310026 - Budgets and Cost Control

Coordinating unit: 310 - EPSEB - Barcelona School of Building Construction
Teaching unit: 732 - OE - Department of Management
Academic year: 2018
Degree: BACHELOR’S DEGREE IN ARCHITECTURAL TECHNOLOGY AND BUILDING CONSTRUCTION (Syllabus 2015). (Teaching unit Compulsory)
BACHELOR’S DEGREE IN BUILDING CONSTRUCTION SCIENCE AND TECHNOLOGY (Syllabus 2009). (Teaching unit Compulsory)
ECTS credits: 9
Teaching languages: Catalan, Spanish

Teaching staff
Coordinator: M. BEGOÑA ANDRES BAROJA
Others: PEDRO BARINGO SABATER - JORGE CUATRECASAS DE QUEROL

Degree competences to which the subject contributes

Transversal:
1. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.

Teaching methodology
The directed learning hours consist on the one hand in teaching theoretical classes where the faculty does a brief exposition to introduce the general learning objectives related with the basic contents of the subject. Subsequently and by practical exercises the faculty tries to motivate and involve the students so that they can participate actively in their learning.
Once the basic knowledge is acquired, there will be done theoretical classes and practical exercises with specific computer software.
It is used support material in detailed teaching plan format: learning objectives by contents, concepts, examples, evaluation and directed learning activities schedule and bibliography.
On the other hand, the directed learning hours also consist on teaching practical classes, generally by means of the resolution by the students of exercises and problems, related with the specific learning objectives of each one of the subject contents.
Generally, after each session out of class tasks are proposed, which have to be worked and are the basis of the directed activities. There also have to be considered the other autonomous learning hours like the ones dedicated to the oriented readings, the resolution of the proposed problems or the questionnaires of the different contents with the virtual campus ATENEA.

Learning objectives of the subject
At the end of the subject Pressupostos i Control de Costos, the students should be able to:
1. Calculate the basic, auxiliary and split unitary prices of the construction units.
2. Write the Amidaments i Pressupostos documents of the construction projects.
3. Make the construction certificates and the end of the construction executed.
4. Analyze and do the economic control of the construcion process.
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## Study load

<table>
<thead>
<tr>
<th>Total learning time: 225h</th>
<th>Hours large group: 45h</th>
<th>20.00%</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Hours medium group: 45h</td>
<td>20.00%</td>
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<tr>
<td></td>
<td>Hours small group: 0h</td>
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<td></td>
<td>Guided activities: 0h</td>
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<tr>
<td></td>
<td>Self study: 135h</td>
<td>60.00%</td>
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</table>
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## Content

<table>
<thead>
<tr>
<th>Content 1: GENERAL CONCEPTS AND COST ANALYSIS</th>
<th>Learning time: 30h</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 6h</td>
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<tr>
<td></td>
<td>Practical classes: 6h</td>
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<tr>
<td></td>
<td>Self study: 18h</td>
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</tbody>
</table>

### Description:
- 1.1 Basic principles.
- 1.2 Measurements and budgets.
- 1.3 Cost of the materials.
- 1.4 Cost of labour.
- 1.5 Cost of the equipment.
- 1.6 Indirect cost.
- 1.7 Cost of the general outlays and profit of the company.

