Class	Major Topics	Textbook Reference
1 Mon. Sept. 11	• Introduction to PHY138: the structure of the course • Studying Physics • Doing well at University	None
2 Wed. Sept. 13	• Motion Diagrams ○ Example: projectile motion • Position, velocity, acceleration • Vectors • Problem solving • Units • Significant figures	Chapter 1 - **Concepts of Motion**
3 Mon. Sept. 18	• More about displacement, velocity, speed and acceleration • Using derivatives •  Introducing the integral sign • Free fall • Motion on an inclined plane	Chapter 2 - **Kinematics: The Mathematics of Motion** Omit subsection of §2.4: *A Little More Calculus: Integrals*
4 Wed. Sept. 20	• Vectors and scalars • Coordinate systems • Newton's 1st and 2nd Laws • Inertial reference frames • Free body diagrams	Chapter 3 - **Vectors and Coordinate Systems** Chapter 4 - **Force and Motion**
5 Mon. Sept. 25	• Equilibrium • Using Newton's 2nd Law • Mass and weight	Chapter 5 - **Dynamics I: Motion Along a Line** Omit §5.4 - Friction Omit §5.5 - Drag
6 Wed. Sept. 27	• Kinematics in Two Dimensions • Dynamics in Two Dimensions • Projectile motion •  ***Data and analysis of jumping frogs***.	Chapter 6 - **Dynamics II: Motion in a Plane** Omit §6.4 - Relative motion

7 Mon. Oct. 2	• Uniform circular motion • Circular orbits	Chapter 7 - **Dynamics III: Motion in a Circle** §7.1 - §7.4
8 Wed. Oct. 4	• Fictitious forces • Nonuniform circular motion --- • Action/reaction pairs • Ropes and pulleys •  ***Ballistocardiogram***	§7.5 - §7.6 --- Chapter 8 - **Newton's Third Law**
9 Wed. Oct, 11	• Impulse •  ***Damage caused to people in collisions*** •  ***Physics of a tennis serve*** • Conservation of momentum • Inelastic collisions • Angular momentum	Chapter 9 - **Impulse and Momentum**
10 Mon. Oct. 16	• Kinetic energy • Gravitational potential energy •  The gravitational field  • Hooke's Law for springs • Elastic collisions • Energy diagrams	Chapter 10 - **Energy** §10.1 - §10.7 Omit subsection of §10.6: *Using Reference Frames*
11 Wed. Oct. 18	• Work and kinetic energy •  ***More about jumping frogs*** • Conservative and non-conservative forces • Thermal energy • Conservation of energy • Power •  ***Basal metabolic rate***	Chapter 11 - **Work** §11.1 - §11.9

12 Mon. Oct. 23	• Rotation about the center of mass • Torque •  ***Forces on the hip and femur***	Chapter 13 - **Rotation of a Rigid Body** §13.1 - §13.3
13 Wed. Oct. 25	• Moment of inertia • Conservation of angular momentum • Rotational energy • Angular momentum of a rigid body	§13.4 - §13.7, §13,10 Omit §13.8 - *Rolling Motion* Include the *Angular Velocity Vector* subsection of §13.9; omit the rest of this section
14 Mon. Oct. 30	• Review for the test	All of the above.
15 Wed. Nov. 1	• Error analysis: a laboratory topic	Nothing from the textbook, but we will discuss *Significant Figures* from Class 2 in a different way.

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