

PHY390 Quantum Mechanics

Gustavus Adolphus College Fall 2019

Instructor: Dr. Steven Mellema

Office: Olin Hall 210

Office Hours: MTWRF 10:30-11:20 AM

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Textbooks:

Required – *A Modern Approach to Quantum Mechanics*, Second Edition, by John S. Townsend, University Science Books, ©2012

– *Mathematical Handbook of Formulas and Tables*, by Murray R. Spiegel
(Schaum's Outline Series)

Course Policy and Evaluation:

1. **Class Meetings and Reading Assignments:** The class will meet five days a week from 9:00-9:50 AM for lecture, small-group problem solving, homework review and exams. Attached is a daily calendar of activities for the course. When reading assignments are made for a class session, the reading is expected to be completed **before** coming to the class.
2. **Homework:** Homework problems will be assigned according to chapters in the textbook, and are due at the beginning of class on the due date listed on the calendar. Late homework may be accepted at the discretion of the instructor with a reduction in credit.
3. **Group Problems:** Occasionally in class, students will work together, in assigned groups of 2-3 members, to cooperatively solve problems. A group solution will be submitted, with all group members receiving the same grade. There will be no make-up for group problems missed due to absence.
4. **Problem Presentations:** After completing the lectures for each chapter in the textbook, we will take one day to have example problem solutions presented to and discussed by the class. These problems will be assigned to specific student presenters approximately one week in advance, and all students will take turns to present problem solutions. Students will earn credit both for their presentations and for their thoughtful discussion of others' presentations.
5. **Exams :** There will be three hour exams and a two-hour final exam (see the calendar below). Students must arrange **in advance** to take an exam at other than the scheduled time, and may do so **only** for a valid health or school-related reason. (It is the responsibility of the student to inform the instructor during the first week of the semester regarding any anticipated absences due to required field trips, athletic events, musical performances, or other extra-curricular activities.) Exams missed without pre-arrangement are entered as zero credit and cannot be made up.

6. Evaluation :	Homework	25%
	Group Problems	5%
	In-Class Problem Presentations	10%
	Hour Exams	15% each
	Final Exam	15%

Assignment of final letter grades will be based upon the following guidelines:

	B+ = 86-90%	C+ = 74-78%	D+ = 62-66%
A = 94-100%	B = 82-86%	C = 70-74%	D = 58-62%
A- = 90-94%	B- = 78-82%	C- = 66-70%	

- Attendance :** Regular attendance at all class meetings is expected. Students will be held responsible for informing themselves of all announcements/assignments made in class.
- Incompletes :** A grade of incomplete will **only** be given for work not completed due to circumstances beyond the control of the student (*this is the College policy*).
- Academic Honesty:** Having signed and agreed to abide by the College’s Honor Code, students thereby pledge that, in all academic exercises, examinations, papers, and reports, they shall submit their own work. Footnotes, or some other acceptable form of citation must accompany any use of another's words or ideas. In the context of this course, students are expected to collaborate and to discuss their out-of-class assignments. However, submitting under one’s own name work that is merely copied from another is a violation of the Honor Code. (Full descriptions of the Academic Honesty Policy and the Honor Code can be found in the Academic Catalog, online at https://gustavus.edu/general_catalog/current/acainfo. For more information about the Honor Code, contact Dean Valerie Banschbach (vbanschbach@gustavus.edu or x7541).
- Accessibility Resources:** Gustavus Adolphus College is committed to ensuring equitable and inclusive learning environments for all students. If you have a disability and anticipate or experience barriers to equal access, please speak with the accessibility resources staff about your needs. A disability may include mental health, attentional, learning, chronic health, sensory, physical, and/or short-term conditions. When appropriate, staff will guide students and professors in making accommodations to ensure equal access. Accommodations cannot be made retroactively; therefore, to maximize your academic success at Gustavus, please contact them as early as possible. Accessibility resources staff are located in the Academic Support Center (<https://gustavus.edu/care/accessibility/>). Accessibility Resources Coordinator, Katy Clay, (clayk@gustavus.edu) (x7227), can provide further information.
- Help for Multilingual Students:** Some Gusties may have grown up speaking a language (or languages) other than English at home. If so, we refer to you as “multilingual.” Your multilingual background is an incredible resource for you, and for our campus, but it can come with some challenges. You can find support through the Center for International and Cultural Education’s (<https://gustavus.edu/cice/>) Multilingual and Intercultural Program Coordinator (MIPC), Carly Overfelt (overfelt@gustavus.edu). Carly can meet individually for tutoring in writing, consulting about specific assignments, and helping students connect with the College’s support systems. If you want help with a specific task (for example, reading word problems on an exam quickly enough or revising grammar in essays), let your professor and Carly know as soon as possible. In addition, the Writing Center (<https://gustavus.edu/writingcenter/>) offers tutoring from peers (some of whom are themselves multilingual) who can help you do your best writing.