### Related activities:
- Theoretical explanation class.
- Activity 1. Practice of calculation of the labour cost.
- Activity 2. Practice of calculation of the indirect costs of a construction.
- Activity 5. Individual continuous evaluation questionnaire in ATENEA.
- Activity 16. Individual final exam.
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<table>
<thead>
<tr>
<th>Content 2: CRITERIA OF MEASURING AND VALORATION</th>
<th>Learning time: 135h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description:</td>
<td>Theory classes: 30h</td>
</tr>
<tr>
<td>2.1 Demolitions.</td>
<td>Practical classes: 30h</td>
</tr>
<tr>
<td>2.2 Conditioning of the land.</td>
<td>Self study: 75h</td>
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<tr>
<td>2.3 Foundations.</td>
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<tr>
<td>2.4 Structures</td>
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<tr>
<td>2.5 Bricklayer works.</td>
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<tr>
<td>2.6 Roofs and insulation.</td>
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<tr>
<td>2.7 Closings and glass.</td>
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<tr>
<td>2.8 Enclosures.</td>
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<tr>
<td>2.9 Facilities.</td>
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<tr>
<td>2.10 Urbanisation.</td>
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<tr>
<td>2.11 Restoration.</td>
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<tr>
<td>Related activities:</td>
<td></td>
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<tr>
<td>Theoretical explanation class.</td>
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<tr>
<td>Activity 3: Practice consisting on make the Budget of the matter Conditioning of the land.</td>
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<tr>
<td>Activity 4: Practice consisting on make the Budget of the matter Foundations.</td>
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<tr>
<td>Activity 5: Individual continous evaluation questionnaire in Atenea.</td>
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<tr>
<td>Activity 6: Practice consisting on make the Budget of the matter Structures.</td>
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<tr>
<td>Activity 7: Individual exam.</td>
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<tr>
<td>Activity 8: Practice consisting on make the Budget of the matter Bricklayer works.</td>
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<tr>
<td>Activity 9: Individual continous evaluation questionnaire in Atenea.</td>
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<tr>
<td>Activity 10: Practice consisting on make the Budget of the matter Roofs</td>
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<tr>
<td>Activity 11: Practice consisting on make the Budget of the matter Enclosures.</td>
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<tr>
<td>Activity 15: Individual continous evaluation questionnaire in Atenea.</td>
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<tr>
<td>Activity 16: Individual final exam.</td>
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Content 3: MANAGEMENT AND ECONOMIC CONTROL OF THE CONSTRUCTION

<table>
<thead>
<tr>
<th>Description:</th>
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</thead>
<tbody>
<tr>
<td>3.1 Study and making of an offer comparative.</td>
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<tr>
<td>3.2 Offer negotiation and price contracting.</td>
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<tr>
<td>3.3 Executed construction assessment. Certifications.</td>
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<tr>
<td>3.4 Revision of prices.</td>
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<tr>
<td>3.5 Economic control of the production.</td>
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<tr>
<td>3.6 Cost control of the executed construction.</td>
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<tr>
<td>3.7 Liquidation of the construction.</td>
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<table>
<thead>
<tr>
<th>Related activities:</th>
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<tbody>
<tr>
<td>Theoretical explanation class.</td>
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<tr>
<td>Activity 13. Practice of calculation a production system with economic incentives.</td>
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<tr>
<td>Activity 14. Practice of calculation the economic control of a construction.</td>
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<tr>
<td>Activity 15. Individual continuous evaluation questionnaire in Atenea.</td>
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<tr>
<td>Activity 16. Individual final exam.</td>
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</tbody>
</table>
### Planning of activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours</th>
<th>Description</th>
<th>Support materials</th>
<th>Specific objectives</th>
</tr>
</thead>
</table>
| **A1: PRACTICE OF CALCULATE THE LABOUR COST (CONTENT 1)** | 15h | In this practice the student learns how to calculate the company cost of the labour. | Wording with the data of the Conveni Col·lectiu of the Barcelona province. | At the end of the activity the students should be able to:  
. Calculate the cost of the labour to the company. |
| **A2: PRACTICE OF CALCULATE THE INDIRECT COSTS OF A CONSTRUCTION (CONTENT 1)** | 15h | In this practice the student studies and analyzes the indirect costs of a construction, solving a specific case, with a given planning. Besides, the student must do a new planning reducing the execution time of the construction with the aim of reducing costs. | Exercise wording. | At the end of the activity the students should be able to:  
. Calculate the indirect costs of a construction.  
. Calculate which percentage represent the indirect costs relating to the direct costs of a specific construction.  
. Reduce the budget of a construction optimizing the indirect costs. |
| **A3: PRACTICE OF CARRY OUT THE BUDGET OF THE CHAPTER OF LAND RECONDITIONING (CONTENT 2)** | 16h | Realisation of the budget of this matter, with the making of the three states nº1 Measurements, nº2 Prices and nº3 Application of Prices. |  |  |
Support materials:
Wording with the plans, the report and the required data for making the budget.

Descriptions of the assignments due and their relation to the assessment:
Resolution of the exercise by the student. Following questionnaire in ATENEA about the topic. It represents a part of the continuous evaluation (all the practices worth the 30% of the final mark of the subject).

