GEOS9AD CONCRETE AND STEEL STRUCTURES

GEOS9AD / GERU06 Master associé Concrete and steel structures	Credits : 2 ECTS Duration: 21 hours	Semester : S9

Person(s) in charge:

Olivier DECK, Professor, olivier.deck@mines-nancy.univ-lorraine.fr

Keywords : reinforced concrete, steel, structural mechanic, Eurocode, Design

Prerequisites :

Basic knowledge in mechanics (stress, strain, yielding criteria, etc.) and in the strength of materials (external and internal forces, strains calculation in a section, deformation calculation of a beam, etc.).

Objective :

The objective of this course is to teach students about designing reinforced concrete structures (Eurocode 2) and steel structures (Eurocode 3).

The contents of this course aim at giving an understanding of the design of steel and reinforced concrete structures. The course presents the properties of materials (fabrication, pathologies, physical properties) and their mechanical behaviour in order to introduce the design of structures in civil engineering. The use of the Robot Structural Analysis software (Autodesk) is also introduced

1. Design principles in accordance with Eurocodes. Partial safety factors and combination of actions (1 class)
2. Steel structures (Eurocode 3) (3 classes)

• Design of current sections

• Taking instabilities into account

• Bracing structures

• Connexions

3. Concrete structures (Eurocode 2): 3 classes

• Design of longitudinal reinforcement

• Design of transverse reinforcement

Abilities :

Levels	Description and operational verbs
Know	
understand	
Apply	
Analyse	
Summarise	
Assess	

Évaluations :

☐ Written test	☐ Continuous control	☐ Oral report	☑ Project	☑ Written report