UCL Faculté d'ingénierie biologique, agronomique et environnementale

AGRO

BIR1333 Bioclimatologie

[15h+7.5h exercises] 2 credits

This course is taught in the 1st semester

Teacher(s): Thierry Fichefet, Jean-Pascal van Ypersele de Strihou
Language: french
Level: 1st cycle course

Aims

This course has the essential objective to initiate the student to bioclimatology and to the associated meteorological aspects. In particular, it leads the student to:
- understand, with a basis in physics, the climate formation mechanisms at different levels (from the global level to that of the microclimatic station);
- apprehend the interaction between these mechanisms and the soil vegetation as well as the soil;
- be initiated to the measuring instruments of the climatic factors and to use climatic data, obtained through meteorological data bases, in agronomic and environmental applications.
These directives allow the student to grasp the importance of the climatic factors for biomass production, species distribution at the scale of the globe, the rural planning, the impact of humanly induced changes of the environment on the microclimate#

Main themes

1. Physical bases are necessary to understand the exchanges of mass and heat in the low strata of the atmosphere, inside the vegetal populations and in the superior layers of the soil: a) radiation: review of the laws, natural radiation, interaction of the electromagnetic radiation with plants, use of the active photosynthetic radiation, radiate balance; b) mass and heat exchanges: by conduction and convection; c) water: atmospheric humidity, precipitation, water circulation in a continuum soil-plant-atmosphere, real and potential evapo-transpiration #
2. Climate formation mechanisms, from the global scale to the microclimatic scale of the station: a) atmosphere: structure, vertical profiles in the low layers, lateral movements, atmospheric circulation, cloud and precipitation, green house effect; b) topoclimates and microclimats: effects of the elements of the landscape, dynamic and thermal action of the relief and vegetation; c) influence of human activities on the climate and impacts of the global climatic change on agronomic activities.
3. Agroclimatology: a) collection, organization, treatment and analysis of agroclimatic data (network); b) measuring the climatic factors (temperature, humidity, precipitation, velocity and direction of the wind, components of the radiation balance#) and description of the main instruments destined to measure these factors; c) climatic indexes (temperature sum#)

Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

Precursory courses : All the courses of BIR 11 and BIR 12
Support : Source to consult: Gérard Guyot "Climatologie de l'environnement. De la plante aux écosystèmes", Masson, Paris, 1997.

Other credits in programs

BIR21/A	Première année du programme conduisant au grade de bio-ingénieur (Agronomie)	(2 credits)	Mandatory
BIR21/E	Première année du programme conduisant au grade de bio-ingénieur (Environnement)	(2 credits)	Mandatory
ENVI3DS/4	Diplôme d'études spécialisées en science et gestion de l'environnement (Administration publique, environnement)	(2 credits)	Mandatory
ENVI3DS/5	Diplôme d'études spécialisées en science et gestion de l'environnement (Santé et environnement)	(2 credits)	Mandatory
ENVI3DS/6	Diplôme d'études spécialisées en science et gestion de l'environnement (Science et environnement)	(2 credits)	Mandatory
GEOG12	Deuxième candidature en sciences géographiques	(3 credits)	Mandatory