ARCOS Group

uc3m | Universidad Carlos III de Madrid

Introduction to the course

Computer Structure

Bachelor in Computer Science and Engineering
Bachelor in Applied Mathematics and Computing
Dual Bachelor in Computer Science and Engineering and Business Administration

Introduction

- **General information about the course**
- Course development
- Evaluation system

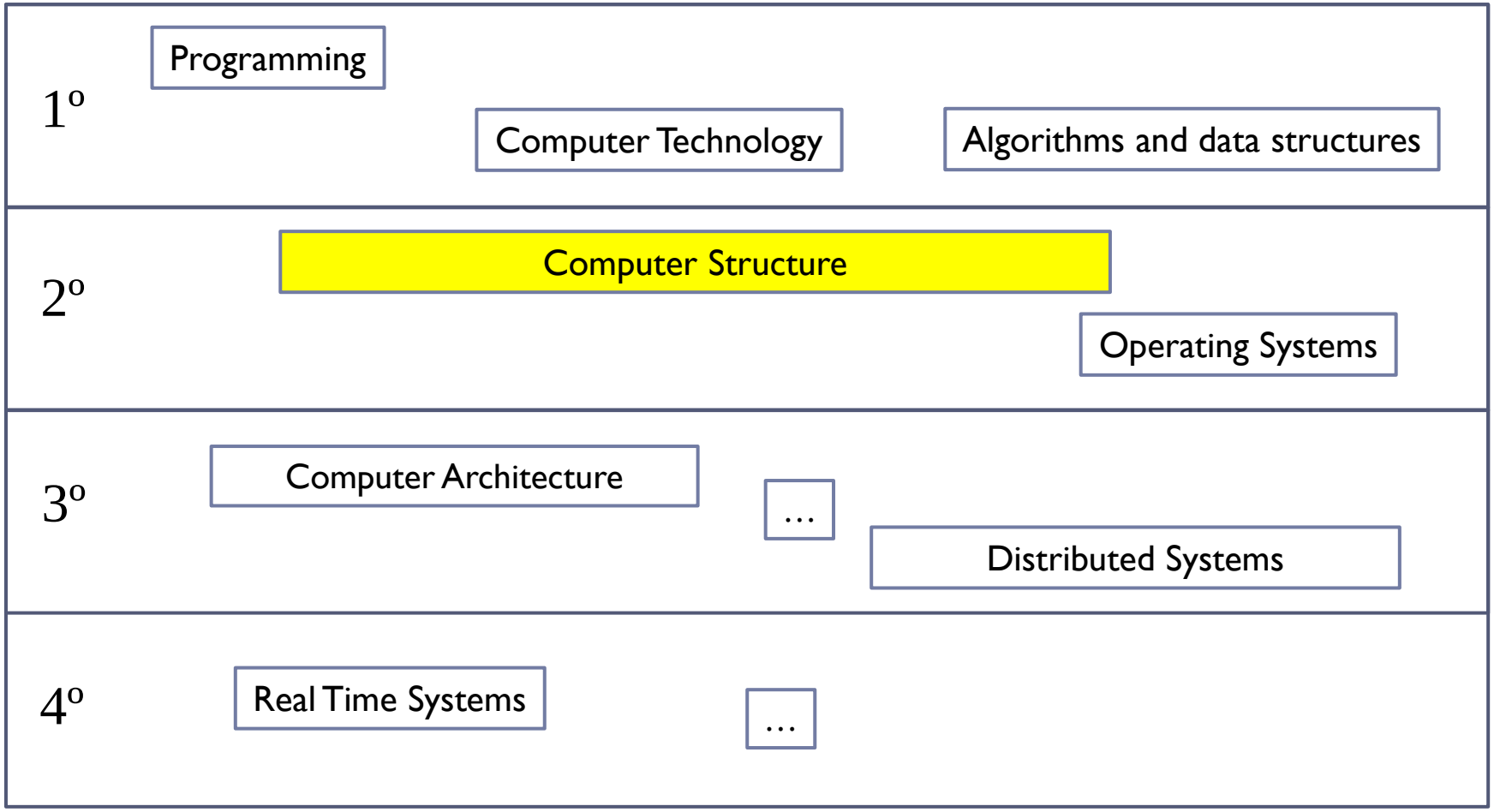
https://eligeeducar.cl/content/uploads/2017/08/metodologias-de-ensen%CC%83anza-1920x870.jpg

Computer Structure at UC3M

- This is a second-year, first-semester course that is taught in three different degree programs:
  - Bachelor in Computer Science and Engineering
  - Bachelor in Applied Mathematics and Computing
  - Dual Bachelor in Computer Science and Engineering and Business Administration

