US412U - Remote Sensing and Spatial Analysis

Valide le 18-01-2019

Code : US412U

10 crédits

Responsabilité nationale :
EPN08 - Institut national des sciences et techniques de la mer (INTECHMER) / Marie-laure MAHAUT

Contact national :
Cnam-Intechmer
Boulevard de collignon
BP324
50110 Cherbourg en cotentin
02 33 88 73 40
Service scolarité
scolarite-intechmer@cnam.fr

Présentation

Prérequis

- **Avoir validé la 1e année de Bachelor Océanographe-Prospecteur**

OU
- **Par VAE/VES**

Objectifs pédagogiques

• To provide students with an understanding of the theory underpinning RS methodologies and approaches.
• To provide an introduction to specific RS products and their uses.
• To provide intermediate and advanced skills in spatial analysis
• To provide practical skills in acquiring, manipulating and transforming R.S. data into knowledge based products.

Compétences

Acquire, manipulate and perform analysis on a variety of RS data types.

Integration of G.I.S. spatial analysis methodologies with RS products to support appropriate decision making

Programme

Contenu

Introduction to remote sensing. History and scope of remote sensing. Principles of Remote Sensing: The Photon and Radiometric Parameters. Introduction to the Quantum Physics underlying Remote Sensing; Use of spectroscopy in determining quantum levels. Transmittance, absorption, and reflectance.

The Electromagnetic Spectrum: Distribution of Radiant Energies. Introduction to Spectral Signatures, sensor technology and the importance of resolution. Introduction to passive and active RS systems. Review of RS file formats and file handling strategies. Use of raster data in a G.I.S. including raster processing tools and map algebra.

Introduction and review of major passive optical RS strategies including Landsat, Spot, MODIS, ASTER and high resolution products such as IKONOS and Quickbird. Acquisition and use of aerial photography. Review of European Space Agency strategies. Review of EOS strategies.

Processing and classification of RS data including visual interpretation, computer based pattern recognition, pixel based and object orientated approaches, supervised and unsupervised classification.

Principles of geodesy, surveying, cartography. Map projections. Introduction to datums.

Practical introduction to Geographical Information Systems and their use in environmental management. Review and use of major commercial GIS software packages. Data strategies in GIS. Spatial data structures. Visualization and query of spatial data. Integration of GIS and DGPS data.

Practical introduction to spatial analysis including interpolation techniques and suitability modelling.

Modalités de validation

- Projet(s)

Description des modalités de validation

Assessment Criteria

Portfolio 1