CHANGING GRADUATION REQUIREMENTS IN A MAJOR

The addition or removal of any graduation requirement in a major requires that this form, accompanied by any supporting documentation, be completed and approved as indicated below.

College/School: College of Science and Liberal Arts

Department: Physics and Space Sciences

Degree level: Undergraduate

Program title: Space Sciences: Astronomy/Astrophysics

To be initiated with catalog year 2005/2006

APPROVALS

Upon completion of appropriate department approvals, submit form to Chair, Graduate Council, or Chair, Undergraduate Curriculum Committee for approval below and forward to Registrar's Office.

Originator: [Signature] 10/1/03

Date: Chair, Graduate Council

Department Head/Program Chair: [Signature] 10/1/03

Date: OR

Dean or Associate Dean: [Signature] 10/1/03

Date: Chair, Undergraduate Curriculum Committee

Registrar’s Use Only

Operator Init

Date

Distribution: Original – Registrar
Copy – Academic Unit/SOGS
TO: Dr. Richard Enstice, Vice President of Academic Affairs

FROM: Dr. Laszlo Baksay, Head, Professor, Physics and Space Sciences

DATE: August 27, 2003

SUBJECT: Changing Graduation Requirements in a Major
Program Title: Space Sciences/Astronomy and Astrophysics Option

The Department of Physics and Space Sciences requests a change in the Space Sciences/Astronomy and Astrophysics Option Program Degree Requirements for the 2005/2006 university catalog as follows:

Senior Year
Spring

Reinsert the following course:

SPS 4110 Senior Lab (2 credits)

Total Senior/Spring credits increase to (15) from 13.
Total Credits Required changes to (130) credits in place of 128.


Reason: SPS 4110 Senior Lab is a required course, which was accidentally omitted when the 2002-2003-catalog revision was published.
SPRING
COM 2223 Scientific and Technical Communication ........................................ 3
HUM 2051 Civilization .................................................. 3
MTH 2201 Differential Equations/Linear Algebra ........................................ 3
SPS 2010 Observational Astronomy .................................................. 3
   Free Elective .................................................................................. 3
Total 15

Junior Year
FALL
HUM 2052 Civilization .................................................. 3
MTH 3101 Complex Variables .................................................. 3
PHY 3111 Physical Mechanics .................................................. 3
PHY 3600 Thermodynamics, Kinetic Theory
   and Statistical Mechanics .................................................. 4
SPS 3010 Geophysics .................................................. 3
Total 17

SPRING
MTH 3201 Boundary Value Problems .................................................. 3
PHY 3535 Quantum Mechanics .................................................. 3
PHY 3460 Electromagnetic Theory .................................................. 3
SPS 3020 Methods and Instrumentation .................................................. 3
   Social Science Elective .................................................. 3
Total 16

Senior Year
FALL
MAE 3061 Fluid Mechanics .................................................. 3
   or
   OCE 3020 Fluid Mechanics .................................................. 3
   or
   PHY 4020 Optics .................................................. 3
   PHY 4021 Experiments in Optics .................................................. 3
   SPS 4100 Astrophysics .................................................. 3
   SPS 4200 Senior Seminar 2 .................................................. 3
   Technical Elective or Senior Research .................................................. 3
   Humanities Elective .................................................. 3
Total 17

SPRING
SPS 4200 Astrophysics .................................................. 3
   or
   SPS 4025 Introduction to Space Plasma Physics* .................................................. 3
   or
   SPS 4035 Comparative Planetary Science* .................................................. 3
   SPS 4210 Senior Seminar 2 .................................................. 3
   Technical Elective or Senior Research .................................................. 3
   Free Elective .................................................. 3
Total 15

*Courses taught on an alternate-year basis.

TOTAL CREDITS REQUIRED 80

Curriculum
The graduate program is a continuation of the space sciences undergraduate curriculum at Florida Tech. Students who have had a different undergraduate curriculum may have to take senior-level undergraduate courses to make up deficiencies. With the approval of the department, students may be given credit toward the master's degree for up to six semester credit hours of senior-level courses taken as a graduate student. Specialized space sciences senior-level courses commonly taken include astrophysics, planetary geophysics, and remote multispectral sensing.

