

**Physics 652: Quantum Mechanics  
Syllabus - Spring 2021**

**CRN: 34945, F01**

**Lecture:** MWF 1:00-2:00 PM, REIC 207

**Instructor:** Ataur R. Chowdhury

**Office:** REIC 118

**Office Hours:** MW 4:00-5:30 pm, and any other time I am in my office.

**Contact:** Phone (907) 474-6109  
Fax (907) 474-6130  
Email archowdhury@alaska.edu

**Prerequisites:** .39 lp0000912 5physics 65

**Physics 652: Quantum Mechanics**  
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# Physics 652: Quantum Mechanics

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and ask me for help. On the average, 5-8 problems will be assigned on most Fridays. The homework will be due back at the beginning of class the following Friday. **NO LATE HOMEWORK WILL BE ACCEPTED. NO EXCEPTIONS** (barring emergencies and extreme situations). The homework will be posted on the blackboard, and your solutions need to be submitted on the blackboard.

Group work is extremely effective in achieving a greater understanding of the subject material, and it is highly encouraged for solving problems. For additional help with the homework the students are most welcome to consult the instructor during the office hour or any other time by prior appointment. Any homework you submit should reflect your own best effort. **Copying of homework from your friend or any online sources is absolutely not acceptable and will**

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Total 100%

The final grading for this course will be based on a curve. For a given score, your letter grade will not be lower than what it would be expected based on standard grading scale (90-100 = A, 80-90 = B, etc.). Allowed grades are limited to letter grades A,B,C,D,F,I,BN, and no plus-minus grades will be given for this course.

Incomplete Grade Policy: “The letter “I” (Incomplete) is a temporary grade used to indicate that the student has satisfactorily completed (C or better) the majority of work in a course but for personal reasons beyond the student’s control, such as sickness, has not been able to complete the course during the regular semester. Negligence or indifference are not acceptable reasons for an “I” grade.”

## **Academic Honesty**

UAF expects and requires academic honesty from all members of the University community, and takes any act of plagiarism and cheating seriously. It is expected that all assignments, including homework and reports, that are turned in for this course must be the original work of the individual student. Failure to comply with this policy will result in penalty as stipulated under UAF regulations.

## **Student Protections and Services:**

COVID-19 Essentials:

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UA is an AA/EO employer and educational institution and prohibits illegal discrimination against any individual: [alaska.edu/nondiscrimination](http://alaska.edu/nondiscrimination).

Services:

**Effective communication:** Students who have difficulties with oral presentations and/or writing are strongly encouraged to get help from the UAF Department of Communication's Speaking Center (907-474-5470, [speak@uaf.edu](mailto:speak@uaf.edu)) and the UAF English's Department's Writing Center (907-474-5314, Gruening 8th floor), and/or CTC's Learning Center (604 Barnette st, 907-455-2860).

### Disabilities Services

The UAF Office of Disability Services implements the Americans with Disabilities Act (ADA), and insures that UAF students have equal access to the campus and course materials. Any student who may need assistance with disabilities, should feel free to contact the instructor or directly to insm0 g -47(in sm0 g -47(in sm0 g -4 insf(bil)-he )-47.6 m0 g -47(in sm0 g -4 insf(bil)-he )-47.f 0 0 1 8 0

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## Tentative Schedule

### Lecture, Reading, Paper and Exam

<u>Week</u>	<u>Date</u>	<u>Topics</u>	<u>Reading Assignment</u>
1	1/11-1/15	angular momentum in two and three dimensions	Shankar chapter 12
2	1/18-1/22	Hydrogen atom, comparison with experiments <b>Civil Rights Day 1/18 (no class)</b>	Shankar chapter 13 Shankar chapter 13
3	1/25-1/29	many electron atoms, periodic table	Shankar chapter 13
4	2/1-2/5	kinematics of spin, rotational operators	Shankar chapter 14
5	2/8-2/12	spin dynamics, EPR, Stern-Gerlach experiment <b>Outline for paper due Monday</b>	Shankar chapter 14
6	2/15-2/19	addition of angular momenta, Clebsch_Gordon coefficients,  <b>Midterm Friday 2/19</b>	Shankar chapter 15
7	2/22-2/26	Approximation methods, variational principle,	Shankar chapter 16
8	3/1-3/5	WKB approximation, Time-independent perturbation	Shankar chapter 16 Shankar chapter 17
9	3/8-3/12	degenerate perturbation with examples	Shankar chapter 17
10	3/15-3/19	time-dependent perturbation, first order approximation	Shankar chapter 18
11	3/22-3/		

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12	3/29-4/2	one dimensional scattering, time-dependent Born dependent Born approximation	Shankar chapter 19
13	4/5-4/9	time-independent Born approximation, partial wave expansion <b>Paper due this Friday</b>	Shankar chapter 19
14	4/12-4/16	free particle Dirac	

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