

**THE COLLEGE OF NEW JERSEY  
DEPARTMENT OF PHYSICS  
Project Proposal for PHY 393 - Independent Research I**

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**NAME:** \_\_\_\_\_ **PAWS ID:** \_\_\_\_\_

**Fall, Spring, Summer, 20** \_\_\_\_\_ **GPA:** \_\_\_\_\_

**MAJOR:** \_\_\_\_\_ **SO/JR/SR** \_\_\_\_\_ **E-Mail** \_\_\_\_\_

**TOTAL COURSE LOAD (INCLUDING IND RES)** \_\_\_\_\_ **COURSE UNITS**

**HAVE YOU TAKEN PHY 393 BEFORE?** Yes No (If yes, with whom?) \_\_\_\_\_

**SUMMARY OF PHYSICS DEPARTMENT GUIDELINES:**

- Students must meet with their faculty mentor at least once a week.
- A minimum of twelve hours of effort per week (per course unit) is expected for successful completion of the Independent Research.
- At the conclusion of the Independent Research, most will give a poster or oral presentation; this is optional for the first semester of PHY 393, but mandatory for the second.

**For those planning to take PHY 493 as a capstone in a future semester:** The prerequisite for admission to PHY 493 is 1.0 course units of PHY 393. At least 0.5 course units of PHY 393 must be with the same instructor as the intended PHY 493 instructor.

See the reverse side for some Independent Research requirements and read the full departmental syllabus for this course for a fuller discussion of expectations, evaluation and grading.

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State the specific problems, questions, or goals you intend to pursue in this study as well as the procedures you intend to use. (Typed statements are preferred.)

**THIS APPLICATION IS FOR** \_\_\_\_\_ **COURSE UNITS OF CREDIT.**

\_\_\_\_\_  
Student Signature

\_\_\_\_\_  
DATE Faculty Supervisor

\_\_\_\_\_  
DATE

\_\_\_\_\_  
Department Chairperson Approval

\_\_\_\_\_  
DATE

## PHY 393 – INDEPENDENT RESEARCH IN PHYSICS I

### **I. Basic Course Information**

PHY 393 is an upper level elective course in the physics curriculum open to all students in their junior or senior year with at least a 2.5 overall GPA; sophomores with a GPA of 3.0 are also eligible. To register for this course a student must obtain permission from a faculty mentor who agrees to supervise the research project, the Chairperson of the Physics Department and the Assistant Dean of Science. Independent Research experiences have the goal of producing new knowledge by the student in collaboration with a faculty member or with fellow student researchers and a faculty member.

The subject matter of the research experience will be agreed upon by a faculty mentor and the student. The experience will involve laboratory or observational experiences or complex calculations beyond what is covered in a lecture/laboratory course. It is expected that the research will build upon the knowledge gained by students in courses offered by the Department. This course is often taken as 0.5 CU in two successive semesters and often on top of the normal courses. While it can be repeated, only 1.0 CU can count toward the Physics Option or Physics Specialization, with any additional units counting toward general electives.

### **II. Learning Goals**

1. To obtain a deeper understanding and application of the scientific method.
2. To read and discuss the literature relevant to the research project.
3. To enhance a student's ability to obtain and analyze data, find correlations between variables, and draw conclusions.
4. To communicate the results of the project to others, typically via a scientific talk or poster.

### **III. Assessment**

Students will be continually assessed by the faculty mentor, based on their weekly progress. Furthermore, weekly meetings between the student and the faculty mentor will insure that a high quality product will be the outcome of the experience. At the end of the semester, students normally will present (via a poster or oral talk) the results of their research to the faculty members and students of the Physics Department, but this requirement may be waived the first time a student takes PHY 393 and an alternative final product may be evaluated.

### **IV. Learning Activities**

The learning activities will be determined by the faculty mentor and will be specific to each faculty-student designed research experience. Examples of these activities include:

1. Laboratory, field, or observatory experiences, computer modeling of physical systems, application of spectroscopic, telescopic or microscopic techniques.
2. Data analysis using advanced mathematical techniques or correlation methods.
3. Presentation of results using poster, PowerPoint or other medium.

### **V. Possible Overload**

Special permission is required to take more than 4.5 CU in a semester. A GPA of 3.3 or higher is expected for a student to do so and this overload is normally allowed for a single semester only.