Classical Mechanics (Tatum)

Classical mechanics is the study of the motion of bodies (including the special case in which bodies remain at rest) in accordance with the general principles first enunciated by Sir Isaac Newton in his *Philosophiae Naturalis Principia Mathematica* (1687), commonly known as the *Principia*. 
2: Moments of Inertia

\[ \omega = \frac{\vec{V}}{\alpha} \]

\[ P = M\vec{\omega} \]

- 3: Systems of Particles

- 4: Rigid Body Rotation

- 5: Collisions
6: Motion in a Resisting Medium

7: Projectiles

8: Impulsive Forces

9: Conservative Forces
10: Rocket Motion

11: Simple and Damped Oscillatory Motion

12: Forced Oscillations

13: Lagrangian Mechanics
\[
\frac{dp}{dt} = -\frac{\partial H}{\partial q} \\
\frac{dq}{dt} = +\frac{\partial H}{\partial p}
\]

14: Hamiltonian Mechanics

- 15: Special Relativity

- 16: Hydrostatics

- 17: Vibrating Systems
18: The Catenary

19: The Cycloid

20: Miscellaneous

21: Central Forces and Equivalent Potential
22: Dimensions

Thumbnail: Proper Euler angles geometrical definition. The \(xyz\) (fixed) system is shown in blue, the \(XYZ\) (rotated) system is shown in red. The line of nodes (N) is shown in green. (CC BY 3.0; Lionel Brits).

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