



# Faculté des sciences appliquées

## FSA

MAPR2370 Corrosion & protection of metals

[22.5h] 2 credits

This course is taught in the 2nd semester

**Teacher(s):** Christian Leroy  
**Language:** french  
**Level:** 2nd cycle course

### Aims

The course aims at analysing the corrosion mechanisms of metals and at deducing the techniques for their protection against corrosion. Elements of tests and measurements of corrosion complete the course.

### Main themes

- Principal observations of mechanisms of corrosion, types of corrosion, standard of most frequent corrosion environments.
- Concepts of electrochemistry to understand mechanisms of corrosion of metals.
- Electrochemical equilibrium diagrams (Pourbaix diagrams) of usual metals (iron, aluminium, copper, zinc, lead, tin and their alloys such as stainless steels).
- Significant types of electrochemical corrosion, corrosion at higher temperature and bacterial corrosion.
- Techniques of protection against corrosion: cathodic protection, contribution of inhibitors, formation of passivating layers or application of protective coatings (metal, vitreous or organic).
- Tests and measurements of corrosion: tests of accelerated corrosion, simulations in laboratory and natural or industrial site.
- Basic bibliography.

### Content and teaching methods

- General Mechanisms of corrosion, corroding environments, types of corrosion. - Concepts of electrochemistry in relation to the corrosion of metals. - Electrochemical equilibrium diagrams. - Analysis of various types of electrochemical corrosion. - Corrosion at higher temperature. - Bacterial corrosion. - Techniques of protection against corrosion. - Tests and measurements of corrosion.

### Other credits in programs

<b>FSA3DA</b>	Diplôme d'études approfondies en sciences appliquées	(2 credits)	
<b>INCH21</b>	Première année du programme conduisant au grade d'ingénieur civil chimiste	(2 credits)	
<b>INCH22</b>	Deuxième année du programme conduisant au grade d'ingénieur civil chimiste	(2 credits)	Mandatory
<b>MAP23</b>	Troisième année du programme conduisant au grade d'ingénieur civil en mathématiques appliquées	(2 credits)	