|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| N° ECUE | XA4S712 | | | | | | | | |
| Title | Aquatic ecosystems survey and management | | | | | | | | |
| ECTS : 3 |  | Lecture(h)  CM : 15 |  | Tutorials (h)  TD : 24 |  | Pratical works (h) TP |  | Project (h) |  |
| Description  This course provides concepts and methodologies for i) biological data acquisition (sampling methods, fishing techniques, etc.), ii) population and community study (abundance assessments, mark-recapture methods, modelling, multivariate analyses, etc.), and iii) habitat and biological resource managements (preservation, restoration, sustainability, etc.). It also provides tools (biological indicators) to assess the ecological quality of aquatic ecosystems in the context of the EU Water Framework Directive.  Content  Biological study methodology: *1 Data acquisition ; 2 Sampling methods ; 4 Fishing techniques*  Population studies: *1 Population characteristics ; 2 Abundance assessment (Successive survey ; Mark-recapture methods) ; 3 Ecology modelling (Population growth, survival; Age-structured populations; Individual growth models)*  Community studies: *1**Community indices ; 2 Rank models ; 3 Multivariate analysis*  Ecological quality assessment**:** *Biological indices – Multimetric Invertebrate Index*  Managements: *1 Human pressure and threats on the ecosystems ; 2 Managements objectives ; 3 Habitat preservation / Habitat enhancement : 4 Resource management (Sustainable fisheries ; Aquaculture ; Restocking;) 5 Legislative context*  Global environmental indicators: *1 Climate change; 2 Greenhouse effect and carbon footprint ; 3 Ecological footprint; 4 The concept of virtual water*  Tutorial sessions are performed in computer labs using R package and PRIMER software.  Learning outcome  Students completing this course get knowledge on:  • statistical analysis and modelling of biological systems  • ecological quality assessment with biological indicators and global indicators  • implementation of management tools (SAGE, river contract)  • environmental regulations (DCE, SDAGE, impact assessment, Natura 2000)  They will be able to:  • carry out environmental impact studies  • estimate the abundance of the biological resource in the natural environment  • make a diagnosis of the biological state of aquatic environments (continental, estuarine and coastal waters)  • know the requirements of the European Framework Directive on Water and to control the methods of monitoring and management of aquatic environments | | | | | | | | | |
| Key Words | Population dynamics; Stock assessment; Community studies - Diversity ; Habitat management; Water framework directive; Biological indicators | | | | | | | | |
| Type of Evaluation | The final grade is composed of a literature search project (25%), a practical work project (25%) and a final exam (50%). | | | | | | | | |