

Assignment #4: Angular Kinetics

Description

During the course section on angular kinetics, the students are given multiple mathematical-based questions concerning the radius of gyration, moment of inertia, centripetal force, and angular

Example Question

Example of angular kinetics questions:

1. A 1.3-kg tennis racquet has a moment of inertia about its axis of rotation of 0.4 kg/m^2 . What is its radius of gyration from the standard grip position?
2. A volleyball player's arm has a mass of 2.7kg and moves at an average angular velocity of 16 rad/s during execution of an attack. If the average moment of inertia of the extending arm is 5.292 kg/m^2 , what is the average radius of gyration for the arm during the attack?
3. If the centripetal force exerted on a swinging lacrosse stick by a player's hand is 50 N, how much reaction force is exerted on the player by the racket?
4. A diver leaves a high dive and starts to spin with an angular velocity of 2.6rad/s and an angular momentum of $19.30 \text{ kgm}^2/\text{sec}$. Given that the diver has a mass of 44.65kg, what is their radius of gyration at this instance in time?

Tags

Assigned Readings

Ancillary AI Assessment (AAA)

The students will copy and paste each question in ChatGPT and request the AI to provide a workflow and solution for each question. The students will submit the completed chat file/link along with a written discussion on the following questions.

- Walk through each question's provided workflow and solution. Double-check each one using the methods you have learned in class. If the software used a different formula or method, write yours down with its solution.
- Did the answers provided by ChatGPT match the answers you calculated? If not, why do you think they are different? Which solution (yours or the one provided by ChatGPT) do you believe to be the actual correct answer and why?
- Using the ethical framework outlined in the Montreal Declaration, does using ChatGPT to solve your homework questions constitute ethical and responsible usage of AI? Is there any method or alternative action concerning this situation that would change your stance (i.e. if you had ChatGPT do something else besides solve the solution, would that change your stance on if the action is ethical or not?)
- The assignment required you to have ChatGPT to solve the problems. Does your stance/opinion outlined above change if a different assignment/instructor/course/school does not allow such actions? If so, how?