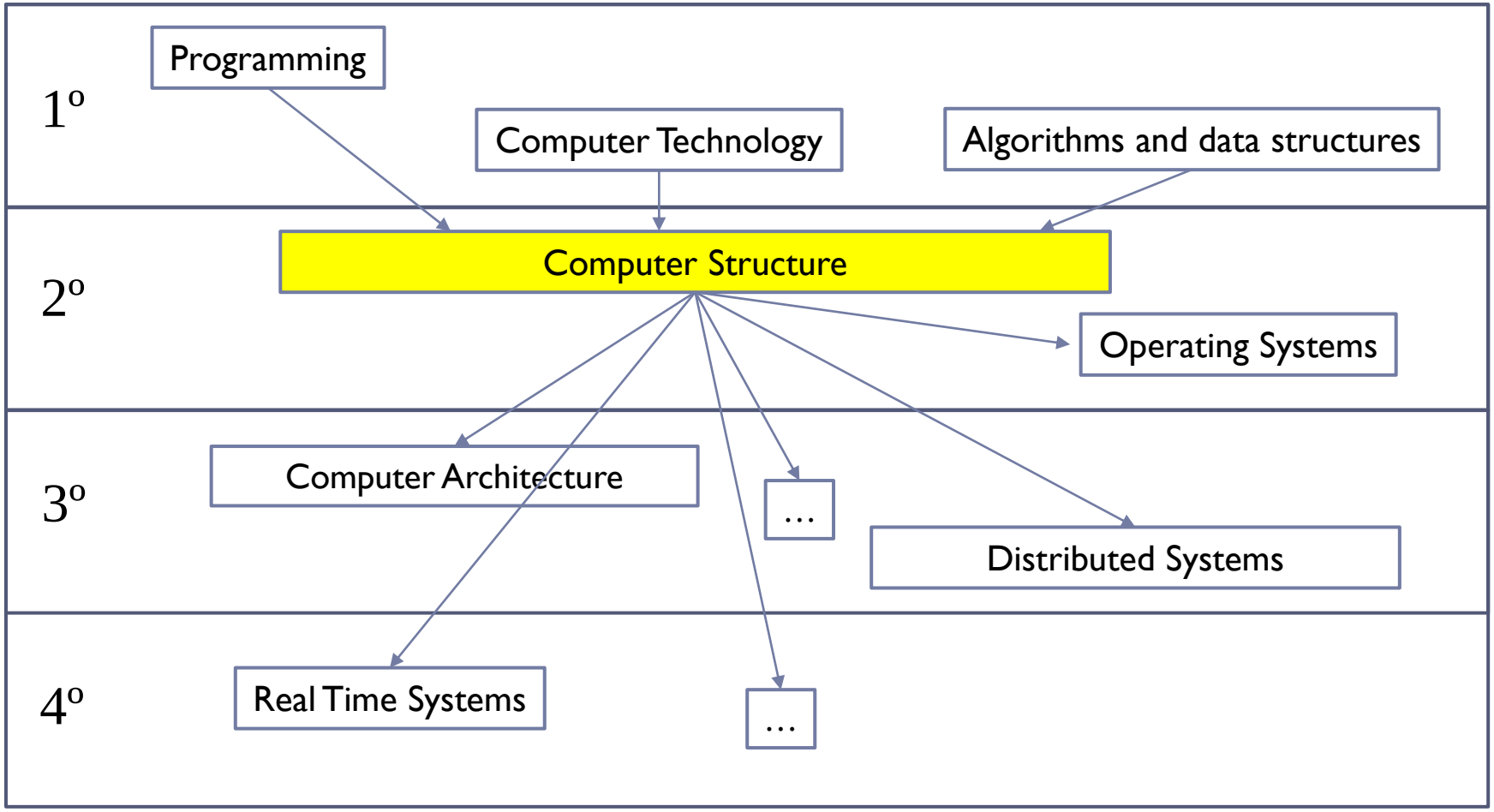
Computer Structure

Bachelor in Computer Science and Engineering



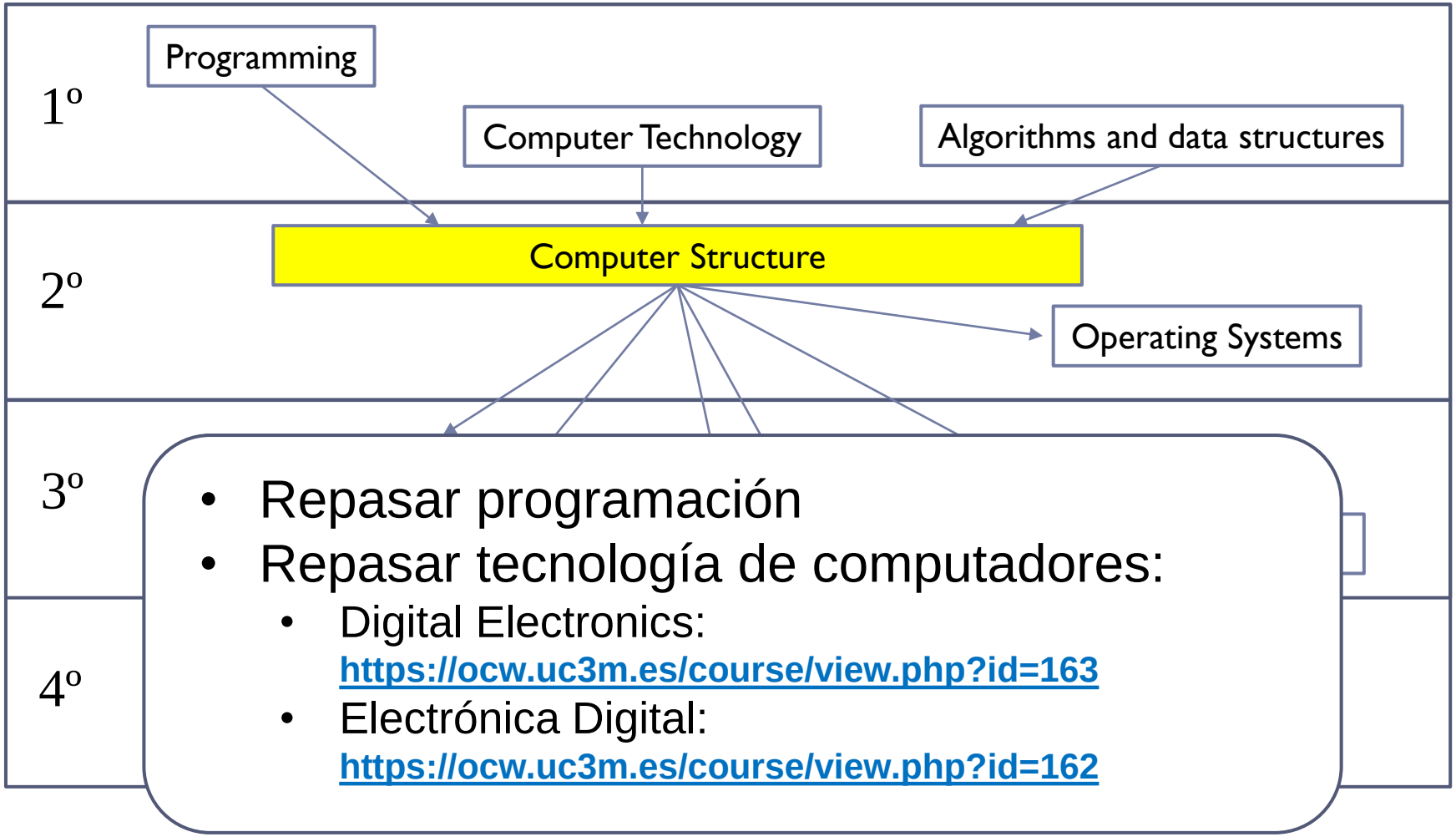
Computer Structure

Bachelor in Computer Science and Engineering



Computer Structure

Bachelor in Computer Science and Engineering



Summary course profile

- COMPUTER STRUCTURE

- **Coordinator**
- **Goals**
- **Program**
- **Bibliography**

Course profile

Coordinator

- COMPUTER STRUCTURE

- MANDATORY / BASIC INSTRUCTION
- YEAR: 2°
- QUARTER: 1°
- ECTS credits: 6

- Coordinator: Félix García Carballeira (felix.garcia@uc3m.es)

From: https://aplicaciones.uc3m.es/cpa/generaFicha?est=218&plan=489&asig=13874&idioma=1

Course profile

Goals

- COMPUTER STRUCTURE

- To know and understand
  the main components and basic operation
  of a computer (concepts behind the design of computers).

Course profile

Goals

- COMPUTER STRUCTURE

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Course profile
Goals

- COMPUTER STRUCTURE

- To know and understand
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  of a computer (concepts behind the design of computers).

Ejemplo 1

- Sea el siguiente código:

```
int n;
n = 40000;
printf("%d \n", n*n ); // 40000²

n = 50000;
printf("%d \n", n*n ); // 50000²
```

- Produce la siguiente salida:

```
1600000000
-1794967296
```

- ¿Es correcto?, ¿Cuál es el problema?

