This course is available for student registration only after the approval process has been completed.

**SUBJECT**  PHY  **COURSE NO.**  3901  **CREDIT HOURS**  1  **TERM TO BE ADDED TO THE FILE**  Summer 2007

CLASS HOURS  
LECTURE HOURS  
LAB HOURS  
CONTACT HOURS (CEU ONLY)  

**DEPARTMENT**  Physics and Space Sciences  
**SCHEDULE TYPE**  Special Project

☐ COLLEGE OF AERONAUTICS-23  ☐ COLLEGE OF PSYCHOLOGY AND LIBERAL ARTS-25  
☐ COLLEGE OF BUSINESS-24  ☐ COLLEGE OF SCIENCE-26  
☐ COLLEGE OF ENGINEERING-01  ☐ UNIVERSITY COLLEGE EXTENDED STUDIES-27

**COMPUTER TITLE**  Restricted to 25 characters, including spaces  Research Exp in Physics

**CATALOG TITLE**  Research Experience in Physics

**CATALOG DESCRIPTION OF COURSE**  Limited to 350 characters, including spaces

Individual research directed by a faculty member. May not be used in place of any core courses in the major program. Requires the preparation and presentation of a report on the research. May be repeated for a maximum of four credits. (Requirements: GPA of 3.0 or higher, sophomore or higher standing, and instructor and department head approval.)

In addition, you may attach a course syllabus and/or more detailed description.

**REQUIREMENTS**

☐ Prerequisite  
Course Number  
☑ Corequisite  
Course Number

☐ Prerequisite  
Course Number  
☐ Corequisite  
Course Number

☐ Prerequisite  
Course Number  
☐ Corequisite  
Course Number

**GRADES TO BE ISSUED**

☐ A, B, C, D, F  
☐ A, B, C, D, F, CEU  
☐ CEU  
☐ S, U  
☐ P, F  
☐ Other

**ADDITIONAL RESTRICTION**  Department Head and Instructor approval; GPA of 3.0 or higher; Sophomore or higher standing (e.g., Major, Class Level, Department Head Approval)

If this course replaces a course currently offered in BANNER, please indicate old course information.

**APPROVALS:** Upon completion of appropriate department approvals, submit form to Chair, Graduate Council, or Chair, Undergraduate Curriculum Committee for approval below and forward to Catalog Director.

Instructor: Hill  
Date: 10/13/06

Chair, Graduate Council:  
Date: 

Department Head and Program Chair:  
Date: 10/17/06

Dean or Associate Dean:  
Date: 

Chair, Undergraduate Curriculum Committee:  
Date: 

**CATALOG DIRECTOR**

These changes have been made for the University/Extended Studies Catalog and entered into the BANNER term named above.

Catalog Director:  
Date: 

**REGISTRAR'S USE ONLY**

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RG-271-5267
Catalog Entry: Individual research directed by a faculty member. May not be used in place of any core courses in the major program. Requires the preparation and presentation of a report on the research. May be repeated for a maximum of four credits. (Requirements: GPA of 3.0 or higher, sophomore or higher standing, and instructor and department head approval.)

INSTRUCTORS: Physics Faculty

- This course is not intended to be mandatory, but to give all P/SS undergraduates in the department an opportunity to participate in faculty research for credit and to document their research work on their transcript via the credit that they receive for this course.
- The course would be offered every semester with one section per each faculty.
- Students will not be able to substitute this course for any core course of the program. Students may use the course as a technical or free elective; however, a maximum of 6 credit hours in research (this Research Experience Course and/or existing Undergraduate Research for Seniors) may be applied towards fulfilling degree requirements. Note that students can currently already apply 6 credit hours from “Undergraduate Research” towards graduation.
- Mainly this course is considered “extra credit” that a student can earn. Students who need just one or two credits to fulfill their degree credit requirements (“gap filler”), e.g. transfer students, cannot use this course for that purpose unless they use it for an elective. Otherwise, they will be encouraged to register for Independent Study.
- Students will be required to write a (brief) research report on their research activities during the semester at the end of the course.
- Course grades will be “Satisfactory/Unsatisfactory” and would be based on the student’s performance in the lab and the quality of the final report.
- If such student research requires space that is not available in the mentoring faculty’s lab, such space can be made available in the rooms that house Senior Lab and/or Optics Lab (or possibly in the high bay).
- As the capstone of their student research projects, students would be given the opportunity to present their research and its results in talks and posters in one of the regular P/SS Senior Seminars (PHY/SPS 4200, 4210). Mentoring faculty would be encouraged to attend the seminar, which would further provide research-preparatory activities such as anonymous peer review of student presentations and papers. These student-written reviews will help not only those receiving the feedback, but will enrich the research preparation of the students writing the reviews. Students will also be encouraged in senior seminar to view videos of their own presentations in order to grow as public speakers. Students who chose not to participate in the research courses would research the literature on a topic of their interest and present their findings in the seminar.
- Students will also be given the chance to present their research work at a university-wide “Student Research Showcase” at Fl. Tech.
- Reports, posters, and presentation material that meet appropriate quality standards set by the P/SS faculty will be made public on the department’s web site.

