Program Change Request

Date Submitted: 02/10/23 12:21 pm

Viewing: SC-PHD-PHYS : Physics, PhD

Last approved: 02/23/21 4:58 pm

Last edit: 02/10/23 12:21 pm

Changes proposed by: jbazaz

Catalog Pages Using this Program

Physics, PhD

No Longer Anticipated closure Rationale for

Are you completing this form on someone else's behalf?

Yes

Requestor:

Name	Extension	Email
Ernest Barreto	4431	ebarreto

Effective Catalog:

In Workflow

1. **PHYS GR Committee**
2. **PHYS Chair**
3. **SC Curriculum Committee**
4. SC Associate Dean
5. Assoc Provost-Graduate
6. Registrar-Programs

Approval Path

1. 02/10/23 12:49 pm Ernest Barreto (ebarreto): Approved for PHYS GR Committee
2. 02/10/23 12:52 pm Paul So (paso): Approved for PHYS Chair

History

1. Nov 14, 2017 by clmig-jwehrheim
2. Jan 11, 2018 by rzachari
3. Feb 16, 2018 by rzachari
4. Feb 23, 2021 by jriemen

2023-2024

Program Level: Graduate

Program Type: Doctoral

Degree Type: Doctor of Philosophy

Title: Physics, PhD

1. What was the process used t
2. What evidence was used to id
3. Have you ensured there are no
b. Has CPE confirmed the proposed
c. Has the instructor(s) for this badg
f. Does this badge provide a benefit fo
5. Is this badge co-sponsored with anot
a. What is the organization, program, or

Badge:
Participant:
Document:
Portfolio:
Presentation:
Assessment:
Credential:
Education
Other:
Project:
Professional
Schedule/Registration:
Volunteer:

Skills Tag

Skills Tag

Badge Attributes

Please select one from each category.
Achievement Type:
Mastery Level:
Time Commitment:
Cost:
Industry Standards:
Recommendations:

Issuance information and Pricing

Pricing: See https://cpe.gmu.edu/digitalbadgepricing/ for more information

Estimated Number of Badges Expected to be Issued:

Notes:

- A Mason Digital Credentials Advisory Group may be developed to

Banner Title: **Physics, PhD**

Is this a retitling of an existing

Existing Program

Registrar/OAPI Use Only – SCHEV Status Approved

Registrar's Office Use Only – Program Start Term

Registrar/OAPI Use Only – SCHEV Letter

Registrar/OAPI Use Only – SACSCOC Status

Concentration(s):

	Associated Concentrations	Registrar's Office Use Only: Concentration Code
1	Standard	STND
2	Engineering Physics	ENGP

INTO Major(s):

Registrar/IRR Use Only – Concentration CIP Code

College/School: College of Science

Department / Academic Unit: Physics & Astronomy

Jointly Owned Program? No

Participating

Participating

Justification

What: We are changing the wording regarding GRE and GRE subject test in physics in our application requirements.

Why: Our faculty voted to explicitly not require the GRE subject test in physics of applicants to our graduate programs.

Catalog Published Information

Total Credits Required: Total credits: 72

Registrar's Office Use Only - Program Code:

SC-PHD-PHYS

Registrar/IRR Use Only – Program CIP Code

Admission Requirements:

Admissions

University-wide admissions policies can be found in the Graduate Admissions Policies section of this catalog.
To apply for this program, please complete the George Mason University Admissions Application.
Those holding a baccalaureate degree in physics, astronomy, or engineering from an institution of higher education accredited by a Mason-recognized U.S. institutional accrediting agency or international **equivalent who** ~~equivalent who~~ earned a GPA of 3.00 (out of 4.00) or higher in their last 60 credits ~~and have received acceptable scores on the GRE-GEN~~ are invited to apply for admission.
~~Three letters of recommendation must be submitted, preferably from formerprofessors.The GRE subject test in physics is highly recommended for all interested applicants in the standard concentration who received their baccalaureate degrees within the past fiveyears.~~The **GRE-GEN is required; however, this** ~~GRE~~ requirement **is** ~~can be~~ waived if the student has received a master's degree from **an institution of higher education** ~~a regionally~~ accredited **by a Mason-recognized** U.S. **institutional accrediting agency or international equivalent. The GRE subject test in physics is not required.**
Three letters of recommendation must be submitted, preferably from former professors.
~~institution.~~A degree-seeking graduate applicant with a baccalaureate degree who has not met all admission requirements may be offered provisional admission if sufficient evidence is presented to suggest that the applicant has the ability to pursue graduate work.
For more details concerning admission requirements to George Mason University please refer to Graduate Admission Policies.

Program-Specific Policies:

Policies

For policies governing all graduate programs, see AP.6 Graduate Policies.

