

The Chinese University of Hong Kong

Department of Physics

2011-12 1st Term Textbooks and References List

PHYS2011	Textbooks and references of PHY2001 & PHY2004; and the selected articles available in the Download Area.
PHYS2041	Notes will be provided.
PHYS4011	None
PHYS1001	<p>Textbook(s) R Resnick, D Halliday, and J Walker, Fundamentals of Physics, 7th ed., John Wiley & Sons, 2005.</p> <p>References John D. Cutnell, et al, Physics, 7th edition, John Wiley & Sons, 2007 R. P. Feynman, et al, Lectures on Physics, Addison Wesley, 1977</p>
PHYS2001	<p>Textbook(s) R Resnick, D Halliday and K S Krane, "Physics", Vol 1, 5th ed, John Wiley & Sons, 2002.</p> <p>Reference(s) D Kleppner and R J Kolenkow, "An Introduction to Mechanics", McGraw-Hill, 1973, Academic Press, 1992.</p>
PHYS2004	<p>Reference(s) G Stephenson, "Mathematical Methods for Science Students", Prentice Hall, latest ed. Mary L Boas, "Mathematical Methods in the Physical Sciences", Wiley, latest ed. W E Boyce and R C DiPrima, "Elementary Differential Equations and Boundary Value Problems", New York: J. Wiley, latest ed.</p>
PHYS2351	<p>Reference(s) L. Nyhoff and S. Leestma, Introduction to Fortran 90 Programming (Prentice Hall 1999). T.M.R. Ellis, I.R. Philips, and T.M. Lahey, Fortran 90 Programming (Addison-Wesley 1994). W.H. Press, S.A. Teukolsky, W.T. Vetterling, and B.P. Flannery, Numerical Recipes in FORTRAN: the Art of Scientific Computing, 2nd ed (Cambridge University 1992). P.L. DeVries, A first course in computational physics (John Wiley & Sons 1994) J.H. Mathews, Numerical methods for computer science, engineering, and mathematics (Prentice Hall 1992).</p>
PHYS2400	<p>Reference(s) Physical Biology of the Cell, R. Phillips, J. Kondev, J. Theriot (Garland Science 2009) Biological Physics: Energy, Information, Life, Philip Nelson, W H Freeman & Co; (2003)</p> <p>Web Resources I shall link the lecture notes, homework and relevant materials online. You may find useful materials/links here: Biophysics Educational Resources On-Line, Biophysical Society:</p>
PHYS2811	<p>Reference(s) (reserved at University Library) L. Kirkup, Data Analysis with Excel, (Q180.55S7K57 2002) (highly recommended) John R. Taylor, An introduction to error analysis: the study of uncertainties in physical measurements (QA275.T38 1982) L. Lyons, A practical guide to Data analysis for physical science students (QC33L9 1991) D.C. Baird, "Experimentation" (QC39B17 1995)</p>
PHYS3011	<p>Textbook(s) J.B. Marion and S.T. Thornton, Classical Dynamics of Particles And Systems (Fifth Edition)</p>