Ejemplo 2

- Sea el siguiente código:

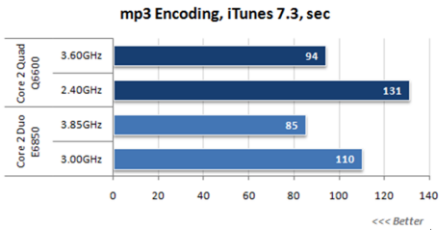
```
float x, y , z;

x = 1.0e20; y = -1.0e20; z = 3.14;

printf("%f\n", (x + y) + z);
printf("%f\n", x + (y + z));
```

- Produce la siguiente salida:

```
3.140000
0.000000
```

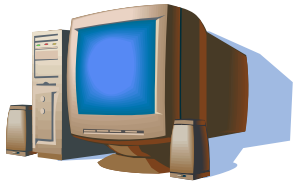
- ¿Se cumple `(x+y)+z == x+(y+z)`?

Ejemplo 3



- ¿Es más rápido un procesador con dos núcleos o un procesador con cuatro núcleos?

Example 1



- Let the following code be:

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n = 50000;
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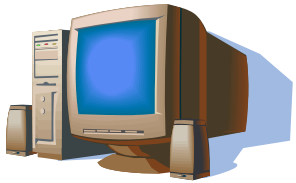
```

- It produces the following output:

```
1600000000
-1794967296
```

- Is this correct, what is the problem?

Example 2



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```

- It produces the following output:

```
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0.000000
```
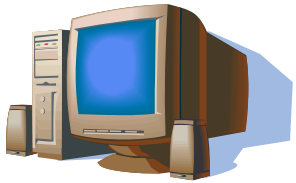
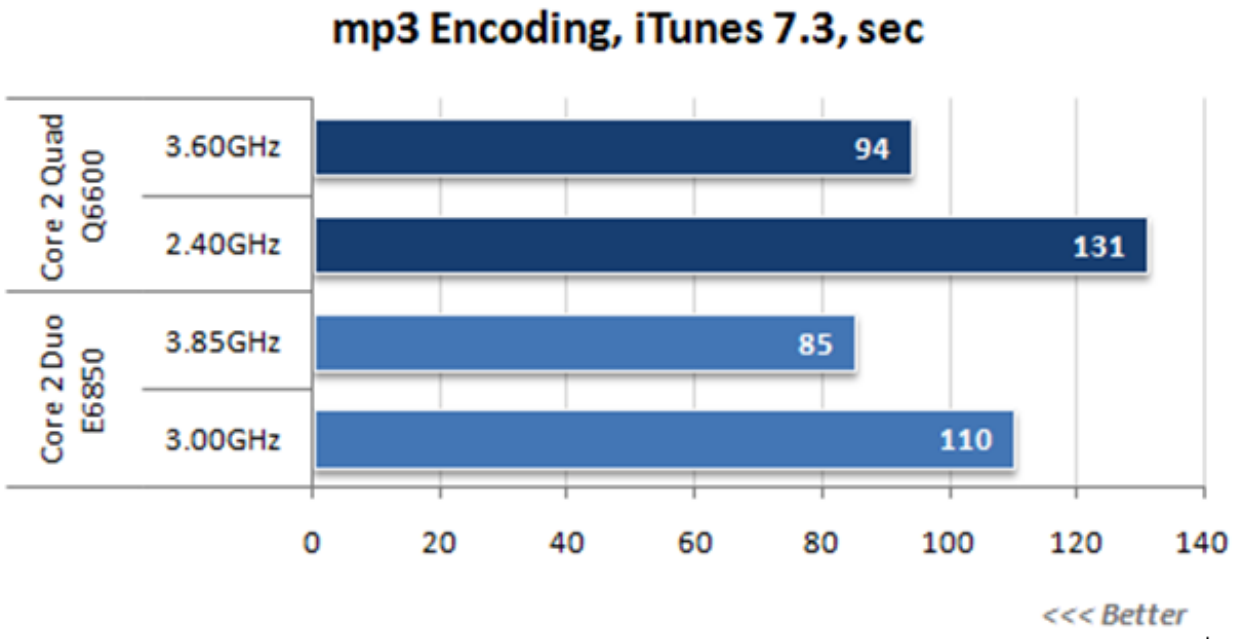

- Is `(x+y)+z == x+(y+z)` satisfied?

Example 3





- Is a dual-core processor faster than a quad-core processor?

http://www.xbitlabs.com/

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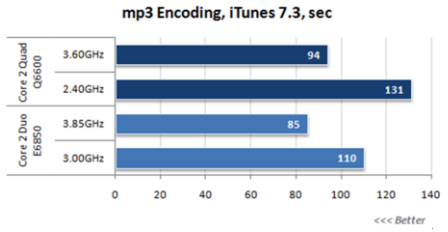
Ejemplo 3



- ¿Es más rápido un procesador con dos núcleos o un procesador con cuatro núcleos?

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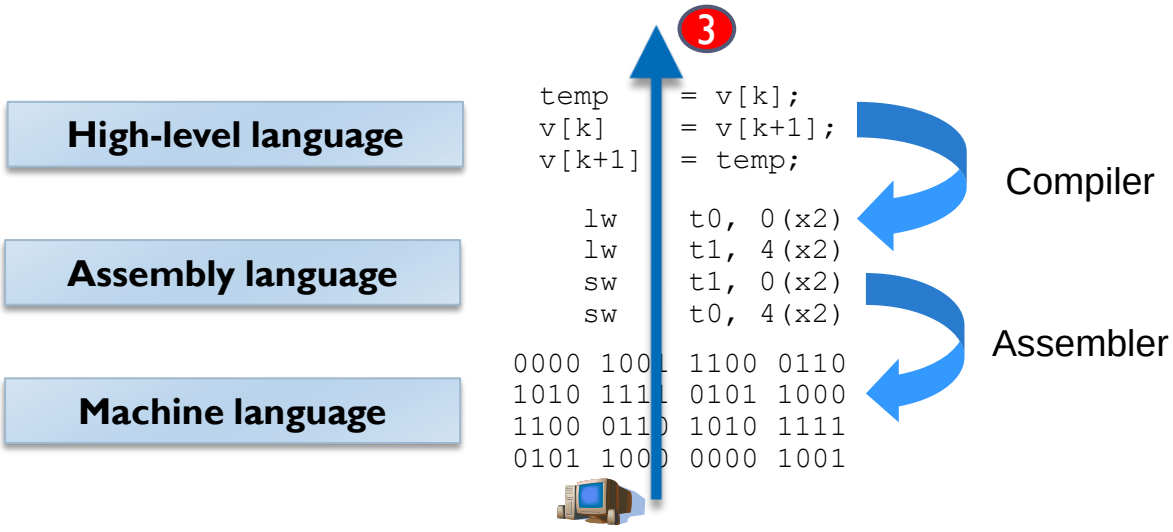


Course profile

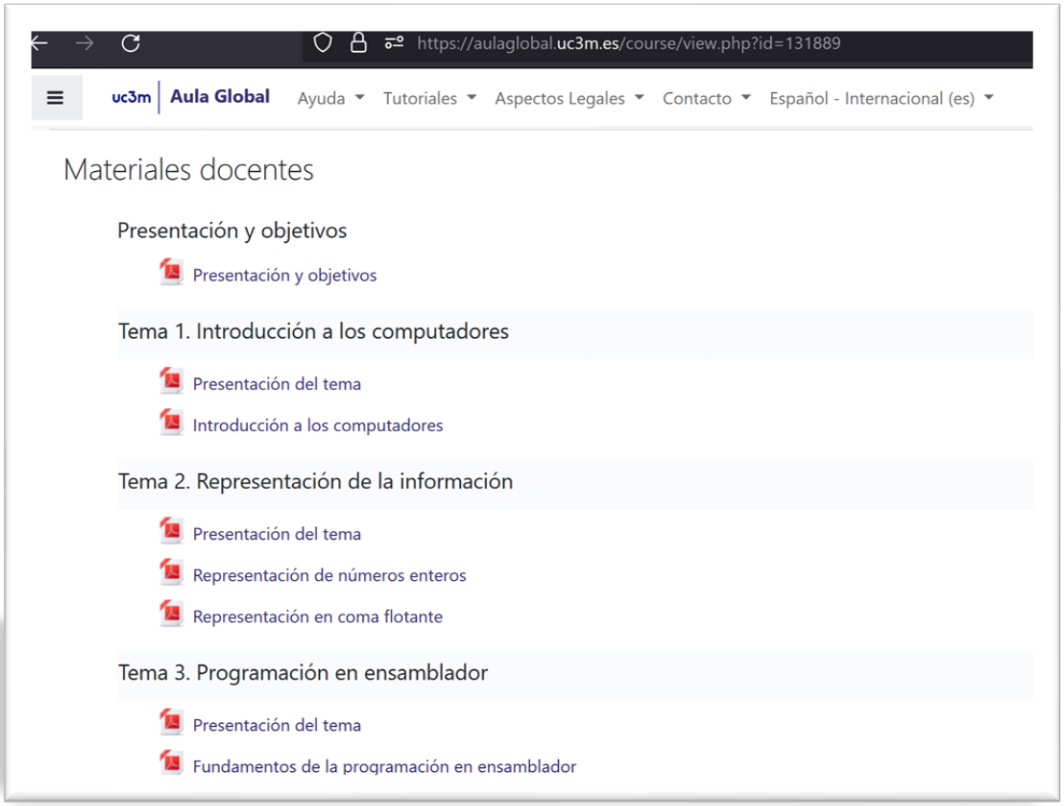
Program

- Lesson 1. Introduction to computers
- Lesson 2. Data representation and basic
- Lesson 3. Introduction to assembly programming
- Lesson 4. Processor
- Lesson 5. Memory hierarchy
- Lesson 6. Input/output systems

http://sollenbergerassociates.com/images/icon_large_clipboard.jpg

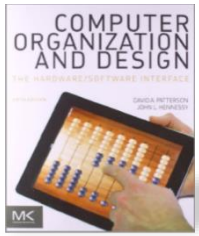
Course profile
Materials

- At Aula Global

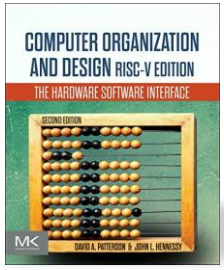


Bibliography
basic

- Problemas resueltos de Estructura de Computadores
  F. García Carballeira, J. Carretero Pérez,
  J. D. García, D. Expósito,
  Segunda edición,
  Editorial Paraninfo, 2015



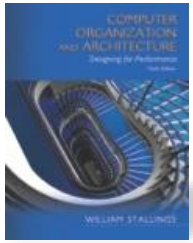
- Computer Organization and Design
  The Hardware/Software Interface
  D. A. Patterson, J. Hennessy
  Quinta edición, 2014



- Computer Organization and Design RISC-V Edition:
  The Hardware Software Interface,
  David A. Patterson, J. L. Hennessy,
  Segunda edición, 2021

Bibliography
complementary

- Fundamentos de Sistemas Digitales.
