HBB300 - Information and Communication Technology

Mis à jour le 16-04-2024

Code : HBB300

Unité d'enseignement de type mixte

3 crédits

Volume horaire de référence (+/- 10%) : **30 heures**

Responsabilité nationale : EPN08 - Institut national des sciences et techniques de la mer (INTECHMER) / Claire MARION

Présentation

Prérequis

Entry Requirements

Initial Competences

Same as to be admitted to higher education.

Relation to other courses; knowledge acquired in this course can be used in:

HB350 – Geodesy & Cartographic systems,

HB360 – Hydrographic Surveying

HB500 – Hydrographic Practice

HB370 - Data Management

Objectifs pédagogiques

Module Outline:

1. A short overview of the components of a modern computer system and the way they interact will be given. Focus will lie on the central processor unit, storage devices, storage media input and output ports and device drivers in general. Particular attention will be paid to input and output devices frequently used in hydrographic computer systems for real-time data acquisition.
2. Next, we describe the role and architecture of mainstream operating systems such as Windows, UNIX and Linux. We list the functions and operations provided by an operating system and learn how to work with common application software systems such as spreadsheet, word processor, graphics software, presentation software and internet browser.
3. We then turn to software development procedures: we discuss how to state the requirements of the system to be developed, interface design, algorithm development, flowcharts, and pseudocode. We then turn our attention to a modern programming language (e.g. Python) to be used in developing our software. We define the syntax, data types and structures, control structures, arrays, pointers, functions, and file processing procedures. These tools and procedures will demonstrate how (geographical) data/information can be processed, analysed and visualised in a user-friendly way using open-source software and a bottom-up approach.
4. Additionally, the implementation and use of user-defined programming applications in Geographical Information Systems will be demonstrated.
5. We also investigate basic networking. We discuss the networking concepts underlying Internet and intranet communications and pay attention to the features, available resources and security issues of the Internet. We also learn how to conduct searches for specialized information using Internet tools.
6. The final part of this course is dedicated to basic aspects of database management (e.g. Structural Query Language, PgAdmin...) and relational databases. Geospatial databases are foreseen in the Data Management Course.

Compétences

Learning Outcomes:

1. To be able to distinguish the different components of a real-time data acquisition computer system, including different methods of communication and time-tagging.
2. To clearly explain the operation of device drives and their relation to data exchange.
3. Being able to use spreadsheet, word processing, graphical and presentation software.

4. To be able to construct and populate a database and query its content.
5. Being able to design pseudocode and write out a program for data conversion.

6. To clearly and scientifically explain various types of network communication protocols used in remote data exchange applications.

Programme

Contenu

Lecture 1 Computer hardware & OS

Lecture 2 Application Software Systems (e.g. word processor, spreadsheets, graphic software …)

Lecture 3 Internet and intranet communications

Lecture 4 Programming (i.a. file type conversions)

Lecture 5 DBMS, Query Languages, Relation Databases

Modalités de validation

- Contrôle continu
- Projet(s)
- Mémoire
- Examen final

Description des modalités de validation

Evaluation

Evaluation form

Written examination, partly with multiple choice, partly with open questions and programming exercises.

Fieldwork – permanent evaluation of the exercises.

Assessment methodology

The final figure of assessment is composed of:

70% (written examination)

30 % (permanent evaluation)

Assessment criteria

Permanent evaluation is based on the training record book in relation to the number of tasks carried out and the comments of the supervisor(s) expressed in writing in the book.

Theory examination: quality of knowledge, insight, relation between subjects, …