	<p>Reference(s) A P Arya, Introduction to Classical Mechanics, Prentice-Hall, 1990 QC125.2.A79 T W B Kibble, Classical Mechanics, 3rd ed, Longman, 1985 C Kittel, Mechanics, Berkeley Physics Course, Vol. 1, 2nd ed, McGraw-Hill, 1973 QC21 .B4445 v.1 1973 C Kittel, Mechanics, Berkeley Physics Course, Vol. 2, 2nd ed, McGraw-Hill, 1973 D Kleppner & R J Kolenkow, An Introduction to Mechanics, McGraw-Hill, 1973 QA805.K62 1973 K R Symon, Mechanics, 3rd ed, Addison-Wiley, 1971 QC125.S98 1971 J B Marion and S T Thornton, Classical Dynamics of Particles & Systems, 3rd ed, Harcourt Brace Jovanovich Inc, 1988 QA845.M38 1988</p>
PHYS3041	<p>Textbook(s) D. J. Griffiths, "Introduction to electrodynamics", 3rd Edition, Prentice Hall, 1999.</p> <p>Reference(s) E. M. Purcell, "Electricity and Magnetism", 2nd Edition, McGraw-Hill, 1985. R. P. Feynman, R. B. Leighton and M. Sands, "The Feynman Lectures on Physics, Vol. II", Addison-Wesley, 1965. J. Reitz, F. Milford and R. Christy, "Foundations of electromagnetic theory", 4th Edition, Addison-Wesley, 1993.</p>
PHYS3201	<p>Textbook(s) (Available in University Bookstore for Purchase and also in Reserve in UL) R. Harris, <i>Modern Physics</i>, 2nd Ed. (Pearson International Edition). Pearson Addison Wesley (2008).</p> <p>Reference(s) (Available in Reserve in UL) [TZD] J.R. Taylor, C.D. Zafiratos and M.A. Dubson, <i>Modern Physics for Scientists and Engineers</i>, 2nd Ed. (Prentice-Hall 2004). [SMM] R.A. Serway, C.J. Moses, and C.A. Moyer, <i>Modern Physics</i>, 3rd Ed. (Thomson Learning 2005). S. Gasiorowicz, <i>Quantum Physics</i>, 2nd Ed. (John Wiley & Sons 1996). A. Beiser, <i>Concepts of Modern Physics</i>, 5th ed. (McGraw-Hill 1995) K. Krane, <i>Modern Physics</i>, 2nd ed. (Wiley 1996) L. Lyons, <i>All you wanted to know about Mathematics but were afraid to ask --- Mathematics for science students</i>, Vols. 1 and 2 (Oxford University Press 1995).</p>
PHYS3601	<p>Reference(s) M. L. Boas, <i>Mathematical Methods in the Physical Sciences</i>, (2nd ed, Wiley 1983). G. Arfken, <i>Mathematical Methods for Physicists</i>, (4th ed, Academic Press, 1995). G. Stephenson, <i>Mathematical Methods for Science Students</i>, (2nd ed, ELBS/Longman, 1973). P.R.Wallace, <i>Mathematical Analysis of Physical Problems</i>, (Dover, 1984). F.B. Hildebrand, <i>Advanced Calculus for Application</i>, (2nd ed, Prentice-Hall, 1976). E. Kreyszig, <i>Advanced Engineering Mathematics</i>, (9th ed, Wiley, 2006). C.C. Lin and L.A. Segel, <i>Mathematics Applied to Deterministic Problems in the Natural Sciences</i>, (SIAM, 1988). J. Kevorkian, <i>Partial Differential Equations: Analytical Solution Techniques</i>, (2nd ed, Springer, 2000).</p>
PHYS3811	<p>Reference(s) L. Kirkup, <i>Data analysis with Excel: an introduction for physical scientists</i>, Cambridge University Press. [Q180.55S7K57 2002] N. C. Barford, <i>Experimental Measurements: Precision, Error, and Truth</i>, 2nd ed. Wiley 1985. [QA275E27 1985] P. R. Bevington and D. K. Robinson, <i>Data Reduction and Error Analysis for the Physical</i></p>

	<p>Sciences, 2nd ed. McGraw-Hill 1992. [QA278.B48 1992] N. H. Cook and E. Rabinowicz, Physical Measurement and Analysis, Addison-Wesley 1963 [QC39 C 595] E. M. Pugh and G. H. Winslow, The Analysis of Physical Measurements, Addison Wesley, 1966 [QC39.P8] Wikipedia.org</p>
PHYS4221	<p>Reference(s) D.J. Griffiths, Introduction to Quantum Mechanics, 2nd ed. (Prentice-Hall, 2005) B.H. Bransden and C.J. Joachain, Introduction to Quantum Mechanics (Longman, 1989) F. Schwabl, Quantum Mechanics, 2nd ed. (Springer, 1995) R.L. Liboff, Introductory Quantum Mechanics, 2nd ed. (Addison-Wesley, 1992) D.A. Park, Introduction to the Quantum Theory, 3rd ed. (McGraw-Hill, 1992) L.E. Ballentine, Quantum Mechanics: a modern development (World Scientific, 1998) A. Yariv, An Introduction to Theory and Applications of Quantum Mechanics, (Wiley, 1982) E. Merzbacher, Quantum Mechanics, 3rd ed. (Wiley, 1998) L.I. Schiff, Quantum Mechanics, 3rd ed. (McGraw-Hill, 1968) K. Gottfried, Quantum Mechanics, Vol. 1: Fundamentals (Benjamin, 1979) R. Shankar, Principles of Quantum Mechanics, 2nd ed. (Plenum Press, 1994) H. Kroemer, Quantum Mechanics for engineers, materials science and applied physics (Prentice-Hall, 1994) J.J. Sakurai, Modern Quantum Mechanics, rev. ed. (Addison-Wesley, 1994) L.D. Landau and E.M. Lifshitz, Quantum Mechanics, Non relativistic Theory, 3rd ed. (Pergamon Press, 1977) P.A.M. Dirac, The Principles of Quantum Mechanics, 4th ed. (Oxford University Press, 1967)</p>
PHYS4260	<p>Textbook(s) There will be hand-written lecture notes. Students should download classnotes and read them prior to attending lectures.</p> <p>There are many books on statistical mechanics or statistical physics or statistical thermodynamics. The contents are quite standard. However, I could not find one that is reasonably priced and fits to our course perfectly. Therefore, I will NOT select a textbook. Instead, I would suggest several reference books. These and other books are put on reserve in the reserved-book section in the University Library. There are many "new" statistical physics textbooks published in recent years, as its relevance has been increasingly recognized even at the undergraduate level. Some of these books are available in E-book form, as marked below.</p> <p>Reference(s) F. Mandl, "Statistical Physics", 2nd ed. John Wiley & Sons. [QC174.8.M27 1988] (A standard textbook for final year students in the British university system.)</p> <p>Tony Guenault, "Statistical physics" 2nd ed. Chapman & Hall. [QC174.8 .G84 1995] (A short book that uses probably the simplest approach in getting the key results in equilibrium statistical physics. Good for students learning the subject for the first time.)</p> <p>D.H. Trevana, "Statistical Mechanics: An introduction", Ellis Horwood [QC174.8.T63 1993] (Same approach as Guenault and similar in coverage. Very practical.)</p> <p>W.G.V. Rosser, "An introduction to statistical physics", Ellis Horwood. [QC174.8.R67] (Very detailed discussions on how to develop the theory from the basics. The starting point is similar to the book by Guenault, but the book takes the readers farther. Excellent discussion on the</p>

