UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Information Systems

2627-3-E4101B025

Learning objectives

The course aims to provide the theoretical and practical knowledge required to design, develop and manage business information systems to support decision-making processes. Particular attention is paid to information management, the analysis of structured and unstructured data, and the use of IT tools to support decision-making in public and private organisations.

Knowledge and comprehension skills
This teaching enables students to acquire a solid foundation in the theory of information systems and techniques of knowledge management and data analysis to be used in the biostatistical/demographic work context.
This teaching will provide knowledge and understanding in relation to:

Design of information systems for data analysis and decision support,
Identification of data sources in a business information system,
Management of structured and unstructured data.
Students will also gain an understanding of the main IT tools used in public and private organisations, decision support systems and architectures for managing large volumes of data.
Applied knowledge and understanding
Students take part in practical exercises using data analysis software and information processing tools, applied to real-world cases.
Through individual and group activities, students will develop the ability to:

use software for the analysis of structured and unstructured data;
query and manage databases and diverse information sources;
use tools for data visualisation and exploration;
apply text analytics and text mining techniques;
interpret the results of analyses to support decision-making processes;
design simple information solutions consistent with organisational needs.
Autonomy of judgement
Through data analysis, students are called upon to make judgements and evaluate corporate communication, CRM

or web-based marketing strategies. Classroom discussions and lecturer feedback on projects support the development of the ability to independently evaluate business cases.
Students are also expected to critically assess the quality of information sources and the suitability of the techniques used for data analysis.

Communication skills
Students have to present group projects orally in front of colleagues and lecturers, developing clear, concise and effective communication skills. During interactive lectures and case discussions, active participation and discussion is encouraged.

Ability to learn
The course provides methodological and practical tools that enable students to independently update their skills in the fields of information systems, data analysis and digital technologies. Through practical exercises, project-based activities and the use of specialist software, students develop the ability to identify new sources of information, learn how to use new tools and apply the skills they have acquired to different practical contexts.

Contents

- Application architectures and technological architectures of information systems
- Digital applications and analysis of information system
- Design of information system for data analysis and decision support system
- Information systems and social media
- CRM
- Introduction to Social Media Analytics
- Big Data and techniques for processing unstructured data
- Text Mining and Text Analytics
- Artificial Intelligence

Detailed program

Application architectures and technological architectures of information systems:

- Database management processes
- Distributed architectures, client server, network, Internet and World Wide Web

Digital applications and analysis of information system:

- The application portfolio in the industrial and service companies
- CRM

Design of information system for data analysis and decision support system:

- Design of processes and data modelling
- BPR
- Activities and information analysis
- Information systems and social media:
- Evolution of enterprise information systems
- Social Media Marketing
- Introduction to Social Media Analytics:

- Sentiment Analysis
- Big Data and techniques for processing unstructured data:
- Text Mining and Text Analytics

Prerequisites

Fairly good skills in learning, writing and speaking are expected, together with a general knowledge about the main technologies and applications of Computer Science. Knowledge of the Office package.

Teaching methods

The course is delivered in Italian and includes classroom lectures and laboratory exercises.
The lectures cover 6 CFU of the course, the exercises cover the remaining 3 CFU.

In the lectures, the theoretical topics inherent to the course are illustrated (delivery mode), and students are assigned project work to carry out in groups and discuss by the end of the course (interactive mode).
The laboratory exercises are aimed at teaching and using techniques for processing unstructured data, Natural Language Processing, in particular to perform Text Mining operations on data downloaded from various web sources.
Also during the exercises, project work is assigned to the students to be carried out in groups and discussed by the end of the exercises.

In detail:

- 42 hours of face-to-face lectures in the first semester (6 CFU):
  of these, 30 hours are delivered in a lecture-style format (DE) in person; 12 hours of discussion and project work presentations are conducted in an interactive format (DI) in person.
- 24 hours of face-to-face practical sessions in the second semester (3 CFU), using languages and software for processing unstructured data.

Assessment methods

The verification method is based on a written test.

The written test takes place at the computer and it consists of 2 open (short essays) and 10 closed questions with multiple answers (TRUE/FALSE). Open questions aim to evaluate the reasoning and critical discussion skills of a topic. The closed questions aim to evaluate the preparation on all the topics of the course. Open questions have a greater weight in the calculation of the final grade.

The evaluation is focused on the student's ability to answer to specific questions by referring both to the theoretical and practical aspects (through examples) connected to the requested topic.

The test is common for both attending students and non-attending students.
There are no intermediate tests.
During the course, students are invited to carry out a project in a group, it is not mandatory, whoever completes it will have a few more points in the exam. Non-attending students can freely choose whether to carry out the project.

The final assessment takes into account:

- the accuracy of theoretical knowledge;
- the ability to apply concepts to the cases presented;
- the ability to interpret the results of the analyses;
- the appropriate use of subject-specific terminology;
- the ability to link the various topics covered in the course.

To achieve a pass, students are required to demonstrate an adequate understanding of the course's fundamental concepts. Higher marks are awarded to students who demonstrate full mastery of the topics, critical thinking and the ability to apply the methodologies covered independently.

Textbooks and Reading Materials

1. G. Bracchi, C. Francalanci, G. Motta. Sistemi informativi d'impresa. McGraw-Hill, 2010.
2. V. Cosenza, "Social media ROI", Apogeo, 2012, ebook available on internet, chapters: 1, 2, 4, 5 (the basic concepts).
   Further material (slides and papers on specific topics) is available on the elearning page of the course.

Semester

The course is delivered in the second cycle of the first semester.

Teaching language

Italian

Sustainable Development Goals

INDUSTRY, INNOVATION AND INFRASTRUCTURE