Mechanics Map Formatting Guidelines

Terminology:

* Engineering Mechanics – Collectively, the study of the interaction of forces, bodies, and motion
* Statics – The study of rigid bodies in equilibrium
* Dynamics – The study of rigid bodies in motion
* Strength of Materials – The study of deformable bodies
* Particles – A body where we assume all mass is concentrated at a single point.
  + Alternatively we will talk about concurrent force systems, which we will approximate as particles
* Rigid Bodies – A body that is assumed to not deform under loading and that has a distributed mass

Website Format:

* Webpage
  + Each html page should have a title “Mechanics Map - \*Subject Title\*”
  + Use the <h1> tags for a visible title on the top of the page
  + Use the <h2> tag for section headings within the page
  + Use the <strong> tags to bold important terms used for the first time.
* Images
  + Use public domain images or self-generated images if possible.
  + Images under a CC-BY-SA or CC-BY can also be used, with the source being attributed in the image caption.
  + Always include an image caption.
  + Images in the main content area should be no more than 600px in width (standard should be 500px)
  + Worked problem images should be no more than 500px in width
* Equations
  + For accessibility reasons, all equations should be written in LaTEX using the MathJax pluggin
    - Use an equation table to organize and center the equation
    - The equation itself in the mathjax tags
      * \[ \*put LaTEX equation here\* \]

Symbols:

* Body Physical Properties and points
  + – mass
  + – Centroid point for a 2D area
  + for the x and y coordinates of the centroid
  + – center of mass point
  + − a fixed ground point, particularly for fixed axis rotation
  + Other points should generally be labeled A, B, C, etc
* Vectors
  + Vectors use an rightward arrow over the variable (the \vec{} tag in LaTEX
* Forces
  + – a force
  + – a force at point A
  + – The x component of the force at A
  + – The gravity force
  + – A normal force
  + – A tension force
  + – Force from a spring
  + – Force from a damper
* Moments
  + – a moment
  + – the moment about point A
  + – the moment about point A about the x axis
* Moments of Inertia
  + – Mass moment of inertia for 2D problems, always use subscript to denote point the moment of inertia is about.
  + and for mass moments of inertia in 3D about the center of mass
  + and Add to the subscript if using a point other than the center of mass
  + K is used for the radius of gyration.
* Motion in one dimension
  + – position in one dimension
  + or – velocity in one dimension
  + or a – acceleration in one dimension
* Motion in x – y coordinates
  + and position
  + or and or velocities
  + or and or accelerations
* Motion in n – t coordinates
  + velocity
  + or and accelerations
* Motion in polar coordinates
  + and for position
  + and for velocities
  + and for acceleration
* Relative Motion
  + *(position of A with respect to B)*
  + *(position of A wrt origin)*
  + *(velocity of A with respect to B)*
  + *(velocity of A wrt origin)*
  + *(acceleration of A with respect to B)*
  + *(acceleration of A wrt origin)*
* Coordinate systems for relative motion analysis
  + x and y coordinates reserved for the fixed ground frame of reference
  + Use and coordinate directions for first coordinate system that rotates with the body (mirroring polar kinematics), up the subscript number for each additional rotating coordinate system that is required
* Work and Energy
  + W – Work
  + KE – kinetic energy
  + PE – potential energy
  + P – Power
  + – efficiency
* Impulse Momentum
  + – Impulse (Use vector in for vector form, use subscripts () when discussing components
  + – Momentum (Use vector when in vector form, use subscripts for initial and final and for direction when breaking it down into components
  + – For 2D collisions, use subscripts (in this order) to describe the body, initial vs. final, and the direction.
  + – Impulse (Use vector in for vector form, use subscripts () when discussing components
* Vibrations
  + *k – spring constant*
  + *– equivalent spring constant*
  + *c – damping constant*
  + *= forced frequency*
  + *= natural frequency*
  + *= damped natural frequency*

Graphics:

* Free body diagrams
  + Free body diagrams should show only the body (no background), with the body itself in black
  + Coordinate systems should be drawn as appropriate in black
  + The coordinate system should be drawn on the diagram, also in black.
  + Forces should be shown as red vectors
  + Moments in planar problems should be shown as purple curving vectors
  + If velocities or accelerations are shown, use a dashed blue vector
  + Key dimensions should be shown in blue

Video Formatting:

* Videos
  + Videos should be uploaded to the group YouTube account
  + Each video lecture should be titled “\*Section Number\* \*Subject Name\* - Video Lecture - \*Your initials\*
  + Each worked problem video should be titled “\*Section Number\* \*Subject Name\* - WP### - \*Your Initials\*
  + Please have the problem itself shown at the beginning of the video and give a brief verbal recap of the problem
  + Don’t refer to the problem number in the video itself (just say “In this problem”). This makes it easier if we add problems and change the numbers.