  Thomas L. Floyd
  Editorial Pearson, 2016



- Computer Organization and Architecture.
  William Stallings
  Décima edición,
  Editorial Pearson, 2016

Complementary materials

- Computer History Museum
- Museo virtual de la Informática, Universidad de Castilla-la Mancha
- https://www.computer.org/cms/Computer.org/Publications/timeline.pdf
- The EDSAC Simulator
- IBM archives
- Charles Babbage Institute
- Museo histórico de la Informática, Universidad Politécnica de Madrid

Introduction

- General information about the course
- **Course development**
- Evaluation system

https://eligeeducar.cl/content/uploads/2017/08/metodologias-de-ensen%CC%83anza-1920x870.jpg

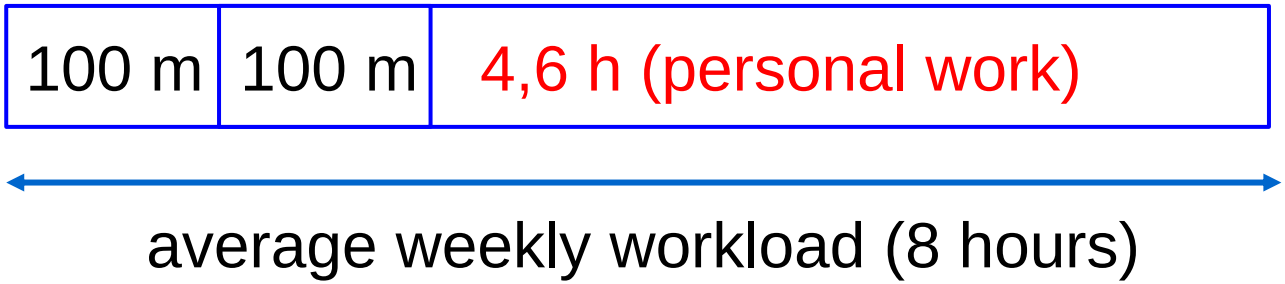
Schedule

- 14 weeks in total (presential classes)
  - 14 sessions of 100 min. in magistral group
  - 15 sessions of 100 min. in individual group
    - 4 of them are laboratories (presential)
    - 11 sessions for exercises + mini-exam + …

https://gifer.com/en/MHUp

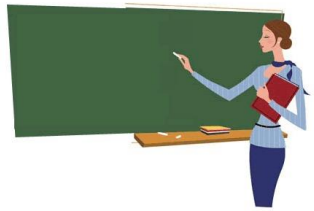
Desarrollo del curso

- 14 weeks in total (presential classes)
  - 14 sessions of 100 min. in magistral group
  - 15 sessions of 100 min. in individual group
    - 4 of them are laboratories (presential)
    - 11 sessions for exercises + mini-exam + …



Teachers and classrooms

Leganés, Bachelor on CS&E



Estructura de Computadores (cod. 13874), 6 ECTS

→ **Este es un horario general de la asignatura. Aquí puedes ver el horario completo.**
→ La información de los horarios de esta titulación ha sido generada de forma automática. Los cambios realizados durante esta jornada no se reflejarán instantáneamente.
