COURSE: INFORMATIC APPLICATIONS

SUBJECT MATTER: Informatics

MODULE: Basic

PROGRAM: Degree in Biotechnology

SHORT DESCRIPTION AND JUSTIFICATION

Computers are an essential part of our daily life and of the professional activities of an engineer (reporting, presentations, project development, data capture and processing, resource management, simulation, documentation…)

This course aims to present the use of computers and computing techniques for science and technology. These skills are fundamental both for next courses in the program and for the forthcoming professional work of the graduates.

The course includes as its essential contents an introduction to hardware and software, the use of GUI-based operating system, use of a spreadsheet program for solving scientific and engineering problems, algorithms, structured programming, an introduction to designing and using databases, and using basic numerical and semi-numerical algorithms.

COMPETENCES

- That students demonstrate knowledge in the area of study, which is mostly constructed on the grounds of the general secondary education (high school). Even though this knowledge is usually at the level of advanced textbooks, it also includes some of the corresponding state-of-the-art (CB1).
- Be able to understand and apply general knowledge of Computer Science, Economics, Technical English, Ethics and Management to the field of Biotechnology (E2).

PREVIOUS REQUIREMENTS

CONTENTS

1. Introduction to information systems
   Hardware. Software
2. Introduction to operating systems and use of a GUI-based operating system
   Use of a graphical user interface. Files and documents management. Operating system settings management.
3. Use of a spreadsheet application
   Entering text, numbers and formulas. Use of mathematical, logical, text, search and reference functions. Use of formatting and conditional formatting.
4. Algorithms
5. Structured programming
   Introduction to Visual Basic. Visual Basic for Applications programming.

METHODOLOGY

LEARNING ACTIVITIES

<table>
<thead>
<tr>
<th>Learning Activities</th>
<th>ECTS Credits</th>
<th>Competences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lectures</td>
<td>0,6</td>
<td>CB1, E2</td>
</tr>
<tr>
<td>Case and Problem-Solving Sessions</td>
<td>0,7</td>
<td>CB1, E2</td>
</tr>
<tr>
<td>Seminars</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practical and Lab Work</td>
<td>0,7</td>
<td>E2</td>
</tr>
<tr>
<td>Presentations</td>
<td>0,1</td>
<td>E2</td>
</tr>
<tr>
<td>Personal Study</td>
<td>1,7</td>
<td>CB1, E2</td>
</tr>
<tr>
<td>Assessment Tasks (Exams, Continuous Assessment...)</td>
<td>0,2</td>
<td>CB1, E2</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>4</strong></td>
<td><strong>CB1, E2</strong></td>
</tr>
</tbody>
</table>

TEACHING METHODOLOGY

The teaching methodology used in the course relies on the availability of computers by the students. Most of the face-to-face sessions combine part of lecturing and part of practical work. This produces four different types of interactions in the classroom: expositions (content presentation), demonstrations (the instructor shows some tasks are done, or some problems are solved, and the learners follows replicating the actions on their own computer), active moments (the learners solve a problem which is later-on solved by the instructor), and autonomous work (the learners work on their pending tasks and get personal advise as needed). In this way, the learners take an active role, facilitating the acquisition of knowledge and the practice in solving problems.
The course has four blocks of practice tasks, done in groups of 2 or 3 people. There is also a group work. In the practices, the students are asked to solve a problem proposed by the teaching team. Then, they are to present and defend their work. In the groupwork, the students propose and develop a small design project of a spreadsheet application.

For the personal study, software, problem sets, on-line assessment tests, document from the face-to-face sessions and bibliographic resources are provided.

### ASSESSMENT METHODS

<table>
<thead>
<tr>
<th>Assessment methods</th>
<th>Weight</th>
<th>Competences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Exam (EF)</td>
<td>50%</td>
<td>E2</td>
</tr>
<tr>
<td>Midterm Exam/s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuous Assessment Activities (EC)</td>
<td>30%</td>
<td>CB1, E2</td>
</tr>
<tr>
<td>Reports and Presentations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lab or Field Work (PR)</td>
<td>20%</td>
<td>E2</td>
</tr>
<tr>
<td>Projects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Host Student Evaluation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### LEARNING OUTCOMES

- The student must be knowledgeable about the structure and functioning of computer systems. (→ CB1) [Continuous Assessment Activities]
- The student must be knowledgeable about the fundamental algorithmic structures and the basic procedures of the programming of computer systems, elaborating algorithms according to some requirements, analyzing the functioning of already elaborated algorithms and correcting them if necessary. (→ CB1) [Continuous Assessment Activities]
- The student must be proficient at developing calculation templates and simple computer programs for the realization of systematic calculations and / or the resolution of problems in the field of chemistry, biosciences and chemical engineering. (→ E2) [Final exam, Lab or Field Work]
QUALIFICATION

The course assessment will consider the qualifications in the practices (PR), the continuous assessment tasks (EC), the partial exams (EP), the final exam, either first or second examination period (EF), and extra credit activities (BN). All these notes will be over 10 and will have a maximum value of 10.

A grade for the practical work (NP) is obtained as a weighted average of the practices and the continuous assessment tasks: \( NP = 0.4 \text{PR} + 0.6 \text{EC} \), being both the practices (PR) and the continuous assessment (CE) the weighted average of the different activities carried out. The grade for the practical work (NP) must be greater than or equal to 4 in order to pass the course.

A retaken grade for the practical work can be obtained by making remedial practice tasks, before any final exam of the course. This retake must be asked in advance to the final exam and will be maxed to 5.

The grade of the exams (NE) will correspond to the grade of the final exam of the subject (EF). The exam grade must be greater than or equal to 4.

If either the grade for the practical work or the grade for the exams were below 4, the final grade would be the minimum of both grades.

If both the grade for the practical work (NP) and the grade for the exams (NE) are greater than or equal to 4, then the final grade of the course (CF) either in first or second examination period, is determined according to the following expression:

\[ CF = 0.5 \text{NP} + 0.5 \text{NE} \]

If and only if this grade is greater than or equal to 5, the student passes the course and the final grade is augmented with a 10% of the extra credit grade (BN): \( CF = CF + 0.1 \text{BN} \).

This extra credit grade can be obtained by doing optional tasks oriented towards improving the teaching and learning processes.

ASSESSMENT OF THE COMPETENCES

To assess competence CB1, the weighted average of the continuous assessment tasks (EC) will be used. To assess competence E2, the indicator will be the final grade of the course (CF).
BIBLIOGRAPHY


DOCUMENT HISTORY

PREVIOUS REVISIONS
March 22nd 2019, Dr. Jordi Cuadros i Dr. Xevi Biarnés

CURRENT REVISION
March 22nd 2019, Dr. Jordi Cuadros i Dr. Xevi Biarnés