

Mechanical Design

Materials Multi-Materials Eco-Constructions and Innovative Building Systems

IDENTIFICATION

CODE : GCU-4-S1-EC-SCI
ECTS : 1.0

HOURS

Lectures : 8.0 h
Seminars : 8.0 h
Laboratory : 0.0 h
Project : 0.0 h
Teacher-student
contact : 16.0 h
Personal work : 36.0 h
Total : 52.0 h

ASSESSMENT METHOD

Project

TEACHING AIDS

Duplicated documents
On-line documents

TEACHING LANGUAGE

French

CONTACT

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AIMS

This course based on a project approach is developed with a vision Materials Multi-Materials Eco-Constructions and Innovative Building Systems. It is a question, for the students, of seizing the recent results of the research in materials and constructive processes, and of designing a structural element, a construction (house or building), or constructive process, innovating and at the service of a sustainable construction or eco-construction. In their approach and for the purpose of justifying the proposed innovations, students can rely on the various examples illustrated in the course and also on research through scientific publications.

CONTENT

- Current issues in the construction world & solutions in the current context of decarbonization of construction. How to reduce the CO2 balance: choice of alternative materials; design choice: Archi and Engineers
- Earth construction
- Additive manufacturing applied to concrete: 3D printing
- Fiber-reinforced concrete & Modular housing
- Biobased materials
- Others

BIBLIOGRAPHY

Avila, F., Puertas, E., & Gallego, R. [2021]. Characterization of the mechanical and physical properties of unstabilized rammed earth: A review. Construction and Building Materials, 270, 121435.

Bui, T. T., Limam, A., Desevedavy, G., & Damichey, D. [2022]. Highly environmental-efficient modular houses considering construction and deconstruction aspects. In CIGOS 2021, Emerging Technologies and Applications for Green Infrastructure: Proceedings of the 6th International Conference on Geotechnics, Civil Engineering and Structures (pp. 657-665). Springer Singapore.

Nguyen, T. D., Bui, T. T., Limam, A., Bui, T. L., & Bui, Q. B. [2021]. Evaluation of seismic performance of rammed earth building and improvement solutions. Journal of Building Engineering, 43, 103113.

Jami, T., Karade, S. R., & Singh, L. P. [2019]. A review of the properties of hemp concrete for green building applications. Journal of Cleaner Production, 239, 117852

PRE-REQUISITE

- Knowledge of the mechanical behavior and physical properties of Civil Engineering materials.

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