Specific objectives:
At the end of this activity the students should be able to:
. Organise this construction chapter meeting the basic and essential requirements.
. Describe the summary of the construction units.
. Calculate according to the measurements regulations the quantifying of the construction units.
. Analyze, justify and divide the prices of the construction units.
. Calculate the budget of this construction chapter.

A4: PRACTICE OF CARRY OUT THE BUDGET OF THE FOUNDATIONS (CONTENT 2)  

Description:
Realization of the budget of this matter, with the making of the three states nº1 Measurements, nº2 Prices and nº3 Application of Prices.

Support materials:
Wording with the plans, the report and the necessary data for making the budget.

Descriptions of the assignments due and their relation to the assessment:
Resolution of the exercise by the student. Following questionnaire in ATENEA about the topic. It represents a part of the continuous evaluation (all the practices worth the 30% of the final mark of the subject).

Specific objectives:
At the end of this activity the students should be able to:
. Organise this construction chapter meeting the basic and essential requirements.
. Describe the summary of the construction units.
. Calculate according to the measurements regulations the quantifying of the construction units.
. Analyze, justify and divide the prices of the construction units.
. Calculate the budget of this construction chapter.

A5: INDIVIDUAL TESTS OF CONTINUOUS EVALUATION IN ATENEA  

Description:
Realization of the proposed practices which contain the specific learning objectives of the content. Individual fulfilment at class, by means of a questionnaire in ATENEA with auto-correction. Time and number of attempts limited. Subsequently, the faculty checks the qualifications and during the next session does a general reflection at class about the most common mistakes and the associated learning objectives which should be reinforced.

Support materials:
Questionnaire, by ATENEA.
**A6: PRACTICE OF CARRY OUT THE BUDGET OF THE STRUCTURE (CONTENT 2)**

**Description:**
Realization of the budget of this matter, with the making of the three states nº1 Measurements, nº2 Prices and nº3 Application of Prices.

**Support materials:**
Wordings with the plans, the report and the necessary data for making the budget.

**Descriptions of the assignments due and their relation to the assessment:**
Resolution of the exercise by the student. Following questionnaire in ATENEA about the topic. It represents a part of the continous evaluation (all the practices worth the 30% of the final mark of the subject).

**Specific objectives:**
At the end of this activity the students should be able to:
- Organise this construction chapter meeting the basic and essential requirements.
- Describe the summary of the construction units.
- Calculate according to the measurements regulations the quantifying of the construction units.
- Analyze, justify and divide the prices of the construction units.
- Calculate the budget of this construction chapter.

**Hours:** 19h
- Practical classes: 6h
- Self study: 7h
- Theory classes: 6h

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**A7: INDIVIDUAL TEST (CONTENT 1 AND 2)**

**Description:**
Individual exam at class with a part of the minimum essential theoretical concepts of the subject and subsequently the resolution of 2 or 3 problems related with the learning objectives of the contents.

**Support materials:**
Wordings of the two parts, calculator, encoded guide for organizing a budget, efficiency tables of the workforce, tables of materials consumption and leaflets for making a budget.

**Descriptions of the assignments due and their relation to the assessment:**
Resolution of the exam. It represents the 20% of the final mark of the subject.

**Hours:** 14h
- Self study: 11h
- Practical classes: 3h
Specific objectives:
At the end of the exam, the students should be able to:
- Organize a budget following the basic and essential requirements.
- Describe the summary of the construction units of a budget.
- Calculate according to the measuring regulations the quantifying of the construction units.
- Analyze, justify and divide the prices of the construction units of a budget.
- Calculate the contracting budget of a construction.

A8: PRACTICE OF CARRY OUT THE BUDGET OF BRICKLAYING (CONTENT 2)

Hours: 23h
Theory classes: 6h
Practical classes: 5h
Self study: 12h

Description:
Realization of the budget of this matter, with the making of the three states nº1 Measurements, nº2 Prices and nº3 Application of Prices.

Support materials:
Wordings with the plans, the report and the necessary data for making the budget.

Descriptions of the assignments due and their relation to the assessment:
Resolution of the exercise by the student. Following questionnaire in ATENEA about the topic. It represents a part of the continuous evaluation (all the practices worth the 30% of the final mark of the subject).

