

PHY390 Quantum Mechanics

Gustavus Adolphus College Fall 2017

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

Recommended - *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:** Frequently 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	7.5%
	In-Class Problem Presentations	7.5%
	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) 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 Disability Services Coordinator, 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 Disability Services as early as possible. Disability Services (<https://gustavus.edu/advising/disability/>) is located in the Advising and Counseling Center. Disability Services Coordinator Laurie Bickett (lbickett@gustavus.edu or x6286) can provide further information.
11. **Help for Students Whose First Language is not English:** Support for English Language Learners (ELL) and Multilingual students is available via the College's ELL Support staff person, Andrew Grace (agrace@gustavus.edu or x7395). He can meet individually with students to consult about academic tasks and to help students seek other means of support. The ELL Support person can also consult with faculty members who have ELL and multilingual students enrolled in their classes. The College's ELL staff person can provide students with a letter to a professor that explains and supports academic accommodations (i.e. additional time on tests, additional revisions for papers). Professors make decisions based on those recommendations at their own discretion. In addition, ELL and multilingual students can seek help from peer tutors in the Writing Center.

SEPTEMBER 2017

SUBJECT Quantum Mechanics

Fall 2017

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SAT/SUN
					1	2/3
	notes					
WEEK 1	4	5 Classes begin; Syllabus; Introduction	6 Townsend Sections 1.1-1.2	7 Townsend Sections 1.3-1.4	8 Townsend Sections 1.5-1.6	9/10
	notes					
WEEK 2	11 Problem Presentations Chapter 1	12 Townsend Sections 2.1-2.2	13 Townsend Sections 2.3-2.4	14 Townsend Sections 2.5-2.6	15 Townsend Sections 2.7-2.8	16/17
	notes	Chapter 1 Homework Due				
WEEK 3	18 Problem Presentations Chapter 2	19 Townsend Sections 3.1-3.2	20 Townsend Sections 3.3-3.4	21 Townsend Sections 3.5-3.6	22 Townsend Sections 3.7-3.8	23/24
	notes	Chapter 2 Homework Due				
WEEK 4	25 Problem Presentations Chapter 3	26 Townsend Sections 4.1-4.2	27 Townsend Sections 4.3-4.4	28 Townsend Section 4.5	29 Hour Exam #1 Chapters 1-3	30
	notes	Chapter 3 Homework Due				

OCTOBER 2017

SUBJECT Quantum Mechanics

Fall 2017

MONDAY

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

SAT/SUN

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

NOVEMBER 2017

SUBJECT Quantum Mechanics

Fall 2017

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SAT/SUN
WEEK 9			1 Townsend Sections 7.9-7.11	2 Problem Presentations Chapter 7	3 Townsend Sections 9.1-9.2	4/5
	notes				Chapter 7 Homework Due	
WEEK 10	6 Townsend Sections 9.3-9.4	7 Townsend Sections 9.5-9.6	8 Townsend Sections 9.9-9.10	9 Problem Presentations Chapter 9	10 Townsend Sections 10.1- 10.2	11/12
	notes				Chapter 9 Homework Due	
WEEK 11	13 Townsend Section 10.2	14 Townsend Section 10.3	15 Townsend Section 10.4	16 Townsend Sections 10.5- 10.6	17 Problem Presentations Chapter 10	18/19
	notes					
WEEK 12	20 Townsend Sections 11.1- 11.2	21 Townsend Sections 11.3- 11.4	22 No Class: Thanksgiving Break	23 No Class: Thanksgiving Break	24 No Class: Thanksgiving Break	25/26
	notes Chapter 10 Homework Due					
WEEK 13	27 Hour Exam #3 Chapters 7,9,10	28 Townsend Section 11.5	29 Problem Presentations Chapter 11	30 Townsend Section 12.1		
	notes			Chapter 11 Homework Due		

DECEMBER 2017

SUBJECT Quantum Mechanics

Fall 2017

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SAT/SUN
WEEK 13					1 Townsend Section 12.2	2/3
WEEK 14	4 Townsend Section 12.3	5 Townsend Sections 12.4- 12.5	6 Problem Presentations Chapter 12	7 Townsend Section 13.1 Chapter 12 Homework Due	8 Townsend Sections 13.2- 13.3	9/10
WEEK 15	11 Hour Exam #4 Chapters 11-12	12 Townsend Section 13.4-13.5	13 Final Exam Review	14 No Class: Reading Day	15 Final Exam: 10:30 AM – 12:30 PM	16/17
	18	19	20	21	22	23/24
	25	26	27	28	29	30 31