	<p>connections from statistical mechanics and thermodynamics.)</p> <p>Harald J. W. Muller-Kirsten, "Basics of Statistical Physics – A Bachelor Degree Introduction", World Scientific 2010. The chosen topics are exactly those in our course. A strong point of the book is that there are many worked examples.</p> <p>L. G. Benguigui, "Statistical Mechanics for Beginners", World Scientific 2010. [QC174.8 B46 2010] A very well written new stat mech textbook for first-time learners. We will cover all the topics in this book. For some topics, our treatment will be deeper. The strong points are: the book is short (147 pages) and the simplest/direct approach is chosen.</p> <p>S. J. Blundell and K. M. Blundell, "Concepts in Thermal Physics", Oxford University Press 2006 [QC254.2 B58 2006] (Another very well written modern book that covers both thermodynamics and statistical physics at the undergraduate level. The topics are covered in short (but many) chapters, allowing a reader to learn a particular topic within 15 pages or so. A strong point is the part on special topics (mostly applications of statistical mechanics), including shock waves, stars, earth's atmosphere, etc. <i>E-book version is available via UL website.</i>)</p> <p>C. Hermann, "Statistical Physics: Including Applications to Condensed Matter", Springer 2005. (We will cover 90% of the topics in this book. There are solved problems as examples. <i>E-book version is available via UL website.</i>)</p> <p>R. Bowley and M. Sanchez, "Introductory Statistical Mechanics", Oxford University Press. [QC311.5. B684 1999] (2 copies reserved in library) (The level of presentation fits to a standard undergraduate course. The coverage is slightly more than that in our course.)</p> <p>C. Kittel and H. Kroemer, "Thermal physics" 2nd ed. WH Freeman. [QC311.5 .K52 1980] (A standard undergraduate textbook in US universities.)</p> <p>F. Reif, "Fundamental of Statistical and Thermal Physics", McGrawHill. [QC175.R43] (Similar to Kittel and Kroemer.) A simpler version is F. Reif, "Statistical Physics", Berkeley Physics Course, Vol.5, McGrawHill. [QC21.4445 v.5].</p> <p>K. Huang, "Introduction to Statistical Physics", Taylor & Francis. [QC174.8.H82 2001] (This is a very interesting book. Only 270-page in length, the author gave a concise and precise introduction to the key ideas in statistical mechanics. Readers need to digest every sentence carefully. The discussions are quite deep in places. The lack of worked examples is a weak point of the book. The author wrote a classic textbook "Statistical Mechanics" [QC175.8.H8 1987] back in 1963, which gives a rigorous treatment on the subject at the graduate level.)</p> <p>D.J. Amit, "Statistical physics: an introductory course", World Scientific. [QC174.8.A45 1999] (An excellent book for self-learning written by an excellent author well known for his clarity. The author also wrote "Field Theory, the renormalization group, and critical phenomena" [QC173.4.C74A44 1984], from which many researchers learned how to study critical phenomena using field theoretical approaches.</p>
PHYS4460	<p>Reference(s)</p> <p>S Weinberg, Gravitation and cosmology: principles and applications of the general theory of relativity (Wiley) UL QC173.55.W47</p> <p>CW Misner, KS Thorne & JA Wheeler, Gravitation (Freeman) UL QC178.M57</p> <p>BF Schutz, A first course in general relativity (Cambridge) UL QC173.6.S38 1985</p>

