Mechanics and machines, HW DYN1

Inverse dynamics problem

Innopolis University

Short task description

Description: Solve Inverse Dynamics problem for four link bar mechanism by hand (code) and by ANSYS Rigid Dynamics Analysis

Artefacts:

- full archive of ANSYS project
- Code
- 1-3 page report, which contains formulas explanation, considered assumptions and results

Extended task description

1. Take this detail, 1st joint is controllable, other - not
2. *Find angle limits* (where the mechanism stucks) for each joint:
   a. **By code** (solving kinematics problem for each angle)
   b. **Using Fusion**
3. *Compare results*, present a result as a pie chart
4. *Make the scene in Ansys*:
   a. All links are bronze alloys
   b. Add joints, contacts, earth gravity
5. Choose the biggest angle gap between joint limits and put yo
   link in the beginning of it (in Fusion or in ANSYS (configure))
6. Apply constant angular acc. for joint = 0.2 rad/s^2.
7. *Find a torque* for 1st joint:
   a. **By code**
   b. **Using Ansys**
8. *Compare results*.