Reviewer Comments

Alice Griffin (agriffin) (08/17/19 12:51 pm): Rollback: Rolling back at request of submitter.

Alice Griffin (agriffin) (08/19/19 9:18 am): Inserted Program Goals and Student Learning Outcomes, plus the scheduled program review date.

Alice Griffin (agriffin) (08/30/19 4:39 pm): Deleted comment "Other Electives" and moved SPAC 5161 up to Core Courses with permission from submitter.

Lisa Kulczak (lkulcza) (08/30/19 5:24 pm): Adjusted submitter info for this proposal