Approved in P/SS Dept. meeting 10/18/2006

(prepared by M. Hohlmann)
This course is available for student registration only after the approval process has been completed.

Subject: SPS
Course No: 3901
Credit Hours: 1
Term to be added to the file: Summer 2007

Class Hours: LECTURE HOURS  Lab Hours: CONTACT HOURS (CEU ONLY)

Department: Physics and Space Sciences
Schedule Type: Special Project

☐ College of Aeronautics—23
☐ College of Psychology and Liberal Arts—25
☐ College of Business—24
☒ College of Science—26
☐ College of Engineering—01
☐ University College Extended Studies—27

Computer Title: Restricted to 25 characters, including spaces
Research Exp in Space Sci

Catalog Title: Research Experience in Space Sciences

Catalog Description of Course: Limited to 350 characters, including spaces
Individual research directed by a faculty member. May not be used in place of any core courses in the major program. Requires the preparation and presentation of a report on the research. May be repeated for a maximum of four credits. (Requirements: GPA of 3.0 or higher, sophomore or higher standing, and instructor and department head approval.)

In addition, you may attach a course syllabus and/or more detailed description.

Restrictions
☐ Prerequisite
Course Number
☐ Corequisite
Course Number

Grades to be issued
☐ A, B, C, D, F
☐ A, B, C, D, F, CEU
☐ CEU
☒ S, U
☐ P, F
☐ Other

Additional restriction: Department Head and Instructor approval; GPA of 3.0 or higher; Sophomore or higher standing (e.g., Major Class Level, Department Head Approval)

If this course replaces a course currently offered in BANNER, please indicate old course information

Subject: SPS
Course No: 3901

Approvals: Upon completion of appropriate department approvals, submit form to Chair, Graduate Council, or Chair, Undergraduate Curriculum Committee for approval below and forward to Catalog Director.

Originator: 10/13/06

Chair, Graduate Council: 10/13/06

Department Head/Program Chair

Dean or Associate Dean

Chair, Undergraduate Curriculum Committee

Catalog Director: 10/13/06

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SYLLABUS


Catalog Entry: Individual research directed by a faculty member. May not be used in place of any core courses in the major program. Requires the preparation and presentation of a report on the research. May be repeated for a maximum of four credits. (Requirements: GPA of 3.0 or higher, sophomore or higher standing, and instructor and department head approval.)

INSTRUCTORS: Space Science Faculty

- This course is **not intended to be mandatory**, but to give all P/SS undergraduates in the department an **opportunity to participate in faculty research for credit** and to **document** their research work on their transcript via the credit that they receive for this course.
- The course would be offered **every semester** with one section per each faculty.
- Students **will not be able to substitute this course for any core course of the program**. Students may use the course as a technical or free elective; however, a maximum of 6 credit hours in research (this Research Experience Course and/or existing Undergraduate Research for Seniors) may be applied towards fulfilling degree requirements. Note that students can currently already apply 6 credit hours from “Undergraduate Research” towards graduation.
- Mainly this course is considered **“extra credit”** that a student can earn. Students who need just one or two credits to fulfill their degree credit requirements (“gap filler”), e.g. transfer students, cannot use this course for that purpose unless they use it for an elective. Otherwise, they will be encouraged to register for Independent Study.
- Students will be **required to write a (brief) research report** on their research activities during the semester at the end of the course.
- Course **grades will be “Satisfactory/Unsatisfactory”** and would be based on the student’s performance in the lab and the quality of the final report.
- If such student research requires space that is not available in the mentoring faculty’s lab, such **space can be made available in the rooms that house Senior Lab and/or Optics Lab** (or possibly in the high bay).
- As the **capstone of their student research projects**, students would be given the opportunity to present their research and its results in **talks and posters in one of the regular P/SS Senior Seminars** (PHY/SPS 4200, 4210). Mentoring faculty would be encouraged to attend the seminar, which would further provide research-preparatory activities such as anonymous peer review of student presentations and papers. These student-written reviews will help not only those receiving the feedback, but will enrich the research preparation of the students writing the reviews. Students will also be encouraged in senior seminar to view videos of their own presentations in order to grow as public speakers. Students who chose not to participate in the research courses would research the literature on a topic of their interest and present their findings in the seminar.
- Students will also be given the chance to present their research work at a university-wide **“Student Research Showcase”** at Fl. Tech.
- Reports, posters, and presentation material that meet appropriate quality standards set by the P/SS faculty will be **made public** on the department’s web site.

