Notation (Instructors may request alternate notation)

Symbol	Meaning
$t,\ \rho,\ \pi,\ e$	t time, ρ density, $\pi \approx 3.14159265358979323846$ $e \approx 2.71828182845904523536$
$g,\ G$	Gravitational constants: Earth $g \approx 9.80665\ \frac{\mathrm{m}}{\mathrm{s}^2}$ Universal $G \approx 6.673 \times 10^{-11}\ \frac{\mathrm{m}^3}{\mathrm{kg\,s}^2}$
$\mu_s,\ \mu_k,\ e_r$	Coefficient of static and kinetic friction. Coefficient of restitution.
$\frac{\partial y}{\partial x}\ \ \frac{\partial^2 y}{\partial x^2}$	First or second partial derivative of the scalar y with respect to the scalar x.
$\frac{dy}{dt}\ \ \dot{y}$	Ordinary time derivative of y.
$\frac{d^2y}{dt^2}\ \ \ddot{y}$	Second ordinary time derivative of y.
Vectors and dyadics	
$\vec{\mathbf{v}}$	Vector $\vec{\mathbf{v}}$.
$\vec{\mathbf{0}}$	Zero vector.
$\left\|\vec{\mathbf{v}}\right\|$	Magnitude of vector $\vec{\mathbf{v}}$. $\left\|\vec{\mathbf{v}}\right\| = (\vec{\mathbf{v}} \cdot \vec{\mathbf{v}})^{1/2} = \sqrt{\vec{\mathbf{v}} \cdot \vec{\mathbf{v}}}$
$\vec{\mathbf{v}}^n$	Vector $\vec{\mathbf{v}}$ raised to the n power. $\vec{\mathbf{v}}^n \triangleq \left\|\vec{\mathbf{v}}\right\|^n = (\vec{\mathbf{v}} \cdot \vec{\mathbf{v}})^{\frac{n}{2}}$, e.g., $\vec{\mathbf{v}}^2 \triangleq \left\|\vec{\mathbf{v}}\right\|^2 = \vec{\mathbf{v}} \cdot \vec{\mathbf{v}}$
$\vec{\mathbf{a}} \times \vec{\mathbf{b}}$	Cross product of vector $\vec{\mathbf{a}}$ with vector $\vec{\mathbf{b}}$.
$\vec{\mathbf{a}} \cdot \vec{\mathbf{b}}$	Dot product of vector $\vec{\mathbf{a}}$ with vector $\vec{\mathbf{b}}$.
$\frac{{}^N d\vec{\mathbf{v}}}{dt}$	Ordinary time derivative in reference frame N of the vector $\vec{\mathbf{v}}$.
$\overrightarrow{\mathbf{0}},\ \overrightarrow{\mathbf{1}},\ \overrightarrow{\mathbf{d}}$	Zero dyadic, unit dyadic, dyadic $\overrightarrow{\mathbf{d}}$.
Mass, center of mass, inertia	
S_{cm}	The subscript cm denotes the mass center of a body or system S.
m^S	Mass of S (S is a particle, body, or system of particles and bodies).
$\overrightarrow{\mathbf{I}}^{S/O}$	S's inertia dyadic about point O (S is a particle, body, or system of particles and bodies).
$\mathrm{I}^{S/O}_{\hat{\mathbf{u}}\,\hat{\mathbf{v}}}$	S's inertia scalar (moment or product) about point O for the unit vectors $\hat{\mathbf{u}}$ and $\hat{\mathbf{v}}$.
Rotational kinematics	
${}^{\mathrm{a}}R^{\mathrm{b}}$	Rotation matrix relating the right-handed orthogonal unit vectors $\hat{\mathbf{a}}_{\mathrm{x}}$, $\hat{\mathbf{a}}_{\mathrm{y}}$, $\hat{\mathbf{a}}_{\mathrm{z}}$ to the right-handed orthogonal unit vectors $\hat{\mathbf{b}}_{\mathrm{x}}$, $\hat{\mathbf{b}}_{\mathrm{y}}$, $\hat{\mathbf{b}}_{\mathrm{z}}$.
${}^N\vec{\boldsymbol{\omega}}^B$	Reference frame B's angular velocity in reference frame N.
${}^N\vec{\boldsymbol{\alpha}}^B$	Reference frame B's angular acceleration in reference frame N.
Translational kinematics	
$\vec{\mathbf{r}}^{Q/O}$	Point Q's position vector from point O (sometimes denoted ${}^{\mathrm{O}}\vec{\mathbf{r}}^{\mathrm{Q}}$).
${}^N\vec{\mathbf{v}}^Q$	Point Q's velocity in reference frame N.
${}^N\vec{\mathbf{a}}^Q$	Point Q's acceleration in reference frame N.
Momentum, inertia force, kinetic energy in a reference frame N	
${}^N\vec{\mathrm{L}}^S$	S's translational momentum in reference frame N (S is a particle, body, or massive system).
${}^N\vec{\mathrm{H}}^{S/O}$	S's angular momentum about point O in reference frame N (S is a massive system).
${}^N K^S$	S's kinetic energy of S in reference frame N (S is a particle, body, or massive system).
Forces, moments, torque	
$\vec{\mathbf{F}}^{Q/R}$	Force on point Q by point R.
$\vec{\mathbf{F}}^S$	Resultant of forces on the point, particle, body, or system S.

$\vec{\mathbf{M}}^{S/O}$	Moment of the set S of bound vectors about point O.
$\vec{\mathbf{T}}^{A}$	Torque of the couple associated with the replacement of forces on rigid object A.
$\vec{\mathbf{T}}^{A/B}$	Torque of the couple associated with forces on rigid object A by rigid object B.
Power, work, potential energy in a reference frame N	
${}^{N}\mathrm{P}^{S}$	Power due to all the forces on point, body, or system S and S's motion in N.
${}^{N}\mathrm{W}^{S}$	Work due to all forces on point, body, or system S and S's motion in N.
${}^{N}U^{S}$	Potential energy due to all forces on system S and S's configuration in N.