→ La equivalencia de semanas para los horarios puede consultarla en la siguiente tabla (la fecha corresponde al lunes de la semana en cuestión).

1er Cuatrimestre	S1→ 22/08	S2→ 29/08	S3→ 05/09	S4→ 12/09	S5→ 19/09	S6→ 26/09	S7→ 03/10	S8→ 10/10	S9→ 17/10	S10→ 24/10	S11→ 31/10	S12→ 07/11	S13→ 14/11	S14→ 21/11	S15→ 28/11	S16→ 05/12	S17→ 12/12	S18→ 19/12	S19→ 26/12	S20→ 02/01	S21→ 09/01	S22→ 16/01	S23→ 23/01

Grupo 81

Responsable: GARCIA CARBALLEIRA, FELIX
Responsable grupo agregado: CALDERON MATEOS, ALEJANDRO

Mar	11:00-13:00	Semanas: 3-17	Aulas: 2.3.D02
Vie	11:00-13:00	Semanas: 3-4, 6-7, 9, 11-12, 14-17	Aulas: 1.0.F01
Vie	11:00-13:00	Semanas: 5, 8, 10, 13	Aulas: INF 1.2.G.01

Grupo 83

Responsable: CASARES ANDRES, MARIA GREGORIA
Responsable grupo agregado: CASARES ANDRES, MARIA GREGORIA

Mar	17:00-19:00	Semanas: 3-17	Aulas: 2.3.C04
Jue	17:00-19:00	Semanas: 3-4, 6-7, 9, 11-12, 14-17	Aulas: 1.0.C01
Jue	17:00-19:00	Semanas: 5, 8, 10, 13	Aulas: INF 7.0.J03 DUAL + TEL

Grupo 84

Responsable: No especificado
Responsable grupo agregado: CASARES ANDRES, MARIA GREGORIA

Mar	17:00-19:00	Semanas: 3-17	Aulas: 2.3.C04
Mie	15:00-17:00	Semanas: 3-17	Aulas: 2.3.B01

Grupo 87

Responsable: RINCON FUENTES, FRANCISCO DANIEL
Responsable grupo agregado: HERNANDEZ BRAVO, ANGEL

Mar	15:00-17:00	Semanas: 3-17	Aulas: 7.0.J06
Jue	19:00-21:00	Semanas: 3-4, 6-7, 9, 11-12, 14-17	Aulas: 7.1.H01
Jue	19:00-21:00	Semanas: 5, 8, 10, 13	Aulas: INF 7.0.J02 DUAL+ TEL

Grupo 88

Responsable: PEREZ TRAPERO, ANTONIO
Responsable grupo agregado: HERNANDEZ BRAVO, ANGEL

Mar	15:00-17:00	Semanas: 3-17	Aulas: 7.0.J06
Vie	15:00-17:00	Semanas: 3-4, 6-7, 9, 11-12, 14-17	Aulas: 1.0.B03