Specific objectives:
At the end of this activity the students should be able to:
- Organise this construction chapter meeting the basic and essential requirements.
- Describe the summary of the construction units.
- Calculate according to the measurements regulations the quantifying of the construction units.
- Analyze, justify and divide the prices of the construction units.
- Calculate the budget of this construction chapter.

A9: INDIVIDUAL TEST OF CONTINUOUS EVALUATION IN ATENEA (CONTENT 1 AND 2)

Hours: 4h
Practical classes: 1h
Self study: 3h

Description:
Realization of the proposed practices which contain the specific learning objectives of the content. Individual fulfilment at class, by means of a questionnaire in ATENEA with auto-correction. Time and number of attempts limited. Subsequently, the faculty checks the qualifications and during the next session does a general reflection at class about the most common mistakes and the associated learning objectives which should be reinforced.

Support materials:
Questionnaires, by ATENEA.

Descriptions of the assignments due and their relation to the assessment:
Questionnaires in ATENEA. It represents a part of the continuous evaluation (all the practices worth a 30% of the final mark of the subject).
**Specific objectives:**
At the end of the questionnaire, the students should be able to:
- Analyze the costs of a construction.
- Apply the regulations and techniques of the measurements.
- Calculate the measurements and budgets of the different chapters which form a budget with the unitary prices divided.

**A10: PRACTICE OF CARRY OUT THE BUDGET OF COVERS (CONTINGUT 2)**

**Description:**
Realization of the budget of this matter, with the making of the three states nº1 Measurements, nº2 Prices and nº3 Application of Prices.

**Support materials:**
Wordings with the plans, the report and the necessary data for making the budget.

**Specific objectives:**
At the end of this activity the students should be able to:
- Organise this construction chapter meeting the basic and essential requirements.
- Describe the summary of the construction units.
- Calculate according to the measurements regulations the quantifying of the construction units.
- Analyze, justify and divide the prices of the construction units.
- Calculate the budget of this construction chapter.

**Hours:** 12h
- Theory classes: 4h
- Practical classes: 2h
- Self study: 6h

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**A11: PRACTICE OF CARRY OUT THE BUDGET OF ENVELOPE AND LINING (CONTINGUT 2)**

**Description:**
Realization of the budget of this matter, with the making of the three states nº1 Measurements, nº2 Prices and nº3 Application of Prices.

**Support materials:**
Wordings with the plans, the report and the necessary data for making the budget.

**Descriptions of the assignments due and their relation to the assessment:**
Resolution of the exercise by the student. Following questionnaire in ATENEA about the topic. It represents a part of the continuous evaluation (all the practices worth the 30% of the final mark of the subject).

**Specific objectives:**
At the end of this activity the students should be able to:
- Organise this construction chapter meeting the basic and essential requirements.
- Describe the summary of the construction units.
- Calculate according to the measurements regulations the quantifying of the construction units.
- Analyze, justify and divide the prices of the construction units.
- Calculate the budget of this construction chapter.

**Hours:** 20h
- Theory classes: 5h
- Practical classes: 5h
- Self study: 10h
### Specific objectives:
At the end of this activity the students should be able to:
- Organise this construction chapter meeting the basic and essential requirements.
- Describe the summary of the construction units.
- Calculate according to the measurements regulations the quantifying of the construction units.
- Analyze, justify and divide the prices of the construction units.
- Calculate the budget of this construction chapter.

### A12: PRACTICE OF CERTIFICATIONS AND PRICE REVISION (CONTENT 3)

| Description: | With this practice the student studies and calculates the Certification and Inspection of prices of a construction. |
| Support materials: | Wording of the exercise. |
| Descriptions of the assignments due and their relation to the assessment: | Resolution of the exercise by the student. Following questionnaire in ATENEA about the topic. It represents a part of the continuous evaluation (all the practices worth the 30% of the final mark of the subject). |
| Specific objectives: | At the end of the activity the students should be able to: |
| | - Calculate the Certification of a construction. |
| | - Calculate the Inspection of prices of a construction. |

| Hours: 11h | Theory classes: 3h |
| | Practical classes: 2h |
| | Self study: 6h |

