

PHY390 Quantum Mechanics

Gustavus Adolphus College Fall 2018

Instructor: Dr. Steven Mellema

Office: Olin Hall 210

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

Phone: 933-7306

Email: mellema@gustavus.edu

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 four 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	10% each
	Final Exam	20%

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%	

7. **Attendance :** Regular attendance at all class meetings is expected. Students will be held responsible for informing themselves of all announcements/assignments made in class.
8. **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*).
9. **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. (The full text of the Gustavus Academic Honor Code Policy may be found at: https://gustavus.edu/general_catalog/current/acainfo).
10. **Disability Services:** Gustavus Adolphus College is committed to ensuring the full participation of all students in its programs. If you have a documented disability, or you think you may have a disability of any nature (e.g., mental health, attentional, learning, chronic health, sensory, or physical) and, as a result, need reasonable academic accommodation to participate in class, take tests or benefit from the College's services, then you should speak with the Accessibility Resources staff, for a confidential discussion of your needs and appropriate plans. Course requirements cannot be waived, but reasonable accommodations may be provided based on disability documentation and course outcomes. Accommodations cannot be made retroactively; therefore, to maximize your academic success at Gustavus, please contact Accessibility Resources as early as possible. Accessibility Resources (<https://gustavus.edu/care/accessibility/>) is located in the Center for Academic Resources and Enhancement. Accessibility Resources Coordinator, Kelly Karstad, (kkarstad@gustavus.edu or x7138), can provide further information.
11. **Help for Students Whose First Language is not English:** Support for English learners and multilingual students is available through the Center for International and Cultural Education's (<https://gustavus.edu/cice/>) Multilingual and Intercultural Program Coordinator (MIPC), Carly Overfelt (coverfel@gustavus.edu). The MIPC can meet individually with students for tutoring in writing, consulting about academic tasks, and helping students connect with the College's support systems. When requested, the MIPC can consult with faculty regarding effective classroom strategies for English learners and multilingual students. If requested, the MIPC can provide students with a letter to a professor that explains and supports appropriate academic arrangements (e.g., additional time on tests, additional revisions for papers). Professors make decisions based on those recommendations at their own discretion. In addition, English learners and multilingual students can seek help from peer tutors in the Writing Center (<https://gustavus.edu/writingcenter/>).

SEPTEMBER 2018

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SAT/SUN
						1/2
1	3 No Class (Labor Day)	4 Classes begin; Syllabus; Introduction	5 Townsend Sections 1.1-1.2	6 Townsend Sections 1.3-1.4	7 Townsend Sections 1.5-1.6	8/9
2	10 Problem Presentations Chapter 1	11 Townsend Sections 2.1-2.2	12 Townsend Sections 2.3-2.4	13 Townsend Sections 2.5-2.6	14 Townsend Sections 2.7-2.8	15/16
	notes	Chapter 1 Homework Due				
3	17 Problem Presentations Chapter 2	18 Townsend Sections 3.1-3.2	19 Townsend Sections 3.3-3.4	20 Townsend Sections 3.5-3.6	21 Townsend Sections 3.7-3.8	22/23
	notes	Chapter 2 Homework Due				
4	24 Problem Presentations Chapter 3	25 Townsend Sections 4.1-4.2	26 Townsend Sections 4.3-4.4	27 Townsend Section 4.5	28 Hour Exam #1 Chapters 1-3	29/30
	notes	Chapter 3 Homework Due				

OCTOBER 2018

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SAT/SUN
5 WEEK	1 Townsend Sections 4.6-4.7	2 No Class (Nobel Conference)	3 No Class (Nobel Conference)	4 Problem Presentations Chapter 4	5 Townsend Sections 5.1-5.2	6/7
					Chapter 4 Homework Due	
6 WEEK	8 Townsend Sections 5.3-5.4	9 Townsend Section 5.5	10 Townsend Section 5.6	11 Townsend Section 5.7	12 Problem Presentations Chapter 5	13/14
7 WEEK	15 Townsend Sections 6.1-6.3	16 Townsend Sections 6.4-6.6	17 Townsend Sections 6.7-6.8	18 Townsend Section 6.9	19 Townsend Sections 6.10- 6.11	20/21
	Chapter 5 Homework Due					
8 WEEK	22 No Class (Fall Break)	23 No Class (Fall Break)	24 Problem Presentations Chapter 6	25 Townsend Sections 7.1-7.3	26 Townsend Sections 7.4-7.6	27/28
				Chapter 6 Homework Due		Physics GRE
9 WEEK	29 Townsend Sections 7.7-7.8	30 Hour Exam #2 Chapters 4-6	31 Townsend Sections 7.9- 7.11			

NOVEMBER 2018

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SAT/SUN
9 WEEK				1 Problem Presentations Chapter 7	2 Townsend Sections 9.1-9.2	3/4
					Chapter 7 Homework Due	
10 WEEK	5 Townsend Sections 9.3-9.4	6 Townsend Sections 9.5-9.6	7 Townsend Sections 9.9-9.10	8 Problem Presentations Chapter 9	9 Townsend Sections 10.1-10.2	10/11
					Chapter 9 Homework Due	
11 WEEK	12 Townsend Section 10.3	13 Townsend Section 10.4	14 Townsend Section 10.5-10.6	15 Problem Presentations Chapter 10	16 Townsend Sections 11.1-11.2	17/18
					Chapter 10 Homework Due	
12 WEEK	19 Townsend Section 11.3	20 Townsend Section 11.4	21 No Class (Thanks-giving Break)	22 No Class (Thanks-giving Break)	23 No Class (Thanks-giving Break)	24/25
13 WEEK	26 Hour Exam #3 Chapters 7,9,10	27 Townsend Section 11.5	28 Townsend Section 11.6	29 Problem Presentations Chapter 11	30 Townsend Section 12.1	
					Chapter 11 Homework Due	

DECEMBER 2018

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SAT/SUN
						1/2
14	3 Townsend Section 12.2	4 Townsend Section 12.3	5 Townsend Sections 12.4- 12.5	6 Problem Presentations Chapter 12	7 Townsend Section 13.1	8/9
WEEK					Chapter 12 Homework Due	C in CC
15	10 Townsend Section 13.2	11 Hour Exam #4 Chapters 11-12	12 Townsend Section 13.3	13 Townsend Sections 13.4- 13.5	14 Final Exam Review	15/16
WEEK					Chapter 13 Homework Due	
	17 Final Exam (3:30-5:30 pm)	18	19	20	21	22/23
	24	25	26	27	28	29/30