

PENS-302

Construire dans les zones à radiations naturelles

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Cursus	Sem.	Type
Projeter ensemble ENAC	BA6	Opt.

Langue d'enseignement	français
Crédits	4
Retrait	Non autorisé
Session	Été
Semestre	Printemps
Examen	Pendant le semestre
Charge	120h
Semaines	12
Heures	4 hebdo
Cours	1 hebdo
Exercices	3 hebdo

Nombre de places

It is not allowed to withdraw from this subject after the registration deadline.

Résumé

The teaching unit will focus on the analysis of the fate of a "telluric" non-point source pollutant of the natural environment, Radon, and its impact on the build environment, including potential prevention and remediation solutions, by coupling education and research on specific bad known aspects.

Contenu

Even if Radon is not a pollutant « sensu stricto », we may consider to analyze its fate in a similar matter as « standard » pollutants, as :

- Its telluric origin make it a diffuse (non point source) pollutant, difficult to measure ;
- As a gas moving through the various soil layers, its diffusion dynamic will be strongly influenced by the geology, soil physic, pressure, temperature and humidity ;
- Its sometimes high concentration in buildings, building materials, and drink water distribution systems, may have a strong impact on human health, and make radon a public health issue.

Topics :

- What do we measure ? – Background of radiophysics
- How to measure? – equipment description
- What are the sources of Radon ? – Geology
- How does it move ? Under which conditions ? - Soil physics, hydrogeology
- Where do we find Radon ? - Buildings, building materials, water
- Where and how will Radon be measured? – Field exercices
- What is the confidence and pertinence of the measures – Exercice in groups
- Which issues for the build environment : prevention, remediation ? – Group work.

Acquis de formation

A la fin de ce cours l'étudiant doit être capable de:

Compétences transversales

- Fixer des objectifs et concevoir un plan d'action pour les atteindre.
- Planifier des actions et les mener à bien de façon à faire un usage optimal du temps et des ressources à disposition.
- Utiliser une méthodologie de travail appropriée, organiser un/son travail.
- Dialoguer avec des professionnels d'autres disciplines.
- Etre responsable de sa propre santé et sécurité au travail ainsi que de celles des autres.
- Etre responsable des impacts environnementaux de ses actions et décisions.
- Etre conscient des implications sociales et humaines liées au métier de l'ingénieur.

Méthode d'enseignement

Cours ex-cathedra pour l'acquisition des concepts de base.

Exercices de mesures sur le terrain.

Analyses de données.

Recherche préliminaire sur des aspects encore peu connus de la problématique.

Travail de groupe sur un projet.

Travail attendu

- A max 10 pages report (without encl.), following the typical research paper: current situation, description of the issue, methodology, results analysis and interpretation, conclusion, bibliography.
- A 10 min talk presentation in plenum.

Méthode d'évaluation

Based on 1) the talk (30%) and 2) the report (70%).

Encadrement

Autres The students will be coached by the lecturers during the group work sessions.