Vie	15:00-17:00	Semanas: 5, 8, 10, 13	Aulas: INF 1.2.G.03 DUAL

Grupo 89

Responsable: TESSIER FERNANDEZ, CARLOS
Responsable grupo agregado: HERNANDEZ BRAVO, ANGEL

Mar	15:00-17:00	Semanas: 3-17	Aulas: 7.0.J06
Jue	15:00-17:00	Semanas: 3-4, 6-7, 9, 11-12, 14-17	Aulas: 7.0.J01
Jue	15:00-17:00	Semanas: 5, 8, 10, 13	Aulas: INF 1.2.G.01

https://aplicaciones.uc3m.es/consultaHorarios/porAsignatura.htm?ano=2022&centro=2&plan=489&asignatura=13874&idioma=es

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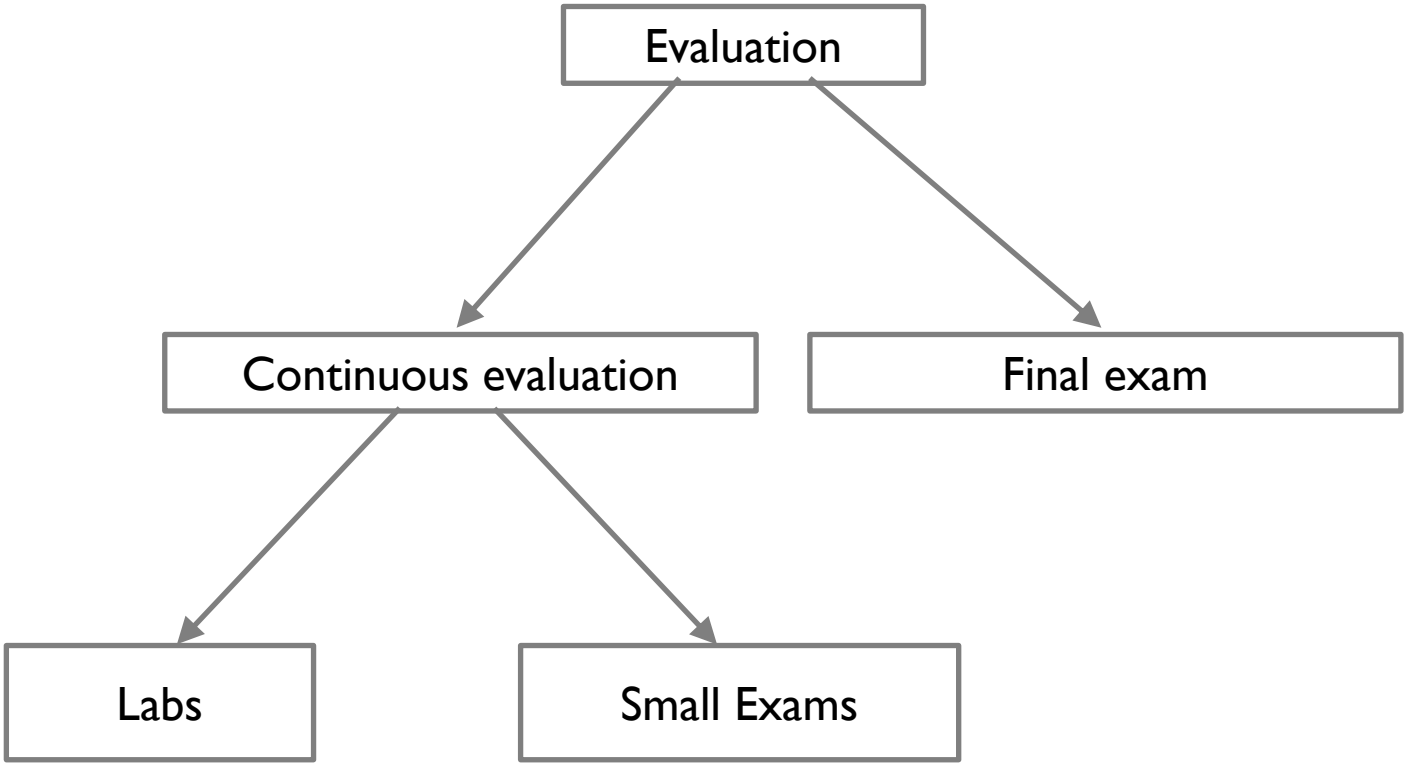
Evaluation

- The student evaluation will be based on:



Check the course profile for your bachelor studies

https://www.pngegg.com/es/png-ynlkl

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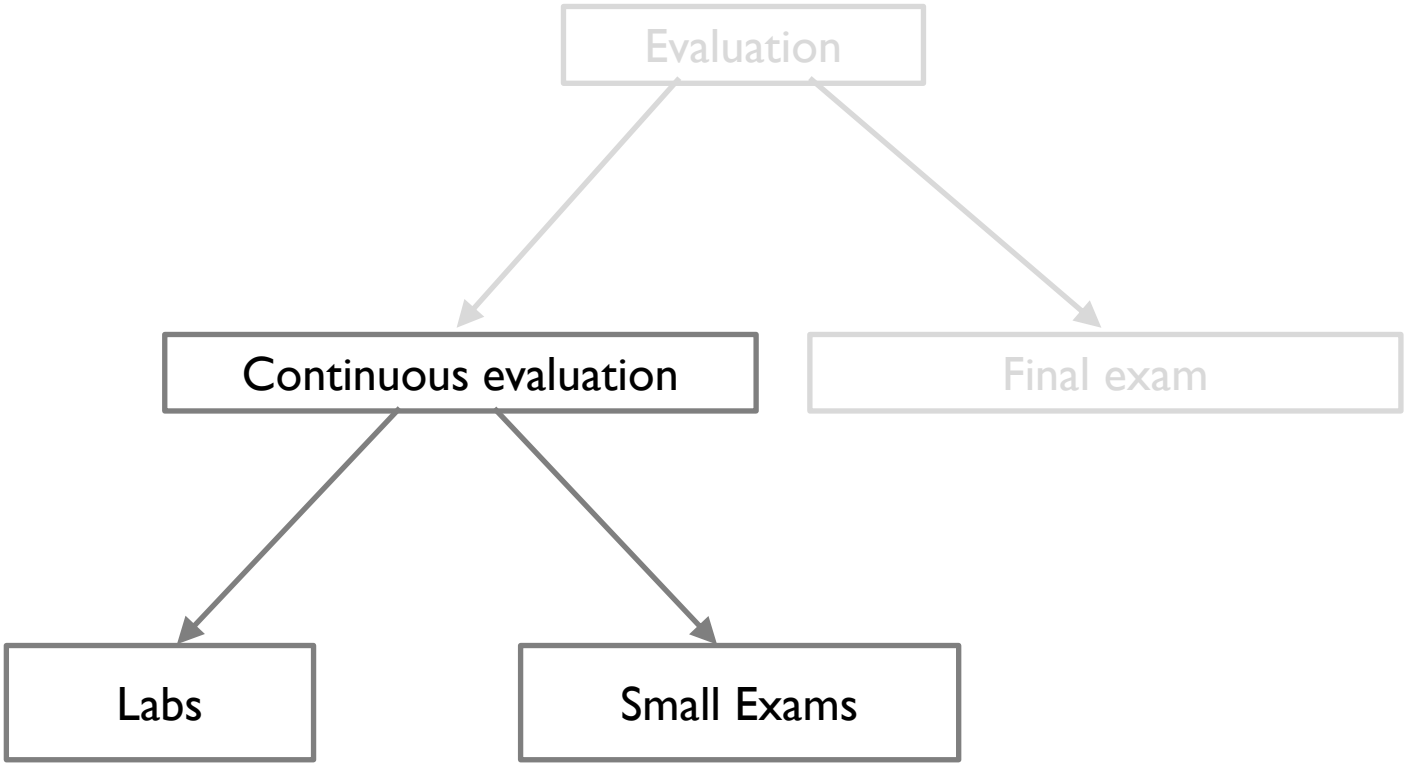

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Continuous evaluation

Labs

- TWO mandatory laboratories will be performed:
  - Minimum grade for each lab.: 2
  - Minimum average grade of all labs.: 4
- Weights of each lab.: 15%
- To be carried out in groups of two students

- If cheating is detected, both parties involved (copied and copiers) will be graded with a 0 (zero)

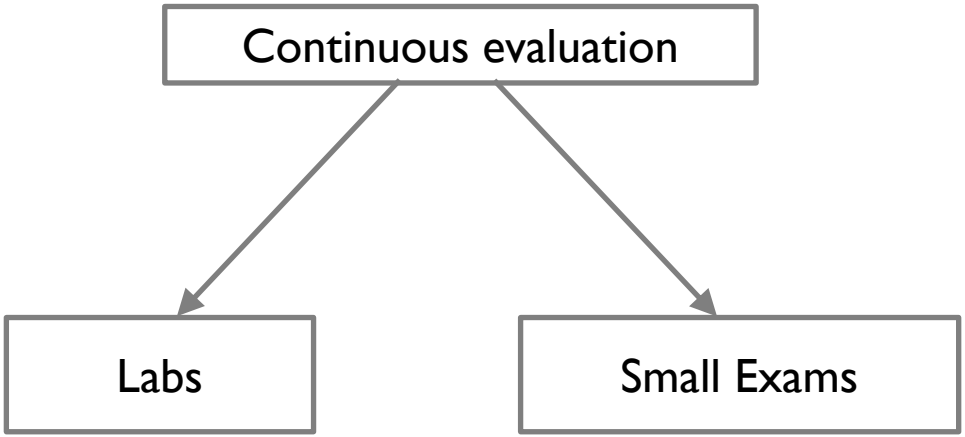
Continuous evaluation

Small Exams

- THREE small exams will be performed
  - Duration: ~15 a ~20 minutes.
  - All the knowledge acquired by the student up to that moment will be evaluated.
- Weight of each exam: 10%
- They are made individually.
- No exam will be repeated.
- Unless there is a medical reason justified sufficiently in advance, a student will not be allowed to take the exam in a group other than the one in which he/she is enrolled.