Approved in P/SS Dept. meeting 10/18/2006

(prepared by M. Hohlmann)
Proposal for Quality Enhancement through Undergraduate Research

Committee on the Quality Enhancement Plan (QEP):  J. Dwyer, M. Hohlmann, N. Turner

1) Create 1-credit Undergraduate “Research Experience Courses” in the P/SS curriculum in each area to prepare for and complement the existing 3-credit “Undergraduate Research” for Seniors:

PHY 3901 (1cr.) Research Experience in Physics
Individual research directed by a faculty member. May not be used in place of any core courses in the major program. Requires the preparation and presentation of a report on the research. May be repeated for a maximum of four credits. (Requirements: GPA of 3.0 or higher, sophomore or higher standing, and instructor and department head approval.)

SPS 3901 (1cr.) Research Experience in Space Science
Individual research directed by a faculty member. May not be used in place of any core courses in the major program. Requires the preparation and presentation of a report on the research. May be repeated for a maximum of four credits. (Requirements: GPA of 3.0 or higher, sophomore or higher standing, and instructor and department head approval.)

- These courses are not intended to be mandatory, but to give all undergraduates in the department an opportunity to participate in faculty research for credit and to document their research work on their transcript via the credit that they receive for these new courses.
- The courses would be offered every semester with one section per each faculty.
- Students will not be able to substitute these courses for any core course of the program or even any electives. They would be considered “extra credit” that a student can earn. Students who need just one or two credits to fulfill their degree credit requirements (“gap filler”), e.g. transfer students, cannot use these courses for that purpose. They will be encouraged to register for e.g. Independent Study.
- Students will be required to write a (brief) research report on their research activities during the semester at the end of the course.
- Course grades will be satisfactory/unsatisfactory and would be based on the student’s performance in the lab and the quality of the final report.
- If such student research requires space that is not available in the mentoring faculty’s lab, such space can be made available in the rooms that house Senior Lab and/or Optics Lab (or possibly in the high bay).
- If such student research requires equipment that is not available in the department, funding from the QEP should be made available to the students.

2) As the capstone of the student research project, students would be given the opportunity to present this research and its results in talks and posters in one of the regular P/SS Senior Seminars (PHY/SPS 4200, 4210). Mentoring faculty would be encouraged to attend the seminar.

Senior seminar would further provide research-preparatory activities such as anonymous peer review of student presentations and papers. These student-written reviews will help not only those receiving the feedback, but will enrich the research preparation of the students writing the reviews. Students will also be encouraged in senior seminar to view videos of their own presentations in order to grow as public speakers.
Students who chose not to participate in the research courses would research the literature on a topic of their interest and present their findings in the seminar.

3) Students will also be given the chance to present their work at a university-wide “Student Research Showcase” at Fl. Tech.

4) Reports, posters, and presentation material that meet appropriate quality standards set by the faculty will be made public on the department’s web site.

**Conclusion:** This integrated approach between the Research Experience courses and the Senior Seminar will more effectively prepare our students for real-word research by emulating all important steps from idea to project to scientific presentation. In the ideal case, this experience would permeate almost the entire undergraduate career of a student in the P/SS department. As a side benefit, **faculty would receive credit** for the time and effort they spend mentoring undergraduate students in research projects.

v.4 – incorporating changes suggested by the Registrar’s office and approved in P/SS curriculum committee meeting on 10/13//2006, v.3 approved in P/SS Dept. meeting on 10/11/2006.

*M. Hohlmann, 10/13/2006 (on behalf of the P/SS QEP committee)*