Reduction of Credits

For students entering the doctoral program with a master's degree in a related field from an institution of higher education accredited by a Mason-recognized U.S. institutional accrediting agency or international equivalent, the number of required credits may be reduced up to 30 credits, subject to approval of the program faculty and the college's associate dean. See AP.6.5.2 Reduction of Credits for more information.

Degree Requirements:

Students should refer to the Admissions & Policies tab for specific policies related to this program.
Students must first choose one concentration, then continue with the additional sections:

Standard Concentration (STND)

Core Courses		12
PHYS 684	Quantum Mechanics I	
PHYS 685	Classical Electrodynamics I	
PHYS 705	Classical Mechanics	
PHYS 711	Statistical Mechanics	
Specialty Science Courses [1]		6
Select two of the following courses:		
ASTR 680	Physics of Interstellar Media	
ASTR 730	Stellar Astrophysics	
PHYS 784	Quantum Mechanics II	
PHYS 785	Classical Electrodynamics II	
Seminar Course		3
PHYS 703	Seminar in Physics (must be taken three times)	
Total Credits		21

Engineering Physics Concentration (ENGP)

Core Courses		12
PHYS 510	Computational Physics I	
PHYS 613	Computational Physics II	
PHYS 620	Continuum Mechanics	
PHYS 690	Engineering Thermodynamics	
Specialty Science Courses [1]		6
Select two of the following courses:		
PHYS 640	Finite Element Analysis of Solids and Fluids	
PHYS 694	Applied Mechanics of Solids	
PHYS 695	Applied Fluid Mechanics	
PHYS 684	Quantum Mechanics I	
PHYS 685	Classical Electrodynamics I	
Seminar Courses		3
PHYS 703	Seminar in Physics (at least one credit required)	
And any other graduate-level PHYS/CEIE/MECH/MATH/CSI seminar		
Total Credits		21

1 These electives must be approved by the student's advisor or the graduate coordinator.

General Science Electives

Students in both the Standard Concentration and Engineering Physics Concentration must complete 27 credits of approved general electives and preliminary research credits: 2		27
ASTR 796	Directed Reading and Research	

ASTR 798	Research Project	
PHYS 796	Directed Reading and Research	
PHYS 798	Research Project	
Any graduate-level course chosen from PHYS/ASTR courses		3
Total Credits		27

2PHYS 796 Directed Reading and Research/ASTR 796 Directed Reading and Research may be repeated as needed.

3General elective courses may be chosen from PHYS/ASTR courses, and/or other related disciplines as approved by the student's advisor or dissertation committee.

Qualifying Examination

All students must successfully pass the four individual sections required for each concentration of a qualifying examination. For the Standard Concentration, the four topics on the qualifying exam are covered in the four core courses (PHYS 684 Quantum Mechanics I, PHYS 685 Classical Electrodynamics I, PHYS 705 Classical Mechanics, and PHYS 711 Statistical Mechanics). For the Engineering Physics Concentration, the four topics on the qualifying exam are covered in the four core courses (PHYS 690 Engineering Thermodynamics or PHYS 711 Statistical Mechanics, PHYS 620 Continuum Mechanics or PHYS 705 Classical Mechanics, PHYS 510 Computational Physics I and PHYS 613 Computational Physics II) and in one of the specialty science courses (PHYS 694 Applied Mechanics of Solids or PHYS 695 Applied Fluid Mechanics).

All four sections of the qualifying exam will be offered twice a year, typically in the week before the start of the fall and spring semesters. A student can choose to take a particular section or a combination of sections at one sitting. Grades of “pass” or “unsatisfactory” will be given individually for each of the four sections of the exam. If a student receives a grade of “unsatisfactory” in a given section of the exam, he/she is allowed to retake that section in the next cycle, but a student must satisfactorily pass all sections of the exam by the end of the third year from the date of enrollment in the PhD program. Students entering the program with equivalent courses taken at another institution can satisfy a core course requirement by taking the associated qualifying exam without taking the course. At the beginning of each academic year, the program director will appoint members to the qualifying examination committee. This committee is responsible for creating, administering, and grading the qualifying exams offered that year. Additional information and previous qualifying exams can be found on the departmental web page.

Dissertation Committee and Program of Study

Upon successful completion of the qualifying examinations, a dissertation committee should be formed by the student as soon as possible. The chair of this committee must be a graduate faculty member from the Department of Physics and Astronomy. The committee must include at least two additional members from the graduate faculty, one of whom must be from outside the Department of Physics and Astronomy. The composition of the committee must be approved by the program director. The dissertation committee is responsible for directing the student in their chosen field of research. The student should work closely with their committee to select specialty courses and electives that form a cohesive program of study. The student's program of study must be approved by the dean before advancement to candidacy.

