

Submit originals and one copy and electronic copy to Governance/Faculty Senate Office (email electronic copy to fysenat@uaf.edu)

PROGRAM/DEGREE REQUIREMENT CHANGE (MAJOR/MINOR)

SUBMITTED BY:

Department	Physics	College/School	CNSM
Prepared by	Renate Wackerbauer	Phone	X6108
Email Contact	rawackerbauer@alaska.edu	Faculty Contact	Renate Wackerbauer

See <http://www.uaf.edu/uafgov/faculty/cd> for a complete description of the rules governing curriculum & course changes.

PROGRAM IDENTIFICATION:

DEGREE PROGRAM	MS Physics
Degree Level: (i.e., Certificate, A.A., A.A.S., B.A., B.S., M.A., M.S., Ph.D.)	MS

A. CHANGE IN DEGREE REQUIREMENTS: (Brief statement of program/degree changes and objectives)

MS Space Physics and MS Computational Physics are integrated into the MS Physics Program as concentrations (see below, justification for action);

B. CURRENT REQUIREMENTS AS IT APPEARS IN THE CATALOG:

Physics

College of Natural Science and Mathematics □ Department of Physics □ 907-474-7339 □ www.uaf.edu/physics/

B.A., B.S., M.S., M.A.T., PH.D. DEGREES

Downloadable PDF

Minimum Requirements for Degrees: M.S.: 30 - 33 credits; M.A.T.: 36 credits; Ph.D.: 18 thesis credits

The science of physics is concerned with the nature of matter and energy in all physical systems, from elementary particles to the structure and origin of the universe. Physics, together with mathematics and chemistry, provides the foundation for work in all fields of the physical sciences and engineering, and contributes greatly to other disciplines such as the biosciences and medicine.

Advanced study at the graduate level is offered in various areas of physics and applied physics, including many of the research specialties found at the UAF's Geophysical Institute. Faculty and student research programs currently emphasize investigations of auroral, ionospheric, magnetospheric and space plasma physics, the physics and chemistry of the upper and middle atmosphere, radio-wave propagation and scattering, solar-terrestrial relations, condensed matter physics, complex dynamics of non-linear systems, ice physics and infrasonics.

RECEIVED

SEP 24 2012

Dean's Office
College of Natural Science & Mathematics

Governance

10/3/12 TUP

Leah Berman

9/24/12 TUP

The physics department is also responsible for the graduate degree programs in general science, computational physics and space physics. These programs are also described in this catalog.

Graduate Program -- M.S. Degree

- A. Complete the general university requirements.
 - B. Complete the master's degree requirements.
 - C. Complete the thesis or non-thesis requirements: ☐ **Thesis**
 - D. Complete the following: ☐ PHYS F699--Thesis--6 - 12 credits
 - E. Complete four of the following: ☐ PHYS F611--Mathematical Physics I--3 credits ☐ PHYS F612--Mathematical Physics II--3 credits ☐ PHYS F621--Classical Mechanics--3 credits ☐ PHYS F622--Statistical Mechanics--3 credits ☐ PHYS F631--Electromagnetic Theory--3 credits ☐ PHYS F632--Electromagnetic Theory--3 credits ☐ PHYS F651--Quantum Mechanics--3 credits ☐ PHYS F652--Quantum Mechanics--3 credits
 - F. Complete 12 credits from the following: ☐ Approved PHYS F600-level courses ☐ Approved ATM F600-level courses
 - G. Minimum credits required--30 credits
 - H. ☐ **Non-Thesis**
 - I. Complete the following: ☐ PHYS F698--Research--3 - 6 credits ☐ Approved courses--18 credits
 - J. Complete four of the following: ☐ PHYS F611--Mathematical Physics I--3 credits ☐ PHYS F612--Mathematical Physics II--3 credits ☐ PHYS F621--Classical Mechanics--3 credits ☐ PHYS F622--Statistical Mechanics--3 credits ☐ PHYS F631--Electromagnetic Theory--3 credits ☐ PHYS F632--Electromagnetic Theory--3 credits ☐ PHYS F651--Quantum Mechanics--3 credits ☐ PHYS F652--Quantum Mechanics--3 credits
 - K. Minimum credits required*--33 credits
- * At least 30 credits must be regular course work.*

Graduate Program -- M.A.T. Degree

- A. Complete the general university requirements.
- B. Complete the M.A.T. degree requirements.
- C. Contact the department head for specific degree requirements.
- D. Minimum credits required--36 credits

Graduate Program -- Ph.D. Degree

- A. Complete the general university requirements.
 - B. Complete the Ph.D. degree requirements.*
 - C. Complete and pass a written and oral comprehensive examination.
 - D. Minimum credits required--18 credits
- * Complete in accordance with physics department's policies and procedures manual for graduate students.*

See General Science.

