Florida Tech

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	Date 10/17/03	Chair, Graduate Council	Date
Department Head/Program Chair	Date 10/17/03	**OR**	
Dean or Associate Dean	Date 10/16/03	Chair, Undergraduate Curriculum Committee	Date

Registrar's Use Only

Operator Init _____

Date _____

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Florida Tech

Department of Physics and Space Sciences
MEMORANDUM

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.

(See attached copy of 2003/2004 catalog, page 120 and 2001/2002 catalog, page 120.)

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 1 3
MTH	2201	Differential Equations/Linear Algebra 4
SPS	2010	Observational Astronomy 3
		Free Elective 3
		16

Junior Year

FALL CREDITS

HUM	2052	Civilization 2 3
MTH	3101	Complex Variables 3
PHY	3011	Physical Mechanics 4
PHY	3060	Thermodynamics, Kinetic Theory and Statistical Mechanics 4
SPS	3010	Geophysics 3
		17

SPRING

MTH	3201	Boundary Value Problems 3
PHY	3035	Quantum Mechanics 4
PHY	3440	Electromagnetic Theory 3
SPS	3020	Methods and Instrumentation 3
		Social Science Elective 3
		16

Senior Year

FALL CREDITS

MAE	3061	Fluid Mechanics 1 3
		or
OCE	3020	Fluid Mechanics 3
PHY	4020	Optics 3
PHY	4021	Experiments in Optics 1
SPS	4010	Astrophysics 1 3
SPS	4200	Senior Seminar 1 1
		Technical Elective or Senior Research 3
		Humanities Elective 3
		17

SPRING

SPS	4020	Astrophysics 2 3
SPS	4025	Introduction to Space Plasma Physics* 3
		or
SPS	4035	Comparative Planetology* 3
SPS	4210	Senior Seminar 2 1
		Technical Elective or Senior Research 3
		Free Elective 3
		13 15

add SPS 4110 Senior Lab

TOTAL CREDITS REQUIRED 128 130

**Courses taught on an alternate-year basis.*

Master of Science Degree Program

The space sciences graduate program stresses astrophysics, astrodynamics, space and planetary physics, cosmic ray physics, space instrumentation, physics of lightning, solar-terrestrial interrelations, 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 bachelor's degree 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 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 33 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
ECE 5410 Electrodynamics 1
ECE 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 adviser'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), computer science (CSE) and mathematics (MTH) offerings, including:
ECE 5350 Optical Electronics
ECE 5353 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 5080 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.

page copied from 2003-2004 Catalog

remove from Spring move to Junior yr. Fall

SPRING
COM 2223 Scientific and Technical Communication 3
PHY 3060 Thermodynamics, Kinetic Theory and Statistical Mechanics 4
PHY 3440 Electromagnetic Theory 3
SPS 3040 Fundamentals of Remote Sensing 3
SPS 4035 Comparative Planetology* 3
~~16~~ 15

Senior Year

FALL — CREDITS
MAE 3061 Fluid Mechanics 1 3
PHY 4020 Optics 3
PHY 4021 Experiments in Optics 1
SPS 3030 Orbital Mechanics ..... delete asterick only 3
SPS 4010 Astrophysics 1 3
SPS 4200 Senior Seminar 1 1
SPS 4902 Undergraduate Research 3
or Technical Elective 3
17

Interchange

SPRING
SPS 4025 Introduction to Space Plasma Physics* 3
or
SPS 4030 Physics of the Atmosphere ..... delete asterick only 3
SPS 4110 Senior Lab 2 2
SPS 4210 Senior Seminar 2 1
SPS 4902 Undergraduate Research 3
or Technical Elective 3
Social Science Elective 3
Free Elective 3
15

Interchange

TOTAL CREDITS REQUIRED 130

Courses taught on an alternate-year basis.

Astronomy and Astrophysics Option

The Astronomy and Astrophysics Option is designed to meet the needs of students intending to pursue graduate education and a career in the astronomical sciences.

Freshman Year

FALL — CREDITS
CHM 1101 Chemistry 1 4
COM 1101 Composition and Rhetoric 3
MTH 1001 Calculus 1 4
PHY 1050 Physics and Space Science Seminar 1
SPS 1010 Introduction to Astronomy 3
15

SPRING
CHM 1102 Chemistry 2 4
MTH 1002 Calculus 2 4
PHY 1001 Physics 1 4
PHY 2091 Physics Lab 1 1
SPS 1020 Introduction to Space Sciences 3
16

Sophomore Year

FALL — CREDITS
COM 1102 Writing about Literature 3
CSE 15xx Restricted Elective (Computer Science) 3
MTH 2001 Calculus 3 4
PHY 2002 Physics 2 4
PHY 2092 Physics Lab 2 1
SPS 2010 Observational Astronomy 3
18

Interchange

SPRING
COM 2223 Scientific and Technical Communication 3
HUM 2051 Civilization 1 3
MTH 2201 Differential Equations/Linear Algebra 4
PHY 2003 Modern Physics 1 3
Free Elective 3
16

Junior Year

FALL — CREDITS
HUM 2052 Civilization 2 3
MTH 3101 Complex Variables 3
PHY 3011 Physical Mechanics 4
PHY 3035 Quantum Mechanics 4
SPS 3010 Geophysics 3
17

SPRING
MTH 3201 Boundary Value Problems 3
PHY 3060 Thermodynamics, Kinetic Theory and Statistical Mechanics 4
PHY 3440 Electromagnetic Theory 3
SPS 3020 Methods and Instrumentation 3
Social Science Elective 3
16

Interchange

Senior Year

FALL — CREDITS
MAE 3061 Fluid Mechanics 1 3
PHY 4020 Optics 3
PHY 4021 Experiments in Optics 1
SPS 4010 Astrophysics 1 3
SPS 4200 Senior Seminar 1 1
SPS 4901 Undergraduate Research 3
or Technical Elective 3
Humanities Elective 3
17

Interchange

SPRING
SPS 4020 Astrophysics 2 3
SPS 4035 Comparative Planetology* 3
SPS 4110 Senior Laboratory 2 2
SPS 4210 Senior Seminar 2 1
SPS 4902 Undergraduate Research 3
or Technical Elective 3
Free Elective 3
15

Interchange

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.

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CURRICULUM

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2001-2002 catalog with revisions