1 Calculus

Definition of derivative and integral, equivalence of integral and antiderivative

Vectors and trigonometry, integration and differentiation of vectors

2 Kinematics

Definition of velocity and acceleration in one dimension

Relative velocity

Dogs in a square problem and dogs in a triangle problem

3 Forces

Newton's Laws

Initial position, velocity and forces determine motion

4 Statics

Special forces: tension and gravity

[Morin p 23] Hanging mass, block on a plane

$F/\sin\theta$ is constant

5 Dynamics

Atwood's machine

Gravitational acceleration is constant

6 Momentum

Impulse-momentum theorem

[Morin p 134 splitting mass]

7 Energy

[Feynman 4]

Forces depending only on x in one dimension - closed paths do zero work

Work done by a force

Force is the spatial derivative of potential energy - minimization

8   Collisions

9   SHM

10   Circular motion

Sliding block problem - forces, energy

Rigid body

Rotation