UNIVERSIDADE FEDERAL DO CEARÁ

FEDERAL UNIVERSITY OF CEARÁ
OFFICE OF THE VICE PROVOST FOR UNDERGRADUATION (PROGRAD)
COORDINATION FOR PROJECT AND CURRICULUM DEVELOPMENT
CURRICULUM DEVELOPMENT DIVISION

1. Academic unit offering the curricular component (Faculty, Center, Institute, Campus)**:**

Center of Technology

2. Department offering the curricular component (when applicable)**:**

Mechanical Engineering Department

3. Undergraduate course(s) offering the curricular component

Code of the Course	Name of the Course	Course Degree[1]	Curriculum (Year/ Semester)	Nature of the Component[2]	Semester of Offer[3]	Habilitation[4]
91	Telecommunications Engineering	Bachelor	2015.1	Mandatory	08	-

4. Name of the curricular component:
Solid Mechanics Fundamentals

5. Code of the curricular component (filled by PROGRAD)**:**
TE0252

6. Prerequisites — No ( ) — Yes (x)

Code	Name of the curricular component / activity
CE0846	Fundamentals of Physics
TI0136	Integrated Actions in Science and Technology II

7. Co-requisite — No (x) — Yes ( )

Code	Name of the curricular component / activity

8. Equivalences — No ( ) — Yes (x)

Code	Name of the curricular component / activity
TI0105	Introduction to Solid Mechanics

9. Day period of the curricular component (more than one option can be selected)**:**

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1 **Fill with *Bachelor (Engineer), Licenciate,* or *Technologist.***
2 **Fill with *Mandatory, Optional,* or *Elective.***
3 **Fill when mandatory.**
4 **When elective, fill with the habilitation or emphasis to which the curricular component is linked.**

(x) Morning (x) Afternoon (x) Night

10. Regime of the curricular component:

(x) Semester ( ) Yearly ( ) Modular

11. Justificatory for the creation/regulamentation of this curricular component

Provide students with the knowledge to enable them to analyze and design machines and structures in a simple and logical manner, i.e., enabling them to verify the safety and functionality of existing machines and structures (analysis) or to set their dimensions with the aim of resisting external stress with safety, functionality and economy (design).

12. Objectives for the curricular component:

Introduce elements of stress and strain analysis into mechanical components and structural components, incorporating calculation methods based on energy and including the fundamental concepts of structural integrity.

13. Syllabus:

Equilibrium of rigid bodies; Stress analysis; Strain analysis; Pure bending; Energy of deformation.

14. Program:

1. Rigid body equilibrium: Definition of equilibrium equations for the material point and the rigid body, in a plane and in space; Free body diagram; Method of sections; Requesting internal efforts.
2. Stress analysis: Axial stress; Medium stress; Stress at one point; Definition of tensile and compression stresses; Shear stress; Crushing stress; Stress on an inclined plane; Triaxial stress state; Triple stress state.
3. Strain analysis: Strain analysis; Deformation at one point; Stress strain ratio; Isotropic material; Ductile and brittle materials; Hooke's law; Generalized Hooke's law; Poisson's ; Deflection calculation; Total deflection for axial load.
4. Pure bending: Pure bending on straight shaft beams; Deformation calculation; Calculation of tensions in the elastic regime.
5. Creep energy: Creep internal energy; Energy theorems; Complementary energy; Collapse theory.

15. Workload description

Number of Weeks:	Number of Credits:	Total Workload in Hours:	Theory Workload in Hours:	Practice Workload in Hours:
16	02	32	32	-

16. Basic bibliography:

1- Beer, F. P. e Johnston, Jr., E. R., Resistência dos Materiais, 3a Edição, MAKRON Books, São Paulo, 1995;

2- Popov, Egor P., Introdução à Mecânica dos Sólidos, Editora Edgard Blücher Ltda, São Paulo, 1978.