

# PHY 4523, STATISTICAL PHYSICS - Spring 2023

## SYLLABUS

**CLASS TIME & PLACE:** M,W,F 8<sup>TH</sup> Period

**PLACE:** Psychology Room 151

**Courses will be F2F (synchronous via CANVAS)**

**Instructor:** Neil Sullivan

**Office:** NPB #2235

**Email:** [sullivan@phys.ufl.edu](mailto:sullivan@phys.ufl.edu)

**Preferred form of contact:** Email

**Office Hours:** Office hours: T & Th 6<sup>th</sup> Pd (Feel free to email for a zoom appointment outside office hours)

**Communications:** via Canvas email or Canvas Announcements

**Class Compartment:** Students should observe a professional “netiquette” when participating in discussion sections or in office hours on zoom.

### REQUIRED AND RECOMMENDED MATERIALS FOR THIS COURSE

**Required textbook:**

[Introductory Statistical Mechanics by R. Bowley and M. Sanchez](#) (2<sup>nd</sup> ed., Clarendon Press, Oxford, 2000).

**Recommended reference:**

[Topics in Statistical Mechanics by B.P. Cowan](#) (1<sup>st</sup> ed., Imperial College Press, London, 2005).

**COURSE DESCRIPTION:** PHY 4523 focuses on the statistical treatment of the (quantum mechanical or classical) dynamics of individual particles and the general physical properties that can be deduced.

*Statistical mechanics* is a very general framework for analyzing equilibrium systems which also provides a microscopic basis for thermodynamics. We will look at many applications of statistical thermodynamics taken from different areas of physics.

**PRE-REQUISITES:** It will be assumed that you have successfully completed an introductory course in classical thermodynamics at the level of PHY 3513 (Thermal Physics) or PHY 3062 (Accelerated General Physics III). Some experience with quantum mechanics will be advantageous but not absolutely necessary.

**EXPECTATIONS:** It is expected that students read textbook chapters thoroughly at least once, preferably before the class and review lecture notes timely. Students should work on homework problems diligently.

**HOMEWORK:** You will be assigned short homework problem sets from chapters in the assigned textbook to be turned in by uploading a pdf file in Canvas at the end of the week of the assignment. A list of all assigned problems is found in the **COURSE CALENDAR**. You will also be recommended to attempt other problems from the textbook. You are expected to work on your own and your submitted homework papers should be your own work. The homework will account for 35% of your overall score in PHY 4523. The homework must be submitted on time and be legible to count for credit.

**QUIZZES:** In addition to homework sets there will be short in-class quizzes based on problems related to the material covered in lectures.

**EXAMS:** There will be two on-line mid-term exams and one final written paper. The exams will be designed to test your understanding of fundamental concepts and methods. Memorization and regurgitation of material covered in lectures and homework will not be sufficient. Formula sheets or textbooks will be allowed; details will be announced nearer the time. **The final paper will be written on a topic of the student's choice but must be approved by the instructor.**

**Policy on missed Assignment, Exam or Quiz:** For missed assignments, exams or quizzes students should submit a justification (such as a medical or family emergency) and send a request by email to the instructor for a makeup assignment. The make-up policy is consistent with university policies that can be found at <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx> (Links to an external site.).

**Grade Return Timing:** In normal operations (barring major storms or internet outages etc.) students should expect grades to be returned (accessible via canvas) within 10 days of the due date.

In the event of a documented conflict with another event, it may be possible to take an exam shortly after its scheduled time. Make-up exams will be offered only for serious medical conditions or University-approved absences supported in writing by the appropriate professional. Any request for a special exam sitting or a make-up must be made a week ahead for any scheduled absence, and as soon as reasonably possible after an unforeseen absence.

**COMPOSITION OF GRADE:** Your grade will be assigned on the basis of an overall score, derived as follows:

Homework	35%
Quizzes	5%
Exams	45%
Final Paper	15%

## PROJECTED GRADING SCALE\*

Grade	A	A-	B+	B	B-	C+	C	C-	D+	D-
G. Pt.	4.0	3.67	3.33	3.0	2.67	2.33	2.0	1.67	1.33	0.67
Score	94+	90+	87+	84+	80+	77+	74+	70+	67+	61

\*The actual grading scale may vary depending on numerous factors within +/- 2.5 points out of 100. There will also be an extra-credit assignment which will allow you the chance to compensate at least partially for missed homework or a poor performance on the first exam.

## UF POLICIES SHAPING THIS COURSE

- **Contact Hours:** "Contact Hours" refers to the hours per week in which students are in contact with the instructor, excluding office hours or other voluntary contact. The number of contact hours in this course equals the number of credits the course offers.
- **Workload:** As a Carnegie I, research-intensive university, UF is required by federal law to assign at least 2 hours of work outside of class for every contact hour. Work done in these hours may include reading/viewing assigned material and doing explicitly assigned individual or group work, as well as reviewing notes from class, synthesizing information in advance of exams or papers, and other self-determined study tasks.
- **Accommodation for Student with Disabilities:** 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/>. This class supports the needs of different learners; 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.
- **Statement Regarding Evaluations:** 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 from [the Gatorevals website \(Links to an external site.\)](#). 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 [the evaluation system. \(Links to an external site.\)](#) Summaries of course evaluation results are available to students at the [public results website \(Links to an external site.\)](#).
- **Statement Regarding Course Recording:** Our class sessions may be audio visually recorded for students in the class to refer back to and for use of enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, keep your camera off and do not use a profile image. Likewise, students who unmute during class and participate verbally are agreeing to have their voices recorded. If you are unwilling to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

## ADDITIONAL UF POLICIES AND RESOURCES

**The following are additional policies that shape my approach to teaching.**

**UF students are bound by The Honor Pledge** which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code ([sccr.dso.ufl.edu/process/student-conduct-code/](http://sccr.dso.ufl.edu/process/student-conduct-code/)) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor in this class.

**UNIVERSITY POLICE** The UF police are together for a safe campus. 392-1111 (or 9-1-1 for emergencies) ([Links to an external site.](http://www.police.ufl.edu/))<http://www.police.ufl.edu/>.

**COUNSELING and WELLNESS Center** [Counseling and Wellness Center \(Links to an external site.\)](#) (352-392-1575) provides counseling and support as well as crisis and wellness services including a variety of workshops ([Links to an external site.](#)) throughout the semester (e.g., Yappy Hour, Relaxation and Resilience).

**Career Connections Center** [The Career Connections Center \(Links to an external site.\)](#) (352-392-1601 | [CareerCenterMarketing@ufsa.ufl.edu](mailto:CareerCenterMarketing@ufsa.ufl.edu)) connects job seekers with employers and offers guidance to enrich your collegiate experience and prepare you for life after graduation.

### **Dean of Students Office:**

[The Dean of Students Office \(Links to an external site.\)](#) (352-392-1261) provides a variety of services to students and families, including [Field and Fork \(Links to an external site.\)](#) (UF’s food pantry) and [New Student and Family programs](#).

**Disability Resource Center** [The Disability Resource Center \(Links to an external site.\)](#) ([DRCaccessUF@ufsa.ufl.edu](mailto:DRCaccessUF@ufsa.ufl.edu) | 352-392-8565) helps to provide an accessible learning environment for all by providing support services and facilitating accommodations, which may vary from course to course. Once registered with DRC, students will receive an accommodation letter that must be presented to the instructor when requesting accommodations. Students should follow this procedure as early as possible in the semester.

**Multicultural and Diversity Affairs** [Multicultural and Diversity Affairs \(Links to an external site.\)](#) (352-294-7850) celebrates and empowers diverse communities and advocates for an inclusive campus.

**Office of Student Veteran Affairs** [The Office of Student Veteran Services \(Links to an external site.\)](#) (352-294-2948 | [vacounselor@ufl.edu](mailto:vacounselor@ufl.edu)) assists student military veterans with access to benefits.

**ONE.UF** [ONE.UF \(Links to an external site.\)](#) is the home of all the student self-service applications, including access to: • [Advising \(Links to an external site.\)](#) • [Bursar \(Links to an external site.\)](#) (352-392-0181) • [Financial Aid \(Links to an external site.\)](#) (352-392-1275) • [Registrar \(Links to an external site.\)](#) (352-392-1374)

### **Official Sources of Rules and Regulations**

The official source of rules and regulations for UF students is the [Undergraduate Catalog \(Links to an external site.\)](#) and [Graduate Catalog \(Links to an external site.\)](#). Quick links to other information have also been provided below. • [Student Handbook \(Links to an external site.\)](#) • [Student Responsibilities \(Links to an external site.\)](#), including academic honesty and student conduct code • [e-Learning Supported Services Policies \(Links to an external site.\)](#) includes links to relevant policies including Acceptable Use, Privacy, and many more • [Accessibility \(Links to an](#)

[external site.](#)), including the Electronic Information Technology Accessibility Policy and ADA Compliance • [Student Computing Requirements \(Links to an external site.\)](#), including minimum and recommended technology requirements and competencies.