FLORIDA ATLANTIC UNIVERSITY

NEW/CHANGE PROGRAM REQUEST
Graduate Programs

UGPC Approval _____
UFS Approval _____
Banner _____
Catalog _____

Department Physics

College Science

Program Name
Ph.D. in Physics

☐ **New Program***

☑ **Change Program***

Effective Date
(TERM & YEAR)
Summer 2023

Please explain the requested change(s) and offer rationale below or on an attachment.

The following proposed changes will reduce the Physics Ph.D. program from 80 to 72 credits overall:

* Eliminate the requirement of a recent GRE subject area score. Students are encouraged to submit a score if they have one since it can help in admissions decisions. But it will no longer be required.
* Update the required TOEFL exam scores for international students to include all three tests currently offered.
* Introduce Computational Physics (PHZ 5156, 3 credits) as a required course to reflect the increasing importance of simulation and data analysis methods in the field.
* Eliminate Electromagnetic Fields (PHY 6347, 3 credits) and Quantum Mechanics 2 (PHY 6646, 3 credits) as required courses. Both with still be offered periodically as electives.
* Eliminate Graduate Colloquium (PHY 6920, 2 x 1 credit) as a required course. Students must attend anyway.
* Reduce the required elective credits from 27 (15 for the non-thesis M.S. plus 12 additional for the Ph.D.) to 24.
* Allow students to take new Directed Independent Study (AST/PHY/RAT 6907) courses for up to 6 elective credits. Scheduling limitations can prevent the Department offering suitable electives in a timely manner.
* Allow students to substitute pre-candidacy research courses for up to 6 credits of Dissertation so that they can start their research programs as early as possible.
* Overhaul the candidacy requirements to eliminate our Candidacy Exam, which forced students to study material already covered in our first-year courses, and prioritize the transition to research instead.
* Introduce new post-Candidacy stipulations regarding the structure of supervisory committees, and new annual reporting requirements aimed at encouraging timely graduation.

*All new programs and changes to existing programs must be accompanied by a catalog entry showing the new or proposed changes.

Faculty Contact/Email/Phone
Chris Beetle <cbeetle@fau.edu> 7-4612

Consult and list departments that may be affected by the change(s) and attach documentation
none

Approved by	***Date***
Department Chair	3/1/2023
College Curriculum Chair Louis Merlin	03/14/2023
College Dean Mihaela Cardei	03/15/2023
UGPC Chair Mihaela Cardei (Mar 29, 2023 17:02 EDT)	Mar 29, 2023
UGC Chair	Mar 29, 2023
Graduate College Dean William David Kalies	Mar 29, 2023
UFS President	
Provost	

Email this form and attachments to UGPC@fau.edu 10 days before the UGPC meeting.

Physics

Doctor of Philosophy (Ph.D.)

The Department of Physics offers graduate study leading to a Doctor of Philosophy (Ph.D.) degree. The department is active in research in experimental, theoretical, ~~or~~ and computational physics, as well as astronomy. The Ph.D. will be conferred only for work of distinction in which the student displays original scholarship, achievement, and ability.

Admission Requirements

~~Admission requirements for the Ph.D. in Physics are the same as for the M.S. in Physics.~~

In addition to meeting all of the University and College admission requirements for graduate study, applicants for the Ph.D. in Physics must meet all of the following the departmental requirements:

1. Hold a B.S. degree, or equivalent, in Physics or a closely related field;
2. Earn a GPA of 3.0 or higher, or equivalent, in the last 60 credits of undergraduate work;
3. Be approved by the Department of Physics; and
4. Pass a recent TOEFL exam with a minimum score of 550(PBT), 213(CBT), or 79(IBT). This requirement is waived for students from countries whose official languages include English.

In addition, the Department strongly encourages applicants to secure two or more letters of support from faculty familiar with their past work, and to provide a report of a recent score on the GRE Physics subject exam. Although not required, these items will be considered in the admissions process if available.

Degree Requirements *(minimum of ~~80~~ 72 credits)*

1. ~~Candidates~~ Students in ~~for~~ the Physics Ph.D. ~~in Physics~~program must satisfy ~~all course and degree requirements for the M.S. in Physics as well as the following additional~~the following course requirements:~~.~~

~~Additional Ph.D.~~ Graduate Core C~~c~~ourses - ~~50~~ 12 credits required		
Mechanics	PHY 6247	3
Electromagnetism	PHY 6346	3
Statistical Mechanics	PHY 6536	3
Quantum Mechanics 1	PHY 6645	3
Mathematical Physics Course - 3 credits required		
Mathematical Physics 1	PHZ 5115	3 **or**
Mathematical Physics 2	PHZ 5116	3
Computational Physics Course - 3 credits required		
Computational Physics	PHZ 5156	3
Ph.D. Elective and Research Courses – 54 credits required		
~~Electromagnetic Fields~~	~~PHY 6347~~	~~3~~
~~Quantum Mechanics 2~~	~~PHY 6646~~	~~3~~
~~Graduate Colloquium *(taken twice)*~~	~~PHY 6920~~	~~2~~
~~Additional a~~Approved ~~e~~Electives *~~, **~~		~~12~~24
Dissertation**	PHY 7980	30

