

**University Graduate School
2007-2008
Academic Bulletin**

Mathematical Physics

**College of Arts and Sciences
Bloomington**

University Graduate School Kirkwood Hall 111 Indiana University Bloomington, IN 47405 (812) 855-8853 Contact: grdschl@indiana.edu

Interdepartmental Graduate Committee on Mathematical Physics

(An asterisk [*] denotes membership in the University Graduate School faculty with the endorsement to direct doctoral dissertations.)

Professor John Challifour* (Mathematics, Physics), Chairperson; Distinguished Professors Roger Newton* (Emeritus, Physics), Ciprian Foias* (Emeritus, Mathematics); Professors Jiri Dadok* (Mathematics), Robert Glassey* (Mathematics), David Hoff* (Mathematics), Andrew Lenard* (Emeritus, Mathematics, Physics), Peter Sternberg* (Mathematics), Kevin Zumbrun* (Mathematics)

Academic Advisor

Professor John Challifour*, Swain Hall West 235, (812) 855-3257

Degree Offered

Doctor of Philosophy

This program offers advanced graduate training for superior students in the overlapping areas of mathematics, theoretical physics, and their applications from a unified point of view and promotes research in this field.

General supervision of the program is controlled by the Interdepartmental Graduate Committee on Mathematical Physics. While no master's degree is offered, a student may qualify for a master's degree in mathematics or physics during the course of study. A student usually enters the program at the beginning of the second year of graduate study in mathematics or physics.

Special Program Requirements

(See also [general University Graduate School requirements.](#))

Doctor of Philosophy Degree

Admission Requirements

Students in the Mathematical Physics Program must be enrolled in either the Department of Mathematics or the Department of Physics. Basic preparation should include courses in advanced calculus, linear algebra, modern algebra, complex variables, classical mechanics, electromagnetism, quantum mechanics, modern physics, thermodynamics, and statistical mechanics. Knowledge of the following fields is desirable: real analysis, differential equations, probability, topology, differential geometry, and functional analysis.

Course Requirements

A total of 90 credit hours, including dissertation. Required courses are determined by the advisory committee on the basis of the student's previous training and main fields of interest.

Advisory Committee

Composed of members of both the Department of Mathematics and the Department of Physics.

Minors

Mathematics and physics.

Foreign Language/Research-Skill Requirement

Same as in the department of residence.

Qualifying Examination

Consists of parts of the Departments of Mathematics and Physics qualifying examinations, as determined by the student's advisory committee.

Final Examination

Oral and public defense of dissertation.

Courses

See listings of the Departments of [Mathematics](#) and [Physics](#).