Advancement to Candidacy

Before a student may be advanced to doctoral candidacy, he/she needs to complete all required coursework, pass the qualifying examination, have the program of study and dissertation proposal approved by the dean, and be recommended by the dissertation committee. Advancement to doctoral candidacy implies that the student has demonstrated adequate breadth and depth of knowledge in the field of study and is capable of conducting research on the boundaries of knowledge.

Dissertation Research

Note: No more than 24 combined credits from PHYS 998 Doctoral Dissertation Proposal/ASTR 998 Doctoral Dissertation Proposal and PHYS 999 Doctoral Dissertation/ASTR 999 Doctoral Dissertation may be applied toward satisfying the doctoral degree requirements, with no more than 21 credits of PHYS 998 Doctoral Dissertation Proposal/ASTR 998 Doctoral Dissertation Proposal.

Select 24 credits from the following:		24
ASTR 998	Doctoral Dissertation Proposal	
ASTR 999	Doctoral Dissertation	
PHYS 998	Doctoral Dissertation Proposal	
PHYS 999	Doctoral Dissertation	
Total Credits		24

Doctoral Dissertation

After advancing to doctoral candidacy, the student works with their dissertation committee to develop their preliminary research into a doctoral dissertation. The dissertation research should represent a significant contribution to its scientific field and should be deemed publishable in a refereed scientific journal. The dissertation must be defended in a public forum before the dissertation committee and other interested faculty.

Retroactive Requirements Updates:

Plan of Study:

Honors Information:

Accelerated Description/Dual

Degree Description:

INTO-Mason Requirements:

College Requirements & Policies:

Department / Academic Unit Requirements & Policies:

Program Outcomes

Additional Program Information

This information is required by the Office of Accreditation and Program Integrity.

Courses offered via distance (if applicable):

Indicate whether students are able

What is the primary delivery format for the program? Face-to-Face Only

Does any portion of this program occur off-campus?

No

Off-campus details:

Are you working with a vendor / other collaborators to offer your program?

No

Please explain:

Related Departments

Could this program prepare students for any type of professional licensure, in Virginia or elsewhere?

No

Please explain:

Are you adding or removing a licensure component?

No

Please explain:

Additional SCHEV & SACSCOC Information

Is the content of the new program closely related to that of an existing approved program at the same instructional level (i.e., baccalaureate, master's, doctoral)?

Which existing approved program(s)?

Is this new program considered to be "advancing the degree level of a currently approved program" (i.e. existing content is at lower degree level, new content is at the

Which existing approved program(s)?

Is this new program considered to be "lowering the degree level of a currently approved program" (i.e. existing content is at higher degree level, new content is at the lower degre

Which existing approved program(s)?

Is this a re-opening of a program that was closed to admission within the last five years?

Date of Program Closure

What are the methods of delivery for the program?

Does this program include a course/credit-based competency-based education delivery option?

Is this change a simple retitling of an existing program, with no other changes, to any existing program content, curriculum requirements, etc?

No

Does this change represent a repackaging of content in an existing approved degree/certificate program at the same instructional level (i.e., baccalaureate, master's, or doctoral)?

No

Which existing approved program(s)?

Percentage of total credits containing new course content. ("New course content" is defined by SACSCOC as content that is not currently included in an existing approved degree/certificate program at the same instructiona level. Do not exclude gen ed credits in calculations for undergraduate programs.)

0%-24%

Does this change include the addition of a distance education or face-to-face method of delivery for this program?

No

What is the new method of delivery?

Does this change include the addition of a course/credit-based competency-based education delivery option?

No

Will any additional equipment/facilities be needed?

No

Description of institutional impact:

Will any additional faculty be required?

No

Description of institutional impact:

Will any additional financial resources be needed?

No

Description of institutional impact:

Additional library/learning resources needed?

No

Description of institutional impact:

OAPI Use Only – Determination of SACSCOC Impact

Comments or Notes

Green Leaf Program Designation

Is this a Green Leaf program? No

Green Leaf

Sustainability-focused academic programs require at least one green leaf course. Either that course is itself sustainability-focused or else the program requires a set of sustainability-related courses with aggregated

Relationship to

Relationship to

List sustainability-focused courses currently required in the degree

Sustainability-related academic programs either require at least one sustainability-related

List sustainability-related courses currently required in the degree

Does this program cover material which crosses into another department?

No

Impacted

Additional Attachments physics phd.pdf

SCHEV Proposal

Executive Summary

Reviewer Comments

Additional Comments

Is this course required of all students in this degree program?

%wi_required.eschtml%

Attached Document

Key: 348