**Gantry Loader – Turning Machine (GLTM)**

It is required to design a gantry loader system for CNC turning machine/lathe for picking the work piece from a specified location and place it in position for the chuck or collet to grip it. The weight carrying capacity of the loader should be minimum 3 kg. A vertical lift of 1500 mm, horizontal travel of 1000 mm is essential in the working envelope. The pickup position is in vertical orientation and the chuck/collet is horizontal orientation. The loader is required to be equipped with provision to orient the work piece appropriately.

You are required to design the mechanism for picking the work piece from the pickup location and transfer it to the chuck/collet. The design should clearly provide the mechanism implemented, design calculations for strength/dimensions for each link/component and justify selection of any off-the-shelf component like bolts, bearings, bushes, motors, couplings etc. You can select the gripper/end effecter of your choice but you need to clearly specify its features and limitations.

**Submission**

1. You are required to develop at least two alternate concepts at sketch level and give complete comparison of these for selecting the better concept.
2. It is required to submit a design report including the sketches of the concepts, comparison of the concepts and justification of the best concept selected, detailed design calculations with load cases/failure assumptions, selection catalog references for the concept that is selected for detailing.
3. It is also required to submit the CAD assembly of your design.