September 2019

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2 No Class (Labor Day)	3 Classes begin; Syllabus; Introduction	4 Townsend Sections 1.1-1.2	5 Townsend Sections 1.3-1.4	6 Townsend Sections 1.5-1.6	7
8	9 Problem Presentations Chapter 1	10 Townsend Sections 2.1-2.2 Chapter 1 Homework Due	11 Townsend Sections 2.3-2.4	12 Townsend Sections 2.5-2.6	13 Townsend Sections 2.7-2.8	14
15	16 Problem Presentations Chapter 2	17 Townsend Sections 3.1-3.2 Chapter 2 Homework Due	18 Townsend Sections 3.3-3.4	19 Townsend Sections 3.5-3.6	20 Townsend Sections 3.7-3.8	21
22	23 Problem Presentations Chapter 3	24 No Class (Nobel Conference)	25 No Class (Nobel Conference)	26 Townsend Sections 4.1-4.2 Chapter 3 Homework Due	27 Townsend Sections 4.3-4.4	28
29	30 Townsend Section 4.5					

October 2019

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1 Hour Exam #1 Chapters 1-3	2 Townsend Sections 4.6-4.7	3 Problem Presentations Chapter 4	4 Townsend Sections 5.1-5.2 Chapter 4 Homework Due	5
6	7 Townsend Sections 5.3-5.4	8 Townsend Section 5.5	9 Townsend Section 5.6	10 Townsend Section 5.7	11 Problem Presentations Chapter 5	12
13	14 Townsend Sections 6.1-6.3 Chapter 5 Homework Due	15 Townsend Sections 6.4-6.6	16 Townsend Sections 6.7-6.8	17 Townsend Section 6.9	18 Townsend Sections 6.10-6.11	19
20	21 No Class Fall Break	22 No Class Fall Break	23 Problem Presentations Chapter 6	24 Townsend Sections 7.1-7.3 Chapter 6 Homework Due	25 Townsend Sections 7.4-7.6	26 Physics GRE
27	28 Townsend Sections 7.7-7.8	29 Hour Exam #2 Chapters 4-6	30 Townsend Sections 7.9-7.11	31 Problem Presentations Chapter 7		

November 2019

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1 Townsend Sections 9.1-9.2 Chapter 7 Homework Due	2
3	4 Townsend Sections 9.3-9.4	5 Townsend Sections 9.5-9.6	6 Townsend Sections 9.7-9.8	7 Townsend Sections 9.9-9.10	8 Problem Presentations Chapter 9	9
10	11 Townsend Sections 10.1-10.2 Chapter 9 Homework Due	12 Townsend Section 10.3	13 Townsend Section 10.4	14 Townsend Section 10.5	15 Townsend Section 10.6	16
17	18 Problem Presentations Chapter 10	19 Townsend Sections 11.1-11.2 Chapter 10 Homework Due	20 Townsend Section 11.3	21 Townsend Section 11.4	22 Townsend Section 11.5	23
24	25 Hour Exam #3 Chapters 7,9, and 10	26 Townsend Section 11.6	27 No Class Thanksgiving Break	28 No Class Thanksgiving Break	29 No Class Thanksgiving Break	30

December 2019

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2 Problem Presentations Chapter 11	3 Townsend Section 12.1 Chapter 11 Homework Due	4 Townsend Section 12.2	5 Townsend Section 12.3	6 Townsend Sections 12.4-12.5	7
8	9 Problem Presentations Chapter 12	10 Townsend Section 13.1 Chapter 12 Homework Due	11 Townsend Section 13.2	12 Townsend Section 13.3	13 Final Exam Review Chapter 13 Homework Due	14 Reading Day
15	16	17 10:30am-12:30pm Final Exam (50% on Chapters 11-13; 50% comprehensive review)	18	19	20	21
22	23	24	25	26	27	28
29	30	31				