* All electives must be approved by the ~~d~~Department's ~~g~~Graduate ~~a~~Advisor. At most 6 elective credits may be earned in Directed Independent Study (AST/PHY/RAT 6907) courses offered by Department faculty. ~~All 12 elective credits counted toward the Ph.D. in Physics degree must be earned in Physics courses at the 6000 level or above.~~
** Up to 6 credits of other graduate-level research courses offered by the Department may be counted toward the Dissertation requirement.~~No additional credits of Graduate Research (PHY 6918), beyond the maximum 3 allowed in the M.S. in Physics program, may be counted toward this degree.~~

2. The D~~d~~epartment may apply up to ~~30~~ 24 transfer credits from another institution toward this degree. Approval of transfer credits is at the discretion of the ~~department graduate advisor~~Department Faculty. However, all students in the Ph.D. program must complete the Ph.D. Core Courses listed above at FAU.

Admission to Candidacy

To be admitted to candidacy, students must satisfy the following requirements within five semesters (excluding Summers) of beginning the Ph.D. program:

1. Complete the four Graduate Core Courses listed above with a grade of B or higher in each.
2. Complete at least 36 credits of graduate-level courses (including the Graduate Core Courses and approved transfer credits from other institutions, but excluding Research or Dissertation credits) with a cumulative GPA of at least 3.0.
3. Form a Supervisory Committee:
    a. Identify a member of the Department faculty who agrees to serve as Ph.D. Supervisor and Chair (or co-chair) of the Supervisory Committee overseeing a Dissertation project on a specific topic selected by the student in consultation with the Supervisor.
    b. Identify at least three additional members of the FAU Graduate Faculty who agree to serve as members of the Supervisory Committee. At least one member of the Supervisory Committee must be from outside the FAU Department of Physics, but a (simple) majority of Committee members must be Graduate Faculty from within the Department.
    c. Submit all required paperwork to FAU's Graduate College to form the Supervisory Committee and finalize the student's Plan of Study.
    d. Membership of the Supervisory Committee and the revised Plan of Study (if any) must be approved by the Department's Graduate Advisor.
4. Present a general outline of the proposed Dissertation project at a Physics Colloquium.
5. Pass a Comprehensive Oral Exam administered by the Supervisory Committee. The exam will cover topics from graduate-level coursework that the Committee considers relevant to the student's proposed research.

~~Students must demonstrate mastery of the broad areas of physics covered in the undergraduate and first-year graduate programs before being admitted to candidacy for the Ph.D. in Physics. This mastery will be tested by means of a series of written Qualifying Exams on the following four subjects: Classical Mechanics, Electromagnetism, Quantum Mechanics and Statistical Mechanics. Qualifying Exams are usually scheduled at the end of the summer term and the beginning of the fall term and must be taken after the first year of study in the Ph.D. in Physics program. The Qualifying Exam in each subject area will be waived for students who receive a grade of "A" or "A-" in the corresponding first-year graduate course at FAU: Mechanics (PHY 6247), Electromagnetism (PHY 6346), Quantum Mechanics 1 (PHY 6645) and Statistical Mechanics (PHY 6536).~~

~~Dissertation Advisor and a Supervisory Committee~~

~~Students are expected to form a Supervisory Committee for their Ph.D. research program as soon as possible after being admitted to candidacy, no later than the end of the second year of graduate study. The Supervisory Committee must be either chaired or co-chaired by a member of the graduate faculty in the Department of Physics. It must include at least four members in total, the majority of whom must be members of the department's graduate faculty. The composition of the Supervisory Committee should be decided in consultation with the committee chair (and co-chair, if applicable) and must be approved by the department's graduate advisor. Once approved, the Supervisory Committee shall meet with the student to approve his or her plan of study and dissertation topic.~~

Doctoral Research

Ph.D. Candidates in Physics are expected to demonstrate consistent progress toward timely graduation, typically within six years of entering the Ph.D. program. Accordingly, each Candidate shall organize a meeting at least once per year with their Supervisory Committee. The Candidate shall prepare a one-page, written report describing progress in their Dissertation research project since the Supervisory Committee last met, which shall be sent to the Committee members and the Department's Graduate Advisor at least one week prior to the Committee meeting.

Candidates must complete a significant program of original research, ~~a directed independent study in general theory and~~ participate in advanced seminars in their areas of specialization, and defend completed ~~culminating in a d~~Dissertations in the Physics Department Colloquium series ~~and a final oral examination~~. ~~The~~ Each ~~d~~Dissertation must be clearly written, complete, and demonstrate an original contribution ~~add~~ to the sum of existing knowledge ~~and be expressed with literary skill and clarity~~. ~~The~~ Each completed D~~d~~issertation must be approved by the ~~student's~~ Candidate's S~~s~~upervisory C~~c~~ommittee, the D~~d~~epartment C~~c~~hair, and the ~~dean~~ Deans of the Charles E. Schmidt College of Science and of the Graduate College.