PHYS4700	<p>Textbook(s) G.W. Hanson, "Fundamentals of Nanoelectronics", (Pearson, 2008) TK7874.8 .H37 2008 . D.A. McQuarrie "Quantum Chemistry", (University Science books, 1983) QD462.M26 . J.D. Joannopoulos, R. D. Meade, and J.N. Winn "Photonic crystals: molding the flow of light" (Princeton Univ, 1995) QC793.5.P427 J63 1995 . New edition can be free downloaded from http://ab-initio.mit.edu/book/. Handouts: copied from other books.</p> <p>Reference(s) J.H. Davies, "The Physics of Low-dimensional Semiconductors", (Cambridge University Press, 1998) QC611.8.L68 D39 1998 . V.V. Mitin, V.A. Kochelap and M.A. Stroschio "Quantum Heterostructures", (Cambridge University Press, 1999) QC611 .M665 1999 . R.L. Liboff, "Introductory Quantum Mechanics", 2nd ed. (Addison-Wesley, 1992) QC174.12.L52 1992 . R.H. Bube, "Electrons in Solids: An introductory Survey", 3rd ed. (Academic Press, 1992) QC176.B78 1992 .</p>
PHYS5330	<p>Reference(s) J H Moore, C C Davis and M A Coplan, Building Scientific Apparatus, a practical guide to design and construction, Addison-Wesley. A De Sa, Principles of Electronic Instrumentation, Edward Arnold. (TK7878.4.D4 1990) B E Jones, Instrumentation, Measurement and Feedback, McGraw-Hill. (TA165.J58 1990) G A Woolvet, Transducers in Digital Systems, Peter Peregrinus. (TJ223.TW66) J Allocca and A Stuart, Transducers: Theory and Application, Reston. (TJ223.T7A45) R P Pallas-Areny and J G Webster, Sensors and Signal Conditioning, Wiley, 1991. (TK7872.T6P25) A Roth, Vacuum Technology, 3rd ed., North-Holland, 1990. (TJ940.R63) R A Dunlop, Experimental Physics, Modern Methods, Oxford University Press, 1988. D. A. Bell, Operational Amplifiers Applications, Troubleshooting, and Design, Prentice Hall, 1990. (TK 7871.58 O6B45 1990) A F P Putten, Electronic Measurement Systems, Prentice Hall, 1988. (TK7878.P87) F R Dungan, Electronic Communications Systems, 2nd ed, Delmar, 1993. L P Huelsman, Active and Passive Analog Filter Design, McGraw-Hill, 1993. (TK7872.F5H797 1993) P E Johnson, H R Johnson and H P Moore, A Handbook of Active Filters, Prentice Hall, 1980. (TK7872.F5J65 1980). R J Schoenbeck, Electronic Communications Modulation and transmission, Merrill, 1992. (TK5102.5.S362 1992)</p>
PHYS5430	<p>Textbook(s) N. W. Ashcroft and N. D. Mermin, Solid State Physics, Holt, Rinehart and Winston, 1976. (A+M)</p> <p>Reference(s) C. Kittel, Quantum Theory of Solids, Wiley, 1963. (K) J. M. Ziman, Principles of the Theory of Solids, Cambridge University Press, 1972. (Z)</p>
PHYS5510	<p>Reference(s) M. Plischke and B. Bergersen, Equilibrium Statistical Physics, 2nd ed. (World Scientific, 1994). R. K. Pathria, Statistical Mechanics, 2nd Ed. (Elsevier, 2001). L. E. Reichl, A Modern Course in Statistical Physics (1998). S. K. Ma, Modern Theory of Critical Phenomena (Benjamin/Cummings, 1976). 李政道，統計力學(上海科學技術出版社，2006). S. Sachdev, Quantum Phase Transitions (Cambridge, 1999).</p>

PHYS5550	<p>Reference(s) C. Cohen-Tannoudji, J. Dupont-Roc, G. Grynberg: Photons, and Atoms. An Introduction to Quantum Electrodynamics (Wiley, New York 1989) C. Cohen-Tannoudji, J. Dupont-Roc, G. Grynberg: Atom-Photon Interactions (Wiley, New York 1992) M.O. Scully, M. S. Zubairy: Quantum Optics (Cambridge Univ. Press, Cambridge 1996) W. H. Louisell: Quantum Statistical Properties of Radiation (Wiley, New York 1973) P. Meystre, M. Sargent III: Elements of Quantum Optics (Springer, Berlin, Heidelberg 1999) D. F. Walls, G. J. Milburn: Quantum Optics (Springer, Berlin, Heidelberg 1994) R. Loudon: The Quantum Theory of Light (Oxford 2000) C. W. Gardiner: Quantum Noise (Springer, Berlin, Heidelberg 1991)</p>
PHYS5620	<p>Reference(s) Milton Ohring, "The Materials Science of Thin Films", Academic Press, TA418.9. T45 O47 1992. Donald L. Smith, "Thin-Film Deposition: Principles and Practice", McGraw-Hill, Inc., TA418.9. T45 S65 1995.</p>