Chapter 0

Reference Materials

No one book contains all the relevant material. Here I list several resources, arranged by topic. My personal favorites are marked with a diamond ($\diamond$).

0.1 Dynamical Systems

$\diamond$ S. Strogatz, *Nonlinear Dynamics and Chaos* (Addison-Wesley, 1994)

$\diamond$ S. Neil Rasband, *Chaotic Dynamics of Nonlinear Systems* (Wiley, 1990)

$\diamond$ J. Guckenheimer and P. Holmes, *Nonlinear Oscillations, Dynamical Systems, and Bifurcations of Vector Fields* (Springer, 1983)

• E. A. Jackson, *Perspectives of Nonlinear Dynamics*, 2 vols. (Cambridge, 1991)

• A. J. Lichtenberg and M. A. Lieberman, *Regular and Stochastic Motion* (Springer, 1983)

• R. Z. Sagdeev, D. A. Usikov, and G. M. Zaslavsky, *Nonlinear Physics from the Pendulum to Turbulence and Chaos* (Harwood Academic, 1988)

• M. Lakshmanan and S. Rajasekar, *Nonlinear Dynamics : Integrability, Chaos, and Patterns* (Springer, 2003)

• H. G. Schuster and W. Just, *Deterministic Chaos*, 4th ed. (Wiley-VCH, 2005)

- M. Tabor, *Chaos and Integrability in Nonlinear Dynamics* (Wiley, 1989)

- E. Ott, *Chaos in Dynamical Systems*, 2nd ed. (Cambridge, 2002)

0.2   Hamiltonian Mechanics

⋄ G. M. Zaslavsky, *Hamiltonian Chaos and Fractional Dynamics* (Oxford, 2005)

⋄ J. V. José and E. J. Saletan, *Classical Dynamics : A Contemporary Approach* (Cambridge, 1998)

- V. I. Arnold, V. V. Kozlov, and A. I. Neishtadt, *Mathematical Aspects of Classical and Celestial Mechanics* (Springer, 2006)

- A. L. Fetter and J. D. Walecka, *Nonlinear Mechanics* (Dover, 2006)

- I. Percival and D. Richards, *Introduction to Dynamics* (Cambridge, 1982)

0.3   Differential Equations

⋄ D. Zwillinger, *Handbook of Differential Equations*, 3rd ed. (Academic Press, 1998)

⋄ A. H. Nayfeh, *Introduction to Perturbation Techniques* (Wiley, 1981)

⋄ C. M. Bender and S. A. Orszag, *Advanced Mathematical Methods for Scientists and Engineers* (Springer, 1999)

⋄ V. I. Arnold, *Ordinary Differential Equations* (MIT Press, 1973)

- V. I. Arnold, *Geometrical Methods in the Theory of Ordinary Differential Equations* (Springer, 1988)

- L. Perko, *Differential Equations and Dynamical Systems*, 3rd ed. (Springer, 2001)

- J. A. Sanders and F. Verhulst, *Averaging Methods in Nonlinear Dynamical Systems* (Springer, 1985).

0.4   Synchronization

◇ Y. Kuramoto, *Chemical Oscillations, Waves, and Turbulence* (Dover, 2003)

- A. Pikovsky, M. Rosenblum, and J. Kurths, *Synchronization : A Universal Concept in Nonlinear Sciences* (Cambridge, 2001)

0.5   Nonlinear Wave Equations

◇ G. B. Whitham, *Linear and Nonlinear Waves* (Wiley, 1999)

◇ A. Scott, *Nonlinear Science*, 2nd ed. (Oxford, 2003)

- E. Infeld and G. Rowlands, *Nonlinear Waves, Solitons, and Chaos* (Cambridge, 2000)

- R. Rajaraman, *Solitons and Instantons* (North-Holland, 1987)

- H.-K. Rhee, R. Aris, and N. R. Amundson, *First-Order Partial Differential Equations* (2 vols.) (Dover, 1986)

- L. I. Pismen, *Vortices in Nonlinear Fields* (Oxford, 1999)

0.6   Pattern Formation

◇ P. Manneville, *Instabilities, Chaos, and Turbulence* (Imperial College Press, 2004)

◇ D. Walgraef, *Spatio-Temporal Pattern Formation* (Springer, 1996)

- P. Manneville, *Dissipative Structures and Weak Turbulence* (Academic Press, 1990)

- L. M. Pismen, *Patterns and Interfaces in Dissipative Dynamics* (Springer, 2006)

- M. I. Rabinovich, A. B. Ezersky, and P. D. Weidman, *The Dynamics of Patterns* (World Scientific, 2000)

- R. Hoyle, *Pattern Formation : An Introduction to Methods* (Cambridge, 2006)

0.7   Biological Applications

◇ J. D. Murray, *Mathematical Biology*, (3rd ed., 2 vols.) (Springer, 2002)

- E. M. Izhikevich, *Dynamical Systems in Neuroscience* (MIT Press, 2007)

- L. Edelstein-Keshet, *Mathematical Models in Biology* (SIAM, 2005)

- J. Hofbauer and K. Sigmund, *Evolutionary Games and Population Dynamics* (Cambridge, 1998)

- M. A. Nowak, *Evolutionary Dynamics* (Harvard, 2006)