IN4151 - Information Engineering

Course description & administrative rules

Universidad de Chile
Facultad de Ciencias Físicas y Matemáticas
Departamento de Ingeniería Industrial

9 de agosto de 2022

Agenda

1. Course Description
   - Goals and learning outcomes
   - Contents
   - Tools

2. Administrative Rules
   - Activities
   - Basic rules
   - Evaluation and grading policy

Goals

Purpose of the course

This course seeks to create skills to select and apply data science **business analytics** models to improve public and private organizations' **operational effectiveness and efficiency**, considering their information management needs. Students acquire skills for designing **data models** using relational and NoSQL approaches. In addition, they identify and apply **supervised and unsupervised models** to canonical problems of organizational performance management, using knowledge patterns extraction methodologies.

Assumption

- The IN4151 course assumes that students have no prior knowledge of databases, machine learning (including topics such as data mining or business intelligence), business analytics, and visualization; neither of the specialized programming libraries that will be used for their implementation.
- Knowledge of basic Python libraries for numerical computation is assumed.
- Knowledge of **statistics** is assumed.

Learning outcomes

Fundamentals

Identify information management needs in a public or private organization, contrasting the conditions of the value chain to improve the organization's performance.

Databases

Create data models according to the identified information needs using relational and NoSQL approaches.

Learning outcomes

Business analytics

Select and use predictive analytics models to improve the organization's management performance by applying information and knowledge extraction processes.

Business Processes & Analytics

Identify organizations' business processes to apply activities of predictive, prescriptive and descriptive analytics .

Other learning outcomes

- Clearly and precisely prepares technical reports on data and information management, modeling, and analysis, evidenced in his/her writing the coherent development of a problem, methods and results.
- Read various texts in English (e.g., presentations, scientific articles, and technical reports) to acquire and incorporate knowledge about concepts, definitions, tools, and applications of information engineering.
- Work on her/his tasks (e.g., reports, controls, quizzes) honestly and responsibly, adjusting to the regulations, respecting the intellectual property of others, and exercising a role of individual creation.
- Detects needs considering the current situation of the organization's performance and associated ethical dilemmas to propose innovative solutions based on information engineering tools.

Contents

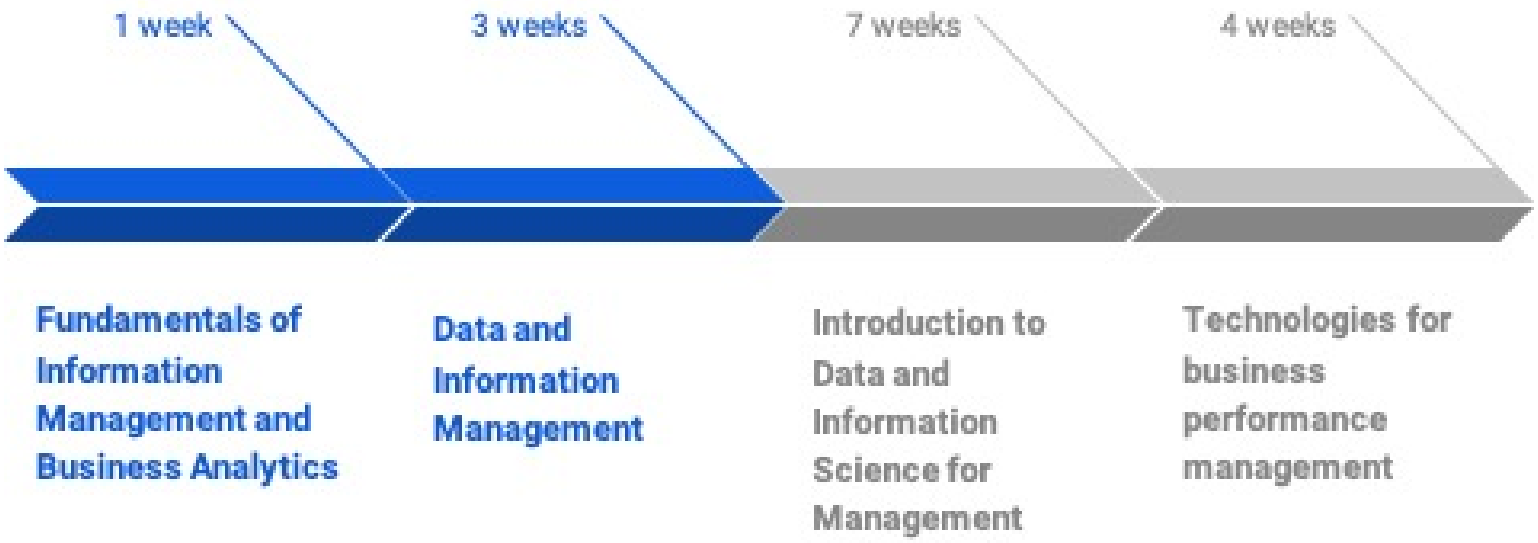

Figura 1: Course units.

Tools

- MySQL: SQL-based relational database engine.
- MySQL Workbench: MySQL database design and management platform.
- Python: The de facto standard programming language in data science.
- Google Colaboratory:"Colab allows to write and execute arbitrary python code through the browser, and is especially well suited to machine learning, data analysis and education.' ' (https://research.google.com/colaboratory/faq.html)
- Jupyter Notebook: It's "an open-source web application that allows you to create and share documents that contain live code, equations, visualizations, and narrative text.' ' (https://towardsdatascience.com/everything-you-need-to-know-about-jupyter-notebooks-10770719952b)
- More tools, such as Python libraries, will be introduced in the assistant classes.

Contenidos

Activities

Tabla 1: Time schedule

Activity	Hours/week	Slots
Lectures[a]	3 hours	Tue/Thur: 12:00-13.30
Assistant class[b]	1.5 hours	Fri: 16:15-17.45
Team and personal work	5.5 hours	-

[a] Sometimes work space with personal computer. No attendance control.
[b] Work space with personal computer. No attendance control

Basic rules

- Attendance: It's not mandatory, but it's considered important and convenient to attend lectures and assistant classes.
- Punctuality: It's a basic professional attitude. It's strongly requested to respect the start time of face-to-face and/or virtual classes.
- Behavior: It's expected to maintain an environment of good behavior, respect and camaraderie during each class.
- Dates: The course calendar is immovable. Official dates will be published in U-Cursos.
- Responsibility: Each student is responsible for his/her education (participation, programming, self-questioning, self motivation, reading, etc.) and to collaborate professionally with his/her team.

Evaluation

Personal Work

- Three controls with the same weight each.
- Involve only lectures content.
- Tentative: 6th, 10th and 15th weeks. Exact dates will soon be confirmed by the teaching committee of the DII.
- Average derives in the *Grading of Personal Work*.

Evaluation

Team Work

- Four homeworks with the same weight each.
- Developed on random teams (size to be announced)
- Involve lectures and assistant classes content.
- Dates will soon be announced.
- Average of homeworks derives in the *Grading of Team Work*.
- Evaluation includes two co-evaluations between team members. It affects on the *Final Grading of Team Work*.

Grading Policy

Personal Work & Coevaluation

- ***Grading of Personal Work***
  - $\frac{(control_1+control_2+control_3)}{3}$
- ***Coevaluation***
  - $(Coev_{Midterm} \cdot 0.3) + (Coev_{Finalterm} \cdot 0.7)$

Grading Policy

Team Work & Final Grading

- ***Grading of Team Work***
  - $\frac{(Hw_1+Hw_2+Hw_3+Hw_4)}{4}$
- ***Final Grading of Team Work***
  - $(GradingofTeamWork \cdot 0.7) + (Coevaluation \cdot 0.3)$
- ***Final Grading***
  - $(GradingofPersonalWork \cdot 0.5) + (FinalGradingofTeamWork \cdot 0.5)$

Approval Policy

Criteria

$$(\textbf{\textit{Grading of Personal Work}} \geq 4.0) \wedge (\textbf{\textit{Final Grading of Team Work}} \geq 4.0)$$

Quizzes

They only help you!

- Two quizzes before the first control.
- Three quizzes before the second control.
- Three quizzes before the third control.
- Each quiz provides 0.5 points for one question of its respective control.
- Quizzes of one control cannot be accumulated for the next one.
- Quizzes dates are random.

Worst Grade Replacement and Remedial Control Policy

Criteria

- Your worst control grade, or authorized control non-attendance, will be replaced by your second best control grade.
- - If you miss two controls, and get authorization, one of them will be replaced with a remedial control, and the other one with your second best control grade.
- If your grading of personal work is in [3.7, 3.9], you are eligible for a remedial control with 4.0 as the maximum grade.
- Remedial control will be taken after the revision of control 3 (during exam week). It is your duty to attend the remedial control in person, and to organize your agenda for it.

Thank you