

19.11: Bibliography

[1] SELECTION OF TEXTBOOKS ON CLASSICAL MECHANICS

[Ar78] V. I. Arnold, “*Mathematical methods of Classical Mechanics*”, 2nd edition, Springer-Verlag (1978)

This textbook provides an elegant and advanced exposition of classical mechanics expressed in the language of differential topology.

[Co50] H.C. Corben and P. Stehle, “*Classical Mechanics*”, John Wiley (1950)

This classic textbook covers the material at the same level and comparable scope as the present textbook.

[Fo05] G. R. Fowles, G. L. Cassiday, “*Analytical Mechanics*”. Thomson Brookes/Cole, Belmont, (2005)

An elementary undergraduate text that emphasizes computer simulations.

[Go50] H. Goldstein, “*Classical Mechanics*”, Addison-Wesley, Reading (1950)

This has remained the gold standard graduate textbook in classical mechanics since 1950. Goldstein’s book is the best graduate-level reference to supplement the present textbook. The lack of worked examples is an impediment to using Goldstein for undergraduate courses. The 3rd edition, published by Goldstein, Poole, and Safko (2002), uses the symplectic notation that makes the book less friendly to undergraduates. The Cline book adopts the nomenclature used by Goldstein to provide a consistent presentation of the material.

[Gr06] R. D. Gregory, “*Classical Mechanics*”, Cambridge University Press

This outstanding, and original, introduction to analytical mechanics was written by a mathematician. It is ideal for the undergraduate, but the breadth of the material covered is limited.

[Gr10] W. Greiner, “*Classical Mechanics, Systems of particles and Hamiltonian Dynamics*”, 2nd edition, Springer (2010). This excellent modern graduate textbook is similar in scope and approach to the present text. Greiner includes many interesting worked examples, as well as a reproduction of the Struckmeier[Str08] presentation of the extended Lagrangian and Hamiltonian mechanics formalism of Lanczos[La49].

[Jo98] J. V. José and E. J. Saletan, “*Classical Dynamics, A Contemporary Approach*”, Cambridge University Press (1998)

This modern advanced graduate-level textbook emphasizes configuration manifolds and tangent bundles which makes it unsuitable for use by most undergraduate students.

[Jo05] O. D. Johns, “*Analytical Mechanics for Relativity and Quantum Mechanics*”, 2nd edition, Oxford University Press (2005). Excellent modern graduate text that emphasizes the Lanczos[La49] parametric approach to Special Relativity. The Johns and Cline textbooks were developed independently but are similar in scope and approach. For consistency, the name “generalized energy”, which was introduced by Johns, has been adopted in the Cline textbook.

[Ki85] T.W.B. Kibble, F.H. Berkshire. “*Classical Mechanics, (5th edition)*”, Imperial College Press, London, 2004. Based on the textbook written by Kibble that was published in 1966 by McGrawHill. The 4th and 5th editions were published jointly by Kibble and Berkshire. This excellent and well-established textbook addresses the same undergraduate student audience as the present textbook. This book covers the variational principles and applications with minimal discussion of the philosophical implications of the variational approach.

[La10] O.L. De Lange and J. Pierrus, “*Solved Problems in Classical Mechanics*”, Oxford University Press, 2010. Presents both numerical and analytical solution of problems in classical mechanics.

[La49] C. Lanczos, “*The Variational Principles of Mechanics*”, University of Toronto Press, Toronto, (1949)

An outstanding graduate textbook that has been one of the founding pillars of the field since 1949. It gives an excellent introduction to the philosophical aspects of the variational approach to classical mechanics, and introduces the extended formulations of Lagrangian and Hamiltonian mechanics that are applicable to relativistic mechanics.

[La60] L. D. Landau, E. M. Lifshitz, “*Mechanics*”, Volume 1 of a *Course in Theoretical Physics*, Pergamon Press (1960)

An outstanding, succinct, description of analytical mechanics that is devoid of any superfluous text. This Course in Theoretical Physics is a masterpiece of scientific writing and is an essential component of any physics library. The compactness and lack of

examples makes this textbook less suitable for most undergraduate students.

[Li94] Yung-Kuo Lim, *“Problems and Solutions on Mechanics”* (1994)

This compendium of 408 solved problems, which are taken from graduate qualifying examinations in physics at several U.S. universities, provides an invaluable resource that complements this textbook for study of Lagrangian and Hamiltonian mechanics.

[Ma65] J. B. Marion, *“Classical Dynamics of Particles and Systems”*, Academic Press, New York, (1965)

This excellent undergraduate text played a major role in introducing analytical mechanics to the undergraduate curriculum. It has an outstanding collection of challenging problems. The 5th edition has been published by S. T. Thornton and J. B. Marion, Thomson, Belmont, (2004).

[Me70] L. Meirovitch, *“Methods of Analytical Dynamics”*, McGraw-Hill New York, (1970)

An advanced engineering textbook that emphasizes solving practical problems, rather than the underlying theory.

[Mu08] H. J. W. Müller-Kirsten, *“Classical Mechanics and Relativity”*, World Scientific, Singapore, (2008)

This modern graduate-level textbook emphasizes relativistic mechanics making it an excellent complement to the present textbook.

[Pe82] I. Percival and D. Richards, *“Introduction to Dynamics”* Cambridge University Press, London, (1982)

Provides a clear presentation of Lagrangian and Hamiltonian mechanics, including canonical transformations, Hamilton-Jacobi theory, and action-angle variables.

[Sy60] J.L. Synge, *“Principles of Classical Mechanics and Field Theory”*, Volume III/I of *“Handbuck der Physik”* Springer-Verlag, Berlin (1960).

A classic graduate-level presentation of analytical mechanics.

[Th04] S.T. Thornton, and J. B. Marion, *“Classical Dynamics of Particles and Systems”*, 5th edition. Brooks/Cole-Thomson Learning, New York, (2004)

Thornton has expanded the outstanding collection of challenging problems in this popular classical mechanics book.

[2] GENERAL REFERENCES

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