Thesis Research  
PHYS 5389

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Office: 103 STEM Building Rm 207O  
Office Hours: Monday 3-5 pm, Tuesday & Thursday 1-3 pm  
Department: Department of Physics, Engineering, and Astronomy  
Class meeting time and place: Wednesdays 2-4pm plus additional

Course Description:  
One hour of credit. Experimental or theoretical independent study in research toward a thesis.

Text and Materials:  
Various publications and An Introduction to Infectious Disease Modelling, Emilia Vynnycky  
ISBN: 0198565763

Course Requirements:  
The course will involve modeling and analysis of various infectious diseases. Initial analysis will  
lead to the writing of numerical simulations and the validation of the numerical models. We will  
look at compartmental models (SIR, SEIR) as well as agent based models for more complex  
scenarios.

Course Calendar:  
The course calendar will depend upon the topic of this independent student. The specific  
course syllabus will provide a description of the milestones or events. Typical lists of events  
that describe the scientific method are given below.

<table>
<thead>
<tr>
<th>Week(s)</th>
<th>Milestone or Event</th>
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<tbody>
<tr>
<td>1</td>
<td>Pick a pathogen and decide on the analysis to be performed.</td>
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<tr>
<td>2</td>
<td>Do background research and collect initial data.</td>
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<td>3</td>
<td>Design a numerical model and begin data analysis</td>
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<td>4</td>
<td>Perform simulations with the model and refine the code.</td>
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<td>5</td>
<td>Analyze the results of simulation and compare to real data. Organize the material for a final report.</td>
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<td>6</td>
<td>Draw conclusions, finish the final report and submit edited version.</td>
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Grading Policy:
The grading policy will depend upon the type of special problem covered in the course. The specific course syllabus will not only describe the special problem but will also provide the grading policy specific to the course. Letter grades are based on the following ranges: A: 90.0 – 100, B: 80.0 - 89.9, C: 70.0 - 79.9, D: 60.0 - 69.9, F: 0 - 59.9.

Attendance Policy:
Attendance will be taken at the beginning of each class. If you have 3 unexcused absences, then your final grade will be reduced by one letter grade. If you have 4 unexcused absences, you will receive an “F” in the course. To receive an excused absence a written and signed notice is required within three class days of the absence. If you miss class without approval of your instructor you will receive a grade of zero on the missed assignment. Authorized absences must be approved by your instructor in advance of the absence unless you have an emergency or illness. Make-up work must be completed outside of normal class hours and within one week following an excused absence. It is your responsibility to see your instructor and make arrangements for make-up work.

Program Learning Outcomes (PLO)
1. The student will demonstrate proficiency in the basic and computational fields of physics.
2. The student will apply physical principles to novel situations, both in the classroom and in research settings.
3. The student will develop good experimental technique, including proper setup and care of equipment, conducting experiments and analyzing results in order to observe physical phenomena, assess experimental uncertainty, and make meaningful comparisons between experiment and theory.
4. The student will develop effective written and oral communication skills, especially the ability to transmit complex technical information in a clear and concise manner.
5. The student will be able to work effectively in groups or teams.
6. The student will appreciate the importance and practice of ethics in science.

Student Learning Outcomes (SLO)
By the end of the course, a successful student will be able to:
- Conduct the study by means of literature research, fieldwork, and/or laboratory work. (PLO 2)
- Demonstrate competency in experimental design and scientific data collection and analysis. (PLO 3)
- Present the results of the study in a written or oral report. (PLO 4)

General Education Core Curriculum Objectives/Outcomes (EEO)
There are no specific general education core curriculum objectives in this course. This course is not a general education core curriculum course.
Academic Integrity (A-9.1)

Academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism.

Definition of Academic Dishonesty
Academic dishonesty includes both cheating and plagiarism. Cheating includes but is not limited to (1) using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class; (2) the falsification or invention of any information, including citations, on an assigned exercise; and/or (3) helping or attempting to help another in an act of cheating or plagiarism. Plagiarism is presenting the words or ideas of another person as if they were your own. Examples of plagiarism are (1) submitting an assignment as if it were one’s own work when, in fact, it is at least partly the work of another; (2) submitting a work that has been purchased or otherwise obtained from an Internet source or another source; and (3) incorporating the words or ideas of an author into one’s paper without giving the author due credit.

Please read the complete policy at http://www.sfasu.edu/policies/academic_integrity.asp

Withheld Grades Semester Grades Policy (A-54)

Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average.

Students with Disabilities

To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to http://www.sfasu.edu/disabilityservices/.