390321 - MICA - Food Microbiology

Coordinating unit: 390 - ESAB - Barcelona School of Agricultural Engineering
Teaching unit: 745 - EAB - Department of Agri-Food Engineering and Biotechnology
Academic year: 2019
Degree: BACHELOR'S DEGREE IN FOOD ENGINEERING (Syllabus 2009). (Teaching unit Compulsory)
BACHELOR'S DEGREE IN FOOD ENGINEERING (Syllabus 2009). (Teaching unit Compulsory)
ECTS credits: 6
Teaching languages: Catalan

Coordinator: ROSA CARBÓ MOLINER

Degree competences to which the subject contributes

Specific:
1. Basic knowledge of general microbiology
2. Basic knowledge of food biochemistry and microbiology.

Teaching methodology

The matter learning consists of lectures (large group) in which the teacher makes a speech to introduce the learning objectives related to the basic concepts of the subject. These sessions incorporate spaces for participation and involvement of students through questions and exposure of some technical-scientific topic published in the press, etc. The students participation is required in lab also. In the practical sessions the students develop typical skills of a microbiology lab, such as learning microbiological techniques, and they improve the group work learning.

Learning objectives of the subject

The students must acquire knowledge related to general and specific characteristics of the main microorganisms present in food. They must be able to differentiate the triple role that the microorganism can play in a food: a proper fermentation, a spoilage food, or can cause illness. Finally, the students should be able to deduce what are the expectable microorganisms that could be present in finished food considering raw material, the processing and the microbiological barriers.

Study load

<table>
<thead>
<tr>
<th>Total learning time: 150h</th>
<th>Hours large group:</th>
<th>40h</th>
<th>26.67%</th>
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<tbody>
<tr>
<td></td>
<td>Hours medium group:</td>
<td>0h</td>
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<tr>
<td></td>
<td>Hours small group:</td>
<td>20h</td>
<td>13.33%</td>
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<td></td>
<td>Guided activities:</td>
<td>0h</td>
<td>0.00%</td>
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<tr>
<td></td>
<td>Self study:</td>
<td>90h</td>
<td>60.00%</td>
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### SAFETY, QUALITY AND FOOD ACCEPTABILITY

**Description:**
- General principles based on safety, quality and acceptability of food
- Control applied to the food industry: HACCP

**Related activities:**
- Activity 1. Theory classes and individual written assessment
- Activity 2. Practice classes
- Activity 3. Bibliographic work

<table>
<thead>
<tr>
<th>Learning time: 30h</th>
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<tbody>
<tr>
<td>Theory classes: 15h</td>
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<tr>
<td>Laboratory classes: 5h</td>
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<tr>
<td>Self study: 10h</td>
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</tbody>
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### MICROBIOLOGICAL STUDY OF DIFFERENT FOOD GROUPS

**Description:**
- Microbiology of free waters and bottled waters. Purification and disinfectants.
- Poultry: initial microbiota and microbiology of poultry products. Eggs and egg products.
- Fishery products: initial microbiota and microbiology of derivatives. Fish fermenteds.
- Food group of low Aw: sugar, cocoa, oil, mayonnaise, margarine, spices and other condiments.

**Related activities:**
- Activity 1. Theory classes and individual written assessment
- Activity 2. Practice classes
- Activity 3. Bibliographic work

<table>
<thead>
<tr>
<th>Learning time: 60h</th>
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<tbody>
<tr>
<td>Theory classes: 25h</td>
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<tr>
<td>Laboratory classes: 15h</td>
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<tr>
<td>Self study: 20h</td>
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Planning of activities

<table>
<thead>
<tr>
<th>ACTIVITY 1: THEORETICAL CLASSES</th>
<th>Hours: 96h</th>
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<tbody>
<tr>
<td></td>
<td>Theory classes: 40h</td>
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<td>Self study: 56h</td>
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<tr>
<th>ACTIVITY 2: INDIVIDUAL EVALUATION TESTS</th>
<th>Hours: 2h</th>
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<tbody>
<tr>
<td></td>
<td>Theory classes: 2h</td>
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(ENG) ACTIVITAT 3: TREBALL DE LABORATORI

<table>
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<th>Hours: 30h</th>
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<tbody>
<tr>
<td>Laboratory classes: 20h</td>
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<tr>
<td>Self study: 10h</td>
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Description:
Laboratory practice in which a microbiological analysis of a food is carried out. At the beginning of the practice, and in groups of 3, students will prepare a script that will include the planning of the analyzes to be carried out according to the food: biomarkers to analyze, planting technique, necessary culture medium, temperature and time Reading. Once the results are obtained, a report will be made that will include the results and the interpretation of the results.

Support materials:
All the material, culture media and reagents necessary to carry out the practices.

Specific objectives:
- Work in the microbiology laboratory following the guidelines of biosafety and environmental protection.
- Perform correctly the handling operations of material used in the microbiology laboratory.
- Evaluate the results obtained from the analysis of the food and the quality of the food

ACTIVITY 4: BIBLIOGRAPHICAL WORK

<table>
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<th>Hours: 24h</th>
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<tr>
<td>Self study: 24h</td>
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Description:
Realization of a bibliographical work in groups of 3-4 students. The work will consist in the application of HACCP limited to several stages of processing a food. The necessary documentation to carry out the work will include information obtained from solvent sources (specialized books, articles, other documents prepared by prestigious entities recognized in the security system).

Specific objectives:
Evaluate the achievement of the learning objectives of the subject as well as the associated specific competences

Qualification system

The final qualification, $N_{final}$, is the sum of the partial marks:
$N_{1}$: two written tests
$N_{2}$: practices
$N_{3}$: bibliographic work
$N_{final}: 0.75N_{1} + 0.15N_{2} + 0.10N_{3}$
Regulations for carrying out activities

Attendance at lab practices is mandatory. It must bring the material indicated in the script and to be on time to the practical sessions.

Bibliography

Basic:


Others resources:

Hyperlink

Normes microbiològiques per a aliments

http://cvu.rediris.es/pub/bscw.cgi/d311175/Normicro/Recopila/normicro.htm