1. Netwon's laws, vectors, coordinates
2. Conservation of momentum, angular momentum and energy
3. Oscillations
4. Variations and Lagrange Equations
5. Noether's Theorem
6. Two body problems
7. Noninertial Frames
8. Rigid bodies
9. Coupled oscillators
10. Hamiltonian mechanics
11. Special relativity
12. Nonlinear Mechanics

The recommended books are:

-"Classical Mechanics" J.R. Taylor
-"Introduction to classical mechanics" D. Morin
-"Classical Dynamics of Particles and Systems" S.Thornton, J.B.Marion