

# Thermodynamique appliquée à la géologie

## Lecturer

Sandra ARNDT (Coordinator)

## Course mnemonic

GEOL-F205

## ECTS credits

5 credits

## Language(s) of instruction

French

## Course period

First term

crédits , CHIM-F101 | Chimie générale | 5 crédits and ENVI-F1001 | Sciences de la Terre, Environnement et Société | 5 crédits

## Course having this one as co-requisit

GEOL-F307 | Cycle de la matière et de l'énergie dans les systèmes géologiques | 5 crédits

## Teaching method and learning activities

Theory, exercises.

## References, bibliography and recommended reading

M. Klotz et R. M. Rosenberg (2000) Chemical Thermodynamics: Basic Theory and Methods. 6th edition. John Wiley et Sons. G.M. Anderson (1996) Thermodynamics of natural systems. John Wiley & Sons, New York, 382p.

## Other information

## Contact(s)

Campus de la Plaine, Bâtiment B, 5ème niveau, Local 1B5.108

## Evaluation method(s)

written examination

## Evaluation method(s) (additional information)

Written exam.

## Programmes

Programmes proposing this course at the faculty of Sciences

BA-GEOL | Bachelor in Geology | unit 3

## Course content

Thermodynamics: recall of the concepts of fundamental chemical thermodynamics; calculation of the variations of free energy during reactions between solids; evaluation of associations of stable minerals; equilibrium between solid and aqueous phases; influence of temperature and pressure on equilibrium. Kinetics: recall of basic concepts of the kinetics of homogeneous reactions; heterogeneous reactions: process of transfer of the components in the liquid and solid phases; control of the rate of dissolution by reactions at the interface; case of congruent dissolutions; case of incongruent reactions with diffusion through residual layer; reaction of homogeneous and heterogeneous nucleation: reactions of precipitation; kinetics of mineral growth.

## Objectives (and/or specific learning outcomes)

To study the thermodynamic and kinetic aspects applied to geochemical reactions occurring at the Earth surface.

## Pre-requisits and co-requisits

### Pre-requisites courses

CHIM-F101 | Chimie générale | 10 crédits, CHIM-F101 | Chimie générale | 15 crédits, CHIM-F101 | Chimie générale | 20