Continuous evaluation

- **Continuous evaluation is followed** when :
  - All laboratories are submitted with:
    - Minimum grade for each laboratory: 2
    - Minimum average grade for all labs: 4



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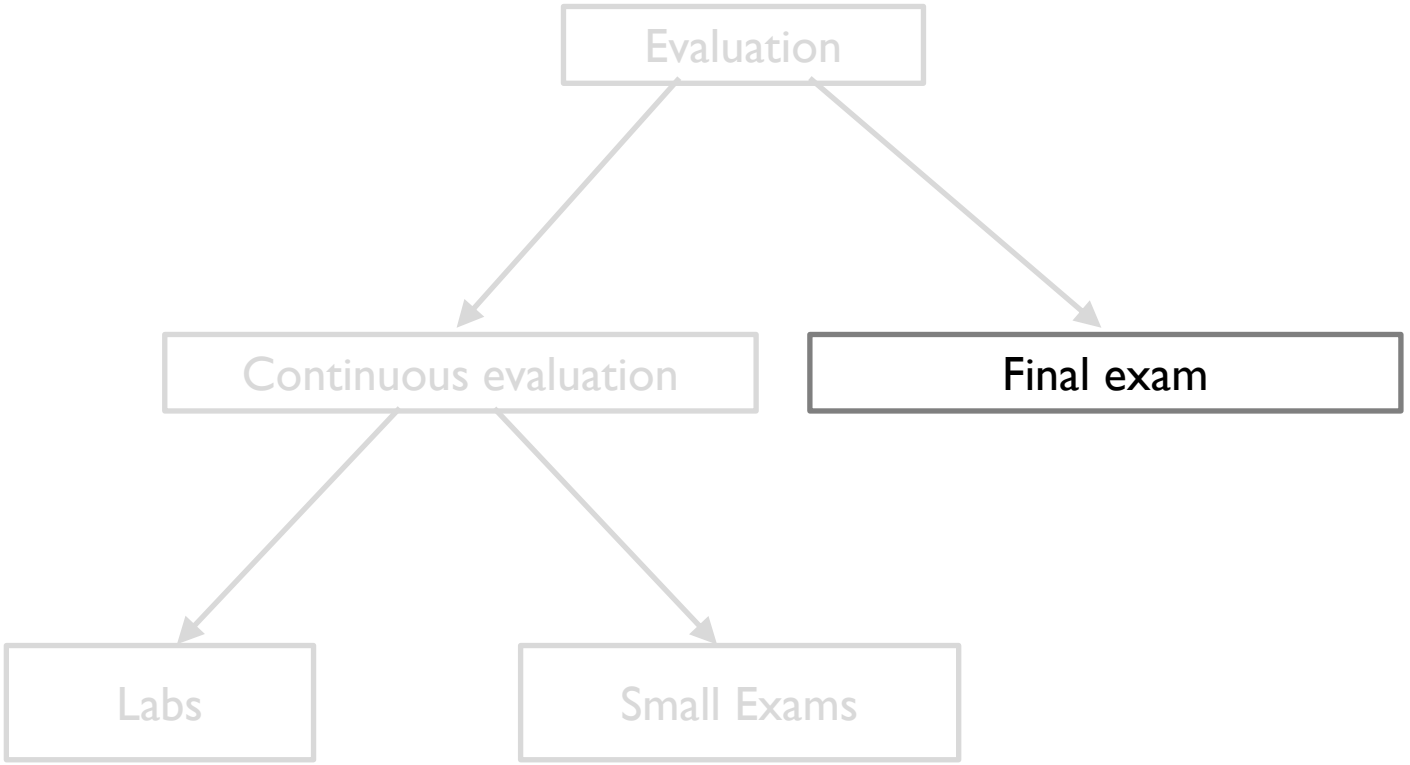

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Evaluation:
final exam

- It includes **all** the content of the subject: all the theoretical and practical content of the course
  - The minimum grade in the final exam will be **4**
  - If you do not take this exam, it will appear as **not presented** (even if you have passed the continuous evaluation).
- **No** reference material may be used for the exam, nor may it be copied.
- It will be necessary to present the ID card or university card to take the exam.

Check the course profile for your bachelor studies
https://www.pngegg.com/es/png-ynlkl

Evaluation

1. Ordinary call
   - Continuous evaluation is followed
   - No continuous evaluation is followed
2. Extraordinary call
   - Continuous evaluation is followed
   - No continuous evaluation is followed

Check the course profile for your bachelor studies

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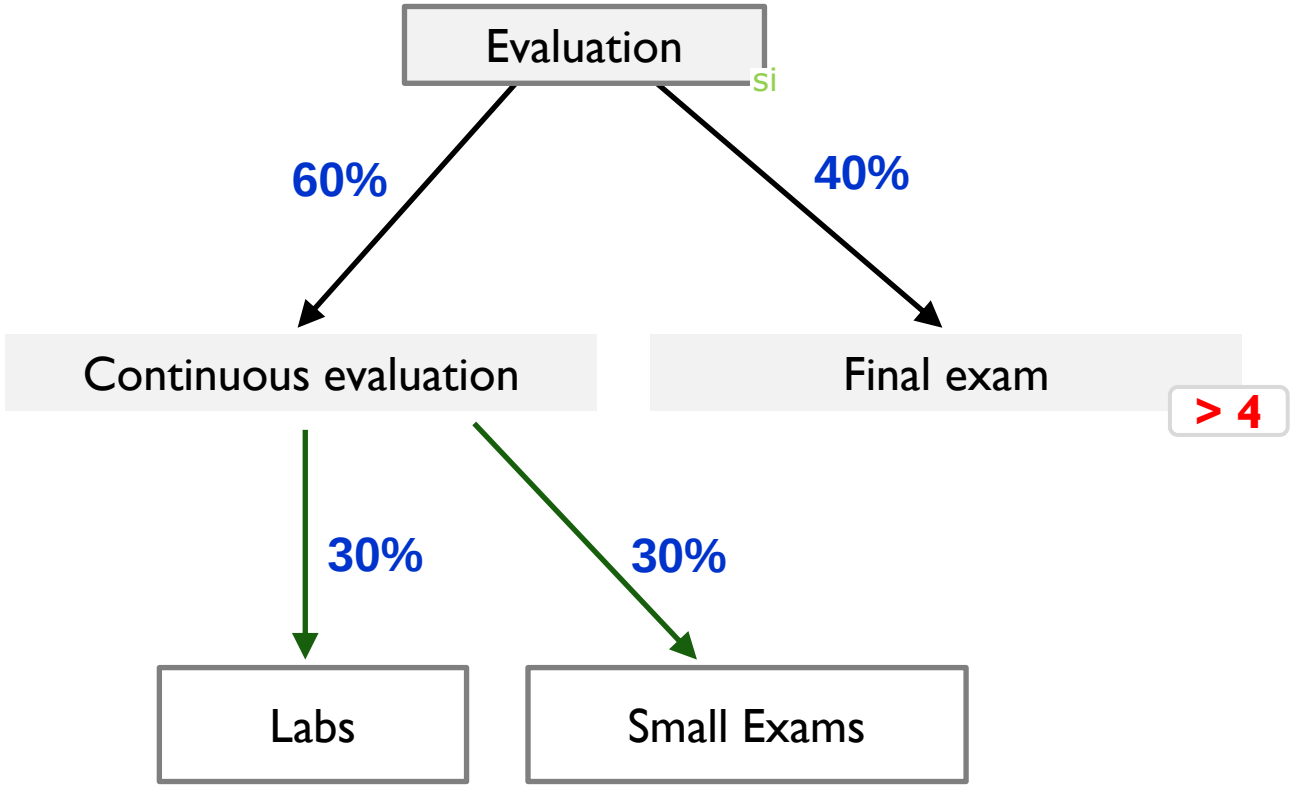
Evaluation

- Ordinary call + continuous eval. is followed:



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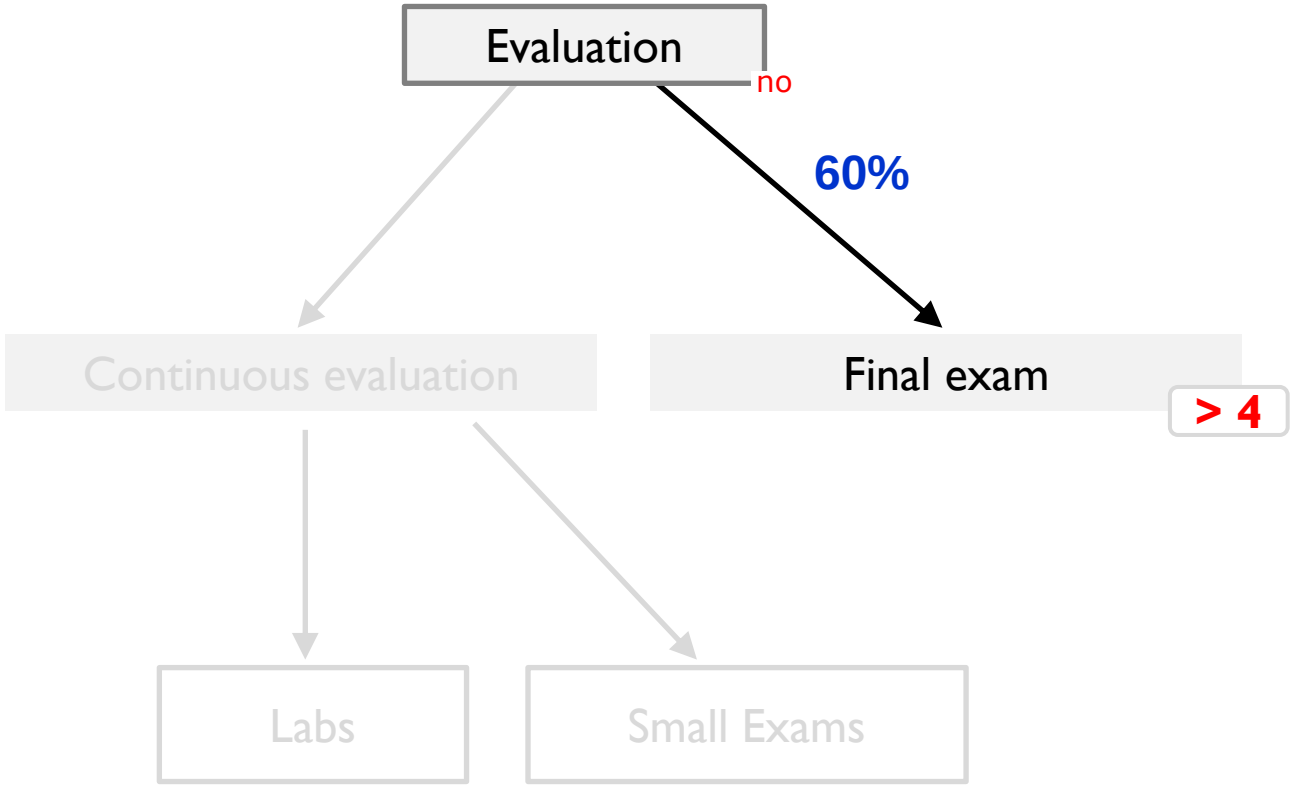

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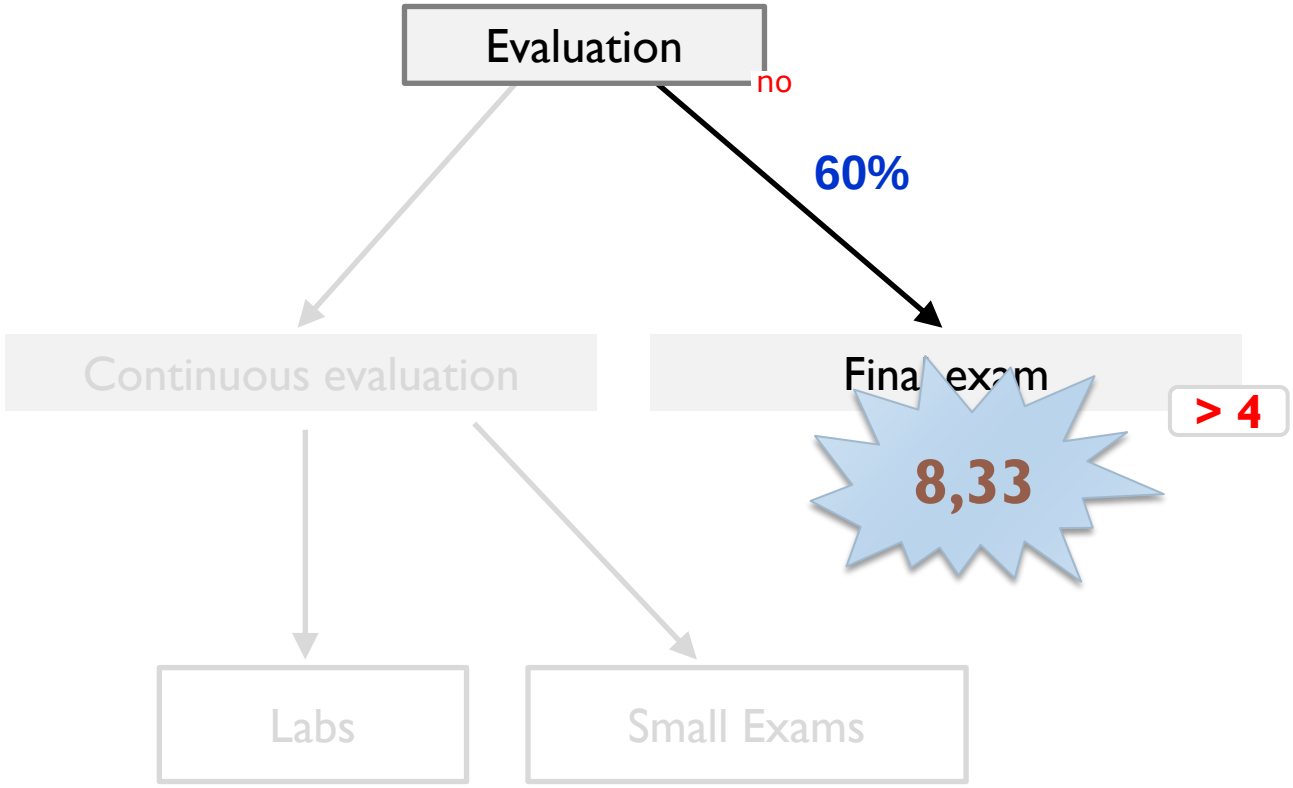

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