

## Quantum Mechanics I (PHYS 3021)

### List of Textbooks/Reference Books

See books reserved under Quantum Mechanics I (PHYS3021) and Applied Quantum Mechanics (PHYS3022). See *homepage of course webpage for links* to the two lists.

There are three groups of books relevant to your QM learning. There are the formal *Quantum Mechanics* textbooks. They give a more formal treatment of the subject and thus are a bit more mathematical. There are the *Modern Physics* or *Quantum Physics* textbooks that approach quantum mechanics with a more physical sense viewpoint. They are good for students who want to first know what QM wants to do, what it can do and what it cannot do. The last group of books provides help to those who want to pick up piece of necessary mathematics for learning QM. All the books listed here can be found in the University Library.

*Not to bias one group over another, they are listed side-by-side. They are equally good.*

<b><i>Quantum Mechanics textbooks (a sample)</i></b>	<b><i>Quantum Physics/Modern Physics textbooks (a sample)</i></b>
<ul style="list-style-type: none"><li>● David J. Griffiths, <i>Introduction to Quantum Mechanics</i> (any edition will do)</li><li>● Alastair M. Rae, <i>Quantum Mechanics</i> (any edition will do) (a cute little book that covers most undergraduate QM)</li><li>● Richard L. Liboff, <i>Introductory Quantum Mechanics</i> (nicely written by a Cornell author that covers all necessary undergraduate QM)</li><li>● Stephen Gasiorowicz, <i>Quantum Physics</i> (a book that has more quantum mechanics than other books of a similar title)</li><li>● Walter Greiner, <i>Quantum Mechanics</i> (a book in the Greiner's series, many worked examples)</li></ul>	<ul style="list-style-type: none"><li>● J.R. Taylor, C.D. Zafiratos, M.A. Dubson, <i>Modern Physics for Scientists and Engineers (2<sup>nd</sup> or other edition)</i></li><li>● Randy Harries, <i>Modern Physics</i></li><li>● R.A. Serway, C.J. Moses, C.A. Moyer, <i>Modern Physics</i></li><li>● K. Krane, <i>Modern Physics</i></li><li>● J. Bernstein, P.M. Fishbane, S. Gasiorowicz, <i>Modern Physics</i></li><li>● Ronald Gautreau, <i>Schaum's outline of theory and problems of modern physics</i> (a problem book, perfect for those who want to read worked examples and prepare for GRE subject test)</li></ul>

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| <ul style="list-style-type: none"> <li>● Amnon Yariv, <i>An introduction to the theory and applications of quantum mechanics</i> (another cute short book that covers the necessary QM for students in applied physics and materials science)</li> <li>● Donald A. McQuarrie, <i>Quantum Chemistry</i> (a wonderful book that teaches quantum mechanics with great clarity assuming no background. It covers all undergraduate-level atomic and molecular physics, and more.)</li> <li>● B.H. Bransden and C.J. Joachain, <i>Quantum Mechanics</i> (covers all QM and formally, and more)</li> <li>● 曾謹言 量子力學導論 (a short book) and 量子力學 (graduate level)</li> </ul> |  |
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### ***Practical Books for Mathematical Skills (a sample)***

Don't let mathematics hinder your QM learning. The subject is more physics than math. Here are a few practical texts that you can pick up pieces of mathematics quickly and painlessly.

- E. Steiner, *The Chemistry Maths Book* (Oxford Science Publications 1996) [Covers all mathematics needed for a chemistry degree, thus covers math skills needed for physical chemistry for which quantum chemistry is a part. Each topic is covered in only a few pages. Probably on reserve in UL (under PHYS4031). Perfect for those who only want to know how to use math and afraid of knowing the detail!]
- L. Lyons, *All you wanted to know about Mathematics but where afraid to ask* Volumes 1&2 (Cambridge U Press) [Forgot what complex numbers are about or what normal modes are, you can find a friendly and often insightful and physical discussions in these two volumes. Perfect for those who are afraid of abstract math discussions but want to learn a topic more completely than in *The Chemistry Maths Book*.]
- K.F. Riley, M.P. Hobson, S.J. Bence, *Mathematical Methods for Physics and Engineering* (2nd edition) (Cambridge Univ. Press 2002) (A low-price edition is available in Mainland). [Finally, here is a serious mathematical methods book of over 1000 pages.]