The master of science degree is conferred after satisfactory completion of 35 credit hours of required and elective courses. Twenty-seven hours must be taken from the following core-course requirements:

Mathematics/Computer Science (2 courses)
MTH 5051 Applied Discrete Mathematics
MTH 5201 Math Methods in Science and Engineering 1
MTH 5202 Math Methods in Science and Engineering 2
MTH 5301 Numerical Analysis 1
MTH 5401 Applied Statistical Analysis
CSE 5001 Assembly Language and Organization
CSE 5100 Data Structure and Algorithms

Physics (3 courses)
PHY 5015 Analytical Mechanics 1
PHY 5030 Quantum Mechanics 1
PHY 5031 Quantum Mechanics 2
PHY 5081 Statistical Mechanics
EC 5410 Electrodynamics 1
EC 5411 Electrodynamics 2

Space Sciences (4 courses)
SPS 5010 Astrophysics 1: Stellar Structure and Evolution
SPS 5011 Astrophysics 2: Galactic Structure and Cosmology
SPS 5020 Space Physics 1: The Low-Energy Universe
SPS 5030 Planetary Science 1: Interiors
SPS 5031 Planetary Science 2: Atmospheres
SPS 5050 Astrodynamics

Courses taken during undergraduate years and applied to a bachelor's degree or equivalent may not be used to fulfill the core-course requirements. Substitutions may be made in special cases with the approval of the department head.

Electives can be selected with the advisor's approval from a wide variety of space science (SPS), space systems (SPC), physics (PHY), electrical and computer engineering (ECE), mechanical and aerospace engineering (MAE), and mathematics (MTH) offerings, including:
ECE 5350 Optical Electronics
ECE 5355 Optical Computing
ECE 5425 Antennas 1
ECE 5426 Antennas 2
PHY 5016 Analytical Mechanics 2
PHY 5020 Optics
PHY 5034 Semiconductor Physics
PHY 5035 Solid State Physics 1
PHY 5036 Solid State Physics 2
PHY 5054 Fourier Optics
PHY 5060 Thermodynamics
SPC 5004 Space Propulsion Systems
SPC 5005 Space Power Systems
SPC 5006 Space Communications and Data Systems
SPC 5017 Aerospace Remote Sensing Systems
SPC 5080 Space Missions

A thesis is optional and up to six semester hours of credit may be allowed for work leading to the thesis.
## Junior Year

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<tr>
<td>HUM 3052 Civilization 2</td>
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<tr>
<td>MTH 3101 Complex Variables</td>
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<td>PHY 3011 Physical Mechanics</td>
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<td>PHY 3015 Quantum Mechanics</td>
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<td>SPS 3010 Geophysics</td>
<td>3</td>
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<tr>
<td>MTH 3201 Boundary Value Problems</td>
<td>3</td>
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<td>PHY 3080 Thermodynamics, Kinetic Theory and Statistical Mechanics</td>
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<td>PHY 3440 Electromagnetic Theory</td>
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<td>SPS 3020 Methods and Instrumentation</td>
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<td>Social Science Elective</td>
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## Senior Year

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<td>MAE 2661 Fluid Mechanics</td>
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<td>PHY 4020 Optics</td>
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<tr>
<td>SPS 4030 Orbital Mechanics</td>
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<tr>
<td>SPS 4030 Astrophysics</td>
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<tr>
<td>SPS 4092 Undergraduate Research</td>
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<tr>
<td>or Technical Elective</td>
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## Spring

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<tr>
<td>15</td>
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**TOTAL CREDITS REQUIRED 130**

*Courses taught on an alternate-year basis.

## Master of Science Degree Program

The space sciences graduate program stresses astrophysics, the physics of the Earth and planets, astrodynamics, tracking technology and instrumentation, multispectral remote sensing, solar-terrestrial interrelations, near-Earth space environment, auroral and magnetospheric physics, terrestrial geomagnetism and stellar photometry. Graduate study in space sciences at the master's level prepares the graduate for a wide range of scientific and technical responsibilities in industry and government related directly or indirectly to the space program.

### Admission Requirements

An applicant for admission should have an undergraduate major in physics, mathematics, space science or an engineering field, and should submit Graduate Record Examination (GRE) scores from both the General Test and the Subject Test in Physics.

General admission requirements and the process of applying are presented in the Graduate Information and Regulations section of this catalog.

### Curriculum

The graduate program is a continuation of the space sciences undergraduate curriculum at Florida Tech; students who have had a different undergraduate curriculum may have to take senior-level undergraduate courses to make up deficiencies. With the approval of the department, students