### A13: PRACTICE OF CALCULATE A PRODUCTION SYSTEM WITH ECONOMIC INCENTIVES (CONTENT 3)

| Description: | With this practice the student studies and calculates a production system with incentives in a construction. |
| Support materials: | Wording of the exercise. |
| Descriptions of the assignments due and their relation to the assessment: | Resolution of the exercise by the student. Following questionnaire in ATENEA about the topic. It represents a part of the continuous evaluation (all the practices worth the 30% of the final mark of the subject). |
| Specific objectives: | At the end of the activity, the students should be able to: |
| | - Enumerate and calculate a production system with economic incentives. |

| Hours: 11h | Theory classes: 3h |
| | Practical classes: 2h |
| | Self study: 6h |
| | Guided activities: 0h |
### A14: PRACTICE OF CALCULATE THE ECONOMIC CONTROL OF A CONSTRUCTION (CONTENT 3)

| Description: | With this practice the student studies and calculates the economic control of a part of the construction. |
| Support materials: | Wording of the exercise. |
| Descriptions of the assignments due and their relation to the assessment: | Resolution of the exercise by the student. Following questionnaire in ATENEA about the topic. It represents a part of the continuous evaluation (all the practices worth the 30% of the final mark of the subject). |
| Specific objectives: | At the end of the practice the students should be able to: |
| | . Calculate the economic control of a construction from the point of view of a building company. |

| Hours: | 13h |
| Theory classes: | 3h |
| Practical classes: | 2h |
| Self study: | 8h |
| Guided activities: | 0h |

### A15: INDIVIDUAL TESTS OF CONTINUOUS EVALUATION IN ATENEA (CONTENT 1,2,3)

| Description: | Realization of the proposed practices which contain the specific learning objectives of the content. Individual fulfilment at class, by means of a questionnaire in ATENEA with auto-correction. Time and number of attempts limited. Subsequently, the faculty checks the qualifications and during the next session does a general reflection at class about the most common mistakes and the associated learning objectives which should be reinforced. |
| Support materials: | Questionnaires, by ATENEA. |
| Descriptions of the assignments due and their relation to the assessment: | Questionnaires in ATENEA. It represents a part of the continuous evaluation (all the practices worth a 30% of the final mark of the subject). |
| Specific objectives: | At the end of the questionnaire, the students should be able to: |
| | . Make a Construction Certificate and the Liquidation of the executed construction. |
| | . Make the analysis and economic control of the construction process. |

| Hours: | 4h |
| Self study: | 3h |
| Practical classes: | 1h |

### A16: INDIVIDUAL FINAL TEST (CONTENT 1,2,3)

| Description: | Individual exam at class with a part of the minimum essential theoretical concepts of the subject and subsequently the resolution of 2 or 3 problems related with the learning objectives of the contents. |

| Hours: | 24h |
| Practical classes: | 4h |
| Self study: | 20h |
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Support materials:
Wordings of the two parts, calculator, encoded guide for organizing a budget, efficiency tables of the workforce, tables of materials consumption and leaflets for making a budget.

Descriptions of the assignments due and their relation to the assessment:
Resolution of the exam. It represents the 50% of the final mark of the subject.

Specific objectives:
At the end of the exam, the students should be able to:
- Organize a budget following the basic and essential requirements.
- Describe the summary of the construction units of a budget.
- Calculate according to the measuring regulations the quantifying of the construction units.
- Analyze, justify and divide the prices of the construction units of a budget.
- Calculate the contracting budget of a construction.
- Distinguish and compare the different offers presented by the construction contractors.
- Calculate certifications and inspections of prices.
- Enumerate and calculate a production system with economic incentives.
- Calculate the economic control of a construction from the point of view of a building company.
- Do the necessary documentation for the liquidation of a construction.

Qualification system
Practices 30%
1st Written exam 20%
2nd Final written exam 50% (includes all the contents of the subject).
The practices selected by the professor will be evaluated by means of a questionnaire for checking and valuing the achievement degree of the student.
Schedule:
ATENEA Questionnaire: week 6.
Individual exam: week 8.
ATENEA Questionnaire: week 11.
ATENEA Questionnaire: week 16.

Regulations for carrying out activities
- If some of the continuous evaluation or practical teaching activities is not done, it will be considered as non-marked.
- In any case the students can bring formularies to the exams.
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**Bibliography**

**Basic:**

**Complementary:**
- Institut de Tecnologia de la Construcció de Catalunya. Preus de referència d'edificació, de seguretat i salut, assaigs de control de qualitat i despeses indirectes .... Barcelona: ITEC, 2010.