

PHY7097 - Adv Top Theor Phys (Biophysics)  
Classes: MWF, 12:50PM – 1:40 PM (Period 6)  
Classes will be delivered in person in NPB1200.

**Instructors:**

Prof. Purushottam Dixit (primary)

Email: pdixit@ufl.edu (communication about this course should be sent via Canvas)

Office: NPB 2326

Office Hour: Wednesday, 1:55 - 2:45 PM

Prof. BingKan Xue.

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Prof. Juan Guan

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Office Hour: 10:30 am - 12:30 pm on Wednesdays, NPB2368 and concurrent zoom

<https://ufl.zoom.us/j/98446182484?pwd=M2JubDRmWFB0d3ZhTFdNaGljSTRzUT09>

Meeting ID: 984 4618 2484

Passcode: 041249

**Objectives:**

This will be a seminar-style course with a reading list that will comprise current as well as classic, influential papers in biophysics. This year's focus will be on advanced experimental methods in biophysics, and machine learning methods for biophysical data analysis. These methods will be studied in the context of major themes in classic and current biophysics research. The course requires basic physics and no biology background. It should be accessible to general graduate students and senior undergraduates in physical science and engineering.

**Prerequisites:**

This course should be accessible to graduate students from a broad background. It is recommended for early-year graduate students who are considering or have chosen to work on biological physics. It can also be appreciated by senior undergraduate students (with permission from the instructor) or graduate students from other fields who are interested in learning about the scope of biophysics research. Basic knowledge and quantitative skills of undergraduate physics would be useful; no training in biology is required, though some exposure to the subject would be helpful.

**Textbooks:**

No textbook is required. We will read research articles from scientific journals, which can be accessed online (through subscription provided by UF Libraries, may require VPN) and will also be uploaded to Files.

**Description:**

The course will be taught jointly by multiple biophysics faculty, each covering a few selected topics within their expertise. We will generally learn about one topic every week and read one paper per class. The topics are organized according to "themes" that appeal to a physics style, i.e., common patterns and general principles found in various biological systems.

We will meet thrice a week. The class time will be divided into lectures and discussions. During the lecture, the instructor will go over the background of the topic, the main idea of the particular paper(s) and their impact, and more recent developments of the subject. In the discussion, the students will answer questions from the instructor and other students on the details of the paper.

**Assignments:**

The papers to read each week are listed below (see Schedule). The students are expected to have read the paper before the class (should take 1~2 hours) and to come with questions. We will let the students take turns to lead the discussion for each class. The leader will invite questions and elicit answers from other students, so that everyone understands the paper. After the discussion, there will be a quiz (10 min) containing questions on the paper that all students have to take (see Quizzes).

At the end of the semester, every student will finish a small project related to one of the topics covered in the course. The project can be, for example, a follow-up on one of the topics to find and summarize new developments or address a simple question that was not answered before. Some projects will be suggested by the instructors during the semester, but the students are welcome to find their own projects. Each student should discuss the choice of project with one of the instructors and get approval two weeks before classes end (by Thanksgiving). As the final exam, every student will write a report (~3 pages) on the project and give a short presentation (~12 min) to the class.

**Grading:**

The final grade will consist of both the class quizzes (50%) and the final project (50%):

Quizzes will be taken during the class. Each quiz will be graded on a 0-5 scale. Your lowest quiz score will be dropped when calculating the average score. The project will serve as the final exam. It will be graded by the approval from an instructor (5%), the presentation (15%) and the report (30%). Attendance at all class meetings is expected. A student who seeks a makeup for missed work should contact the instructor as soon as practical and be prepared to document any excuse. See detailed policies below.

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at:

<https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>Links to an external site.

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting:

<https://disability.ufl.edu/students/get-started/>Links to an external site.

It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Information on current UF grading policies for assigning grade points may be found at:

<https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>Links to an external site.

**Evaluation:**

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at:

<https://gatorevals.aa.ufl.edu/students/>Links to an external site.

Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via [ufl.bluera.com/ufl/](http://ufl.bluera.com/ufl/). Summaries of course evaluation results are available to students at:

<https://gatorevals.aa.ufl.edu/public-results/>Links to an external site.