

Space structures

10. References and ECSS standards

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EVALUATION OF THE COURSE

Introductory course

Address/review the core competences (physics, materials, structural behaviours)

Analytical and numerical models and methods for solving static, dynamics, buckling and thermoelastic response of space structures embedded in the mechanical environment produced by the mission in its different phases.

Identify the geometrical (configuration), mechanical and other nature critical design drivers.

Take into account the overall system engineering process and the verification and the production aspects.

TOPICS FOR FURTHER STUDY FOR STRUCTURES SPECIALISTS

1. Mechanics of materials
2. Structural analysis
3. Dynamics of continuous and discrete systems
4. Stochastic mechanics
5. Nonlinear response of structures and stability
6. Thermoelasticity
7. Finite element analyses and procedures
8. Mechanics of joints and connections
9. Space system engineering
10. Verification by test and test correlation with numerical prediction
11. Cost modelling
12. Coupled analysis (multiphysics – e.g. fsi - , structures/control, structures/rigid multi body motions)

ESSENTIAL REFERENCES

T.P.Serafin, Spacecraft structures- from concept to launch, Kluwer academic publishing, 1995.

J.R.Wertx, W.J.Larson, Space Mission analysis and design, 3rd ed. Space Technology Library, 1999

ARIANE 5 User's manual.

ECSS standard collection.