

Faculty of Maritime Engineering and Marine Sciences

Finite Elements

Project 1– FEM beam analysis in the plane

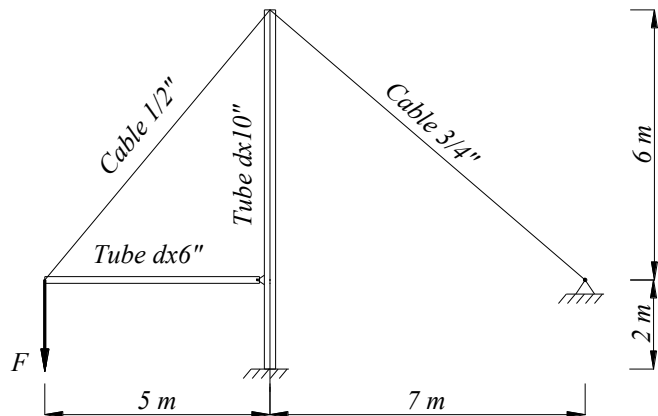
Nov. 07th, 2022

Teamwork (3 students per group, at least one must be from outside Guayaquil, and no more than one female student in any group). Each group will select a leader, who is responsible in this project, to chair meetings, organize tasks, load the final report in the AulaVirtual platform, and, report the contribution from each member).

You are asked to design, build and test a combination of the model of mast, boom and supporting cables of a ecuadorean tuna fishing vessel. Main characteristics of the system are: mast height 1 m and boom length of 1.2 m. **The design must be such that the system supports an F force of 10 kg, but it must fail when loaded with 15 kg.** Material is open, but a good choice is balsa panel of small thickness. **For the test you will only be provided with a table of 108 cm of diameter. So, you must bring your weights, which will be check before the test, and all other devices to anchor your model to the table.**

Suggestion: analyze the system as it were formed by beam+bars in the plane, using the computer program developed in assignment 3, and analyze possibility of any mode of failure (yield strength or buckling of compressed elements). You cannot ask for support from students who already approved this course.

You have to submit a written report, maximum of 6 pages without considering appendix. Format for the report will be provided.



Tube dx: Double Extra Strong

Progress control:

- Nov. 10th, Thursday: First FE analysis with dimensions and simple characteristics.
- Nov. 14th, Monday: Final design, identifying possible mode of failure.

Evaluation:

Written report 65% (i. Aesthetics and redaction, ii. Completeness and organization, and, iii. Result analysis: structural analysis, satisfaction of requirements, conclusions and recommendations, and, research contribution), oral presentation: 35% (Quality of graphic material, English pronunciation, and Response to questions).

**Due dates: test in public, 8h00 am Thursday Nov. 17th in the PrOce lab Square.
Written report and oral presentation: 8h00 am, Nov. 23rd.**