Quantum Mechanics I – Physics 701/7010 – GWPI – Fall 2016

Lecturer: Jim Martin, Physics Building, UW, Room 357
phone: 519–888–4567 Ext. 33201
e-mail: jddmartin@uwaterloo.ca
web: http://science.uwaterloo.ca/~jddmarti/
Teaching Assistant: Mária Kieferová
e-mail: m2kieferova@uwaterloo.ca

Textbook: "Modern Quantum Mechanics, 2nd Edition", J. J. Sakurai and J. Napolitano
Addison Wesley, ISBN 978-0-8053-4291-4

A recommended supplementary text for this course is Gottfried and Yan's *Quantum Mechanics: Fundamentals*, 2nd ed., Springer, ISBN 978-0387220239. Both of these books and some additional references will be put on reserve at the libraries.

Course Content (and corresponding chapters of the textbook):

1. review of basic formalism (Chapter's 1 and 2).
2. angular momentum, coupling of momenta, Wigner-Eckart theorem (Chapter 3).
3. symmetry (Chapter 4).
4. approximation methods (Chapter 5 and Chapter 2 [for WKB] + supplementary material)
5. time-dependent solutions (Rabi solution) and time-dependent perturbation theory (Chapter 5).
6. scattering (Chapter 6 + supplementary material).
7. quantization of the electromagnetic field (Chapter 7 + supplementary material).
8. introduction to one particle relativistic wave equations (Chapter 8 + supplementary material).

You will also be responsible for material that are prerequisites for this course including material that we do not explicitly cover in the lectures. If you need a brush-up on undergraduate QM, I recommend Griffiths' *Introduction to Quantum Mechanics* and/or Shankar's *Principles of Quantum Mechanics*.

Course web-site: http://learn.uwaterloo.ca/
Both Waterloo and Guelph students should have access shortly. Course communication will be by e-mail through your Learn account. Make sure you check this — or forward to an account you do check.

Course grading: This course will have $n \approx 6$ assignments. Your final grade will be the highest of:

$$\left(0.5 \times \frac{i}{n}\right) \times \text{average of highest } i \text{ assignments} + \left(1.0 - 0.5 \times \frac{i}{n}\right) \times \text{final exam grade},$$

where $i = 0, 1, ..., n-1, n$.

The first assignment — a brief survey — is due next Friday, August 16th:
https://goo.gl/forms/34coo5eP3lCnD6DE3

The final exam will be on Thursday, Dec. 8th, 2:30-5:30pm in the **Main** link room at UW.

In certain circumstances it may be necessary to hand in your assignment electronically (pdf greatly preferred). In these cases we require that a hard-copy of your assignment be sent to us within a *reasonable* amount of time (i.e. forwarded by mail the same day, or shortly after).

UW students should be aware of Policy 71, *Student Discipline*:
https://uwaterloo.ca/secretariat-general-counsel/policies-procedures-guidelines/policy-71
and Policy 72, *Student Appeals*:
https://uwaterloo.ca/secretariat-general-counsel/policies-procedures-guidelines/policy-72
Guelph students should be aware of similar relevant policies.

Discussion between students regarding assignments is encouraged. However, **under no circumstances** share your written solutions, or make use of previous year's solutions or solution manuals.