Professor  
Dr. Seyda Ipek (pronounced Shae-duh E-peck)  
3348 HP, seydaipek@cunet.carleton.ca  
Pronouns: she/her  
Student hours: Tue and Thu 10.30-11.30am or by appointment

Teaching Assistant  
Carlos Henrique de Lima  
carloshenriquedelima@cmail.carleton.ca  
Pronouns: he/him  
Student hours: By appointment

First and Last day of class: Sep 8 - Dec 10, 2021 (see below for detailed schedule)

Class website: Brightspace


What you will learn: Fundamental postulates of quantum mechanics, their mathematical description and application to 1D systems with various potentials, e.g. Delta function, harmonic oscillator, operator methods and how to apply it to solve systems involving angular momentum and spin.

Course Assessment

- **Homeworks (40%)** There will be 6-7 problem sets. They will be given out on a Monday and will be collected the following Monday. Late homeworks will not be accepted without a reasonable excuse. You are encouraged to work with others, but the work you turn in must be yours. Homework is a very important part of your learning. You should use the office hours or contact me if you need help. Read the Homework section of the course webpage for more detailed info.
- **Midterm (20%)** There will be one midterm, tentatively scheduled for Oct 20 during class time.
- **Final (40%)** The final exam will be given during the finals week.

Please make yourselves familiar with the Department of Physics academic policies:  
https://research.physics.carleton.ca/current-undergraduate-students/academic-policies

Deferred final exams will be permitted for documented reasons (illness, injury or other extraordinary circumstances beyond the student’s control). For more information, please see Section 4 of the Academic Regulations of the University:  
http://calendar.carleton.ca/undergrad/regulations/academicregulationsoftheuniversity/

Academic Accommodations

Write to me with any requests for academic accommodation due to pregnancy or religious obligations during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details visit the Equity Services website:  
http://www2.carleton.ca/equity/

The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities, psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder, Autism Spectrum Disorders, chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of the term, and no later than two weeks before the first in-class scheduled exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made.
## Tentative Schedule

<table>
<thead>
<tr>
<th>Week 1</th>
<th>Sep 8, Wed</th>
<th><strong>Welcome!</strong> Review of syllabus, introductions, Schrödinger equation, particle in a box</th>
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| Week 2 | Sep 13, Mon  
Sep 15, Wed | The potential barrier, WKB approximation, tunneling |
| Week 3 | Sep 20, Mon: Quiz due  
Sep 22, Wed: *Last day to change courses or sections (including auditing) for fall term.* | Delta function potential, the harmonic oscillator |
| Week 4 | Sep 27, Mon: HW1 due  
Sep 29, Wed  
*Sep 30, Thu: Last day to withdraw from fall term and fall/winter courses with a full fee adjustment.* | Wave mechanics, observables, vector spaces and operators |
| Week 5 | Oct 4, Mon: HW2 due, course survey due  
Oct 6, Wed  
*Oct 8, Fri: Dec examination schedule available online.* | Operator methods, projection operator |
| Week 6 | Oct 11, Mon: **Statutory holiday, no class**  
Oct 13, Wed | The energy spectrum of the harmonic oscillator, the time dependence of operators |
| Week 7 | Oct 18, Mon: HW3 due  
Oct 20, Wed: Midterm | **Review**  
Midterm |
| Week 8 | Oct 25, Mon: Fall break, no class  
Oct 27, Wed: Fall break, no class | *Have a nice break!* |
| Week 9 | Nov 1, Mon  
Nov 3, Wed | Angular momentum |
| Week 10 | Nov 8, Mon  
Nov 10, Wed  
*Nov 12, Fri: Last day to request Formal Examination Accommodation Forms for December examinations to the PMC* | 3-dimensional potentials, the hydrogen atom |
| Week 11 | Nov 15, Mon: HW4 due  
Nov 17, Wed | Matrix representation of operators |
| Week 12 | Nov 22, Mon: HW5 due  
Nov 24, Wed | Spin |
| Week 13 | Nov 29, Mon: HW6 due  
Dec 1, Wed | Spin, Entanglement |
| Week 14 | Dec 6, Mon: HW7 due  
Dec 8, Wed  
*Dec 10, Fri: Monday schedule, Last day of class* | Time-independent perturbation theory  
**Review** |
| Week 14 | Dec 11–23: *Final examinations* | *Good luck!* |