Structural mechanics

**Structural mechanics** or **Mechanics of structures** is the computation of [deformations](https://en.wikipedia.org/wiki/Deformation_(engineering)), [deflections](https://en.wikipedia.org/wiki/Deflection_(engineering)), and internal [forces](https://en.wikipedia.org/wiki/Force) or [stresses](https://en.wikipedia.org/wiki/Stress_(physics)) (*stress equivalents*) within structures, either for design or for performance evaluation of existing structures. It is one subset of [structural analysis](https://en.wikipedia.org/wiki/Structural_analysis). Structural mechanics analysis needs input data such as [structural loads](https://en.wikipedia.org/wiki/Structural_load), the [structure's geometric representation](https://en.wikipedia.org/wiki/List_of_structural_elements) and support conditions, and the materials' properties. Output quantities may include support reactions, [stresses](https://en.wikipedia.org/wiki/Stress_(physics)) and [displacements](https://en.wikipedia.org/wiki/Displacement_(vector)). Advanced structural mechanics may include the effects of stability and non-linear behaviors.

Mechanics of structures is a field of study within applied mechanics that investigates the behavior of structures under mechanical loads, such as bending of a beam, buckling of a column, torsion of a shaft, deflection of a thin shell, and vibration of a bridge.

There are three approaches to the analysis: the [energy methods](https://en.wikipedia.org/wiki/Energy_principles_in_structural_mechanics), [flexibility method](https://en.wikipedia.org/wiki/Flexibility_method) or [direct stiffness method](https://en.wikipedia.org/wiki/Direct_stiffness_method) which later developed into [finite element method](https://en.wikipedia.org/wiki/Finite_element_method_in_structural_mechanics) and the [plastic analysis](https://en.wikipedia.org/w/index.php?title=Plastic_analysis&action=edit&redlink=1) approach.

Click below for the books related to structural mechanics:

1. ray hulse&jack cain

2.m.l.gambhir

3.a.k.upadhyay

4.alberto carpinteri

5.ss bhavikatti