See Physics, Computational.

See Physics, Space.

C. PROPOSED REQUIREMENTS AS IT WILL APPEAR IN THE CATALOG WITH THESE CHANGES:
(Underline new wording ~~strike through old wording~~ and use complete catalog format)

Since MS computational physics and MS space physics are integrated into MS physics program, the proposed requirements cannot be expressed by underlining new wording or striking old words. Thus the proposed requirements are listed below

Physics

College of Natural Science and Mathematics
Department of Physics
907-474-7339
www.uaf.edu/physics/

B.A., B.S., M.S., M.A.T., Ph.D. DEGREES

Downloadable PDF

Minimum Requirements for Degrees: M.S.: 30 - 33 credits; M.A.T.: 36 credits; Ph.D.: 18 thesis credits

~~The science of physics is concerned with the nature of matter and energy in all physical systems, from elementary particles to the structure and origin of the universe. Physics, together with mathematics and chemistry, provides the foundation for work in all fields of the physical sciences and engineering, and contributes greatly to other disciplines such as the biosciences and medicine.~~

Advanced study at the graduate level is offered in various areas of physics and applied physics, including many of the research specialties found at the UAF's Geophysical Institute. Faculty and student research programs currently emphasize space physics, infrasonics, complex dynamics of nonlinear systems, ice physics, and condensed matter physics.

The MS degree with Computational Physics option provides expertise in advanced computing environments, in the relevant mathematical foundations and in the specific physics discipline. It is directed toward students with undergraduate academic backgrounds in physics or other closely associated fields, such as engineering, that have the appropriate physics course work. This degree is relevant for students seeking careers in any areas that require expertise in computational modeling and simulation of physical systems.

The MS degree with Space Physics option focuses on the physics of upper atmospheres, ionospheres, magnetospheres and the interplanetary medium. It includes core physics courses and specialty courses in space physics, aeronomy, magnetospheric and auroral physics, and advanced plasma physics. The specialty courses support graduate research with faculty members at UAF's Geophysical Institute, and include areas such as numerical simulations and time-series analysis. Additional courses such as radiative transfer and physics of fluids provide added breadth.

Graduate Program -- M.S. Degree

1. Complete the general university requirements.
2. Complete the master's degree requirements.

3. Complete four of the following: ~~Complete the thesis or non-thesis requirements:~~

PHYS F611--Mathematical Physics I--3 credits
PHYS F612--Mathematical Physics II--3 credits
PHYS F621--Classical Mechanics--3 credits
PHYS F622--Statistical Mechanics--3 credits
PHYS F631--Electromagnetic Theory I--3 credits
PHYS F632--Electromagnetic Theory II--3 credits
PHYS F651--Quantum Mechanics I--3 credits
PHYS F652--Quantum Mechanics II--3 credits

4. Complete the thesis or non-thesis requirements:

Thesis

1. Complete the following:
PHYS F699--Thesis--6 - 12 credits
2. Complete four of the following:
PHYS F611--Mathematical Physics I--3 credits
PHYS F612--Mathematical Physics II--3 credits
PHYS F621--Classical Mechanics--3 credits
PHYS F622--Statistical Mechanics--3 credits
PHYS F631--Electromagnetic Theory I--3 credits
PHYS F632--Electromagnetic Theory II--3 credits
PHYS F651--Quantum Mechanics I--3 credits
PHYS F652--Quantum Mechanics II--3 credits
- 2.3. Complete 12 credits from the following:
Approved PHYS F600-level courses
Approved ATM F600-level courses
3. 4. Minimum credits required--30 credits

Non-Thesis

1. Complete the following:
PHYS F698--Research--3 - 6 credits
Approved courses--18 credits
2. Complete four of the following:
PHYS F611--Mathematical Physics I--3 credits
PHYS F612--Mathematical Physics II--3 credits
PHYS F621--Classical Mechanics--3 credits
PHYS F622--Statistical Mechanics--3 credits
PHYS F631--Electromagnetic Theory I--3 credits
PHYS F632--Electromagnetic Theory II--3 credits
PHYS F651--Quantum Mechanics I--3 credits
PHYS F652--Quantum Mechanics II--3 credits
- 2.3. Minimum credits required*--33 credits

* At least 30 credits must be from regular course work for non-thesis

option.

Graduate Program -- M.S. Degree with Computational Physics Option

1. Complete the general university requirements.
2. Complete the master's degree requirements.
3. Complete the following:
 - PHYS F611--Mathematical Physics I--3 credits
 - PHYS F612--Mathematical Physics II--3 credits
 - PHYS F629--Methods of Numerical Simulation in Fluids and Plasma--3 credits
4. Complete at least 3 credits from the following:
 - Approved MATH F600-level courses (excluding MATH/PHYS F611 and F612)--3 credits
 - Approved CS F600-level courses--3 credits
5. Complete the thesis or non-thesis requirements:

Thesis

1. Complete the following:
 - PHYS F699--Thesis--6 - 12 credits
2. Complete approved PHYS F600-level courses --6cr
3. Minimum credits required--30 credits
 - * At least 24 credits must be from regular course work for non-thesis

option.

Non-Thesis

1. Complete the following
 - PHYS F698--Research--3 - 6 credits
2. Complete approved PHYS F600-level courses--9 credits
3. Minimum credits required*--33 credits
 - * At least 30 credits must be from regular course work for non-thesis

option.

Graduate Program -- M.S. Degree with Space Physics Option

1. Complete the general university requirements.
2. Complete the master's degree requirements.
3. Complete four of the following:
 - PHYS F626--Fundamentals of Plasma Physics--3 credits
 - PHYS F627--Advanced Plasma Physics--3 credits
 - PHYS F629--Methods of Numerical Simulation in Fluids and Plasma--3 credits
 - PHYS F672--Magnetospheric Physics--3 credits
 - PHYS F673--Space Physics--3 credits
4. Complete the thesis or non-thesis requirements:

Thesis

1. Complete the following:
 - PHYS F699--Thesis--6 - 12 credits
 - Approved PHYS F600-level courses--12 credits

2. Minimum credits required--30 - 33 credits

Non-Thesis

1. Complete the following:
PHYS F698--Research--3 - 6 credits
Approved PHYS F600-level courses--18 credits
2. Minimum credits required--30 - 33 credits

Graduate Program -- M.A.T. Degree

1. Complete the general university requirements.
2. Complete the M.A.T. degree requirements.
3. Contact the department head for specific degree requirements.
4. Minimum credits required--36 credits

Graduate Program -- Ph.D. Degree

1. Complete the general university requirements.
2. Complete the Ph.D. degree requirements.*
3. Complete and pass a written and oral comprehensive examination.
4. Minimum credits required--18 credits

** Complete in accordance with physics department's policies and procedures manual for graduate students.*

D. ESTIMATED IMPACT

WHAT IMPACT, IF ANY, WILL THIS HAVE ON BUDGET, FACILITIES/SPACE, FACULTY, ETC.

no impact on budget, facilities and faculty since program existed before, and all physics courses are continued to be taught.

E. IMPACTS ON PROGRAMS/DEPTS:

What programs/departments will be affected by this proposed action?
Include information on the Programs/Departments contacted (e.g., email, memo)

None. It is a program change within Physics Department

F. IF MAJOR CHANGE - ASSESSMENT OF THE PROGRAM:

Description of the student learning outcomes assessment process.)

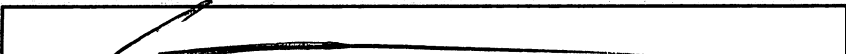
No major change

JUSTIFICATION FOR ACTION REQUESTED

The purpose of the department and campus-wide curriculum committees is to scrutinize program/degree change applications to make sure that the quality of UAF education is not lowered as a result of the proposed change. Please address this in your response. This section needs to be self-explanatory. If you drop a course, is it because the material is covered elsewhere? Use as much space as needed to fully justify the proposed change and explain what has been done to ensure that the quality of the program is not compromised as a result.

The Physics Department was required by the Provost to reduce the number of offered graduate degrees. MS in Space Physics and MS in Computational Physics were terminated by the Provost. The Physics Department is integrating these degrees into the MS Physics Program in form of concentrations, since they are the reason for some of our incoming graduate students to come to UAF, and since they are competitive degrees within the physics degrees worldwide.

APPROVALS:

 Date **20 SEP 2012**


Signature, Chair,
Program/Department of:

**Curt Szuberla
Physics**

 Date **9/26/2012**

Signature, Chair, College/School Curriculum
Council for:

CN SM

 Date **10/1/12**

Signature, Dean, College/School
of:

**Paul Loyer
College of Natural Science & Mathematics**

ALL SIGNATURES MUST BE OBTAINED PRIOR TO SUBMISSION TO THE GOVERNANCE OFFICE

 Date 

Signature, Chair, UAF Faculty Senate Curriculum
Review Committee