

This exercise will introduce you to some of the tasks and decisions that engineers face. You will do this exercise individually, and each group will hand in one assignment.

- Design a truss bridge with the following criteria:
 - **Total cost of bridge must not exceed \$250,000.**
 - **Bridge deck must be at least 12 m above the water level in the river.**
 - **The bridge must be only one span (not two).**
 - **The bridge must stand under its weight and the test truck.**

Some hints for designing your truss bridge:

- Start with the HELP screen and read the design specifications.
- Select Deck Elevation and Support Configuration
 - Deck elevation: A change in the deck elevation changes the needed excavation and costs.
- Select a Standard Truss
- Fill in Title Block
- Design the Steel Truss
 - Draw the joints
 - Draw the members
 - Run load test
 - Improve design as needed.
- Cost of bridge is the sum of site and truss costs
 - Site costs include any required excavation plus the abutments and piers that support the bridge and the bridge deck.
 - Truss costs include the materials and labor to build the truss.
- Use a standard truss template to get started
 - Hollow tubes vs. solid bars
 - Hollow tubes cost more than bars.
 - Tubes carry compressive forces more efficiently than bars.
 - Bars and tubes carry tension forces with equal efficiency.
- Load test
 - Tension members turn blue.
 - Compression members turn red.
 - Intensity of color proportional to stress level.
 - Deflections are exaggerated by a factor of 10.

Bridge with the most cost effective design will receive grade of 100.