PHYS 8101: Quantum Theory I

Instructor: Dr. M. Bachmann
Office: room 309
Email: bachmann@smsyslab.org
Course website: www.smsyslab.org/teaching.html

Topics: In this first of the two courses, we review and deepen the understanding of the basic concepts of nonrelativistic quantum mechanics in the abstract operator and the physically more comprehensible (but mathematically less tractable) path integral formalisms. Numerous applications will be discussed along these lines. Eventually, advancing toward the relativistic formulation will prepare us for a more coherent look at quantum phenomena in the context of second quantization and, ultimately, field quantization in the second course.

References: The following references can be used as guides for the first part (PHYS 8101), but the course does not follow a single text book:
Theoretical Physics 6+7: Quantum Mechanics by W. Nolting; *Modern Quantum Mechanics* by J. J. Sakurai and J. Napolitano; *Quantum Mechanics and Path Integrals* by R. P. Feynman and A. R. Hibbs; *Path Integrals in Quantum Mechanics, Statistics, Polymer Physics, and Financial Markets* by H. Kleinert

Class: Tuesday and Thursday, 11:10am–12:25pm, room 254.

Office Hours: You can contact me at any time.

Exams: Midterm and Final (take-home). The midterm exam will be in early October; the final exam in December. In both exams, only own hand-written lecture notes and homework solutions are admitted. An exam that was missed without documented reason is assigned the grade F. If the instructor decides that missing an exam was excusable, an oral make-up exam will be set up online. If you should be unable to take an exam for medical reasons, you must inform me before the exam starts and send me a copy of the original medical visit verification provided by your doctor by end of the exam day.

Homework: There will be graded assignments on a regular basis (typically bi-weekly) with strict deadlines. Late homework will not be accepted. Do not submit homework via email (unless directed otherwise).

Grade: Total Grade = (Homework + Midterm + Final)/3

Grading: [100,85]: A; (85,82.5]: A^-; (82.5,80]: B^+; (80,70]: B; (70,67.5]: B^-; (67.5,65]: C^+; (65,55]: C; (55,52.5]: C^-; (52.5,40]: D; (40,0]: F

COVID-19: Please adhere to the precaution guidelines issued by CDC and UGA strictly. Do not attend classes if you have COVID-19 symptoms or have tested positive. Wearing a mask or an appropriate face covering in class is recommended.

Academic Honesty: All members of the academic community are committed to honesty. The academic honesty policy statement of UGA can be viewed online at www.uga.edu/honesty.