390220 - CAG1 - Control and Automatisation Systems

Coordinating unit: 390 - ESAB - Barcelona School of Agricultural Engineering
Teaching unit: 707 - ESAIi - Department of Automatic Control
Academic year: 2017
Degree: MASTER’S DEGREE IN ENABLING TECHNOLOGIES FOR THE FOOD AND BIOPROCESSING INDUSTRY (Syllabus 2014). (Teaching unit Compulsory)
ECTS credits: 5  Teaching languages: Spanish, English

Teaching staff
Coordinator: ALICIA CASALS GELPI

Prior skills
Scientific and technical degrees: graduates in agricultural engineering, food science and biosystems engineering (or related fields) with degrees of a duration equal to or greater than 240 ETCS.

Requirements
Presentiality

Degree competences to which the subject contributes

Specific:
1. Developing of criteria for selection and integration of robots and automatization systems in the food sector.
2. Ability to determine the communication and processing technologies appropriate for the control, production and distribution of food and bioproducts.
3. Designing the implementation of monitoring, control and automatization for food and biotechnological industries.
   Ability to detect the points of the productive chain susceptible of automatization.

General:
4. Ability to apply the language and techniques of industrial management in the agrifood and biotechnological sector
5. Applying of commercialization systems and logistics to the agri-food and bioprocesses sector.
6. Identification of the industrial technologies with larger future impact and develop new applications of such technologies in the food and biotechnological industry.
7. Ability to indentify and use monitoring systems in quality control of food products.
8. Ability to assess and improve the design of processes and products considering social and environmental impacts.

Transversal:
9. SUSTAINABILITY AND SOCIAL COMMITMENT: Being aware of and understanding the complexity of the economic and social phenomena typical of a welfare society, and being able to relate social welfare to globalisation and sustainability and to use technique, technology, economics and sustainability in a balanced and compatible manner.
This course allows the student to get the tools and knowledge necessary to monitor, control and manage the different processes involved in a product transformation throughout the various stages, from receipt of the raw material to shipment.

### Teaching methodology

We indicate here the repertoire of teaching methods to be applied in the different training activities according to the teaching plans of the subject.

- **Lecture or conference:** presentation of knowledge by university professors or by external specialists.
- **Participatory classes:** collective solving exercises, conducted group discussions with the lecturer and other students in the classroom; classroom presentation of an activity individually or in small groups.
- **Lab / Workshop:** realization of designs, measurements, verifications, etc.; and presentation of results in oral or written form individually or in small groups.
- **Theoretical and practical works:** conducted classroom activity or exercise, individually or in small groups, with the advice of the lecturer.
- **Project or short works:** based on the realization, individually or in groups, of a work of reduced complexity or scope.
- **Information search:** Information search by students, it allows the acquisition of knowledge, skills and attitudes related to obtaining information.
- **Simulation:** Activity related to a case or problem, each student or each group is assigned a role under which they must intervene in the development of the situation.

### Learning objectives of the subject

This course allows the student to get the tools and knowledge necessary to monitor, control and manage the different processes involved in a product transformation throughout the various stages, from receipt of the raw material to shipment.

### Study load

<table>
<thead>
<tr>
<th>Total learning time: 125h</th>
<th>Hours large group: 40h</th>
<th>32.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Guided activities:</td>
<td>5h</td>
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<tr>
<td></td>
<td>Self study:</td>
<td>80h</td>
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## Content

<table>
<thead>
<tr>
<th>Chapter 1</th>
<th>Learning time: 20h</th>
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<tbody>
<tr>
<td></td>
<td>Theory classes: 20h</td>
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**Description:**


Control of discrete processes.

Justification of automation. Combinational logic system, sequential logic system. Pneumatic automation. Programmable logic controllers, GRAFCET programming, Ladder programming. Scada systems.

<table>
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<tr>
<th>Chapter 2</th>
<th>Learning time: 20h</th>
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<tbody>
<tr>
<td></td>
<td>Theory classes: 20h</td>
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</tbody>
</table>

**Description:**


## Qualification system

Ongoing assessment.

## Regulations for carrying out activities

Presentiallity. Continuous monitoring. Three deliveries and oral defenses.
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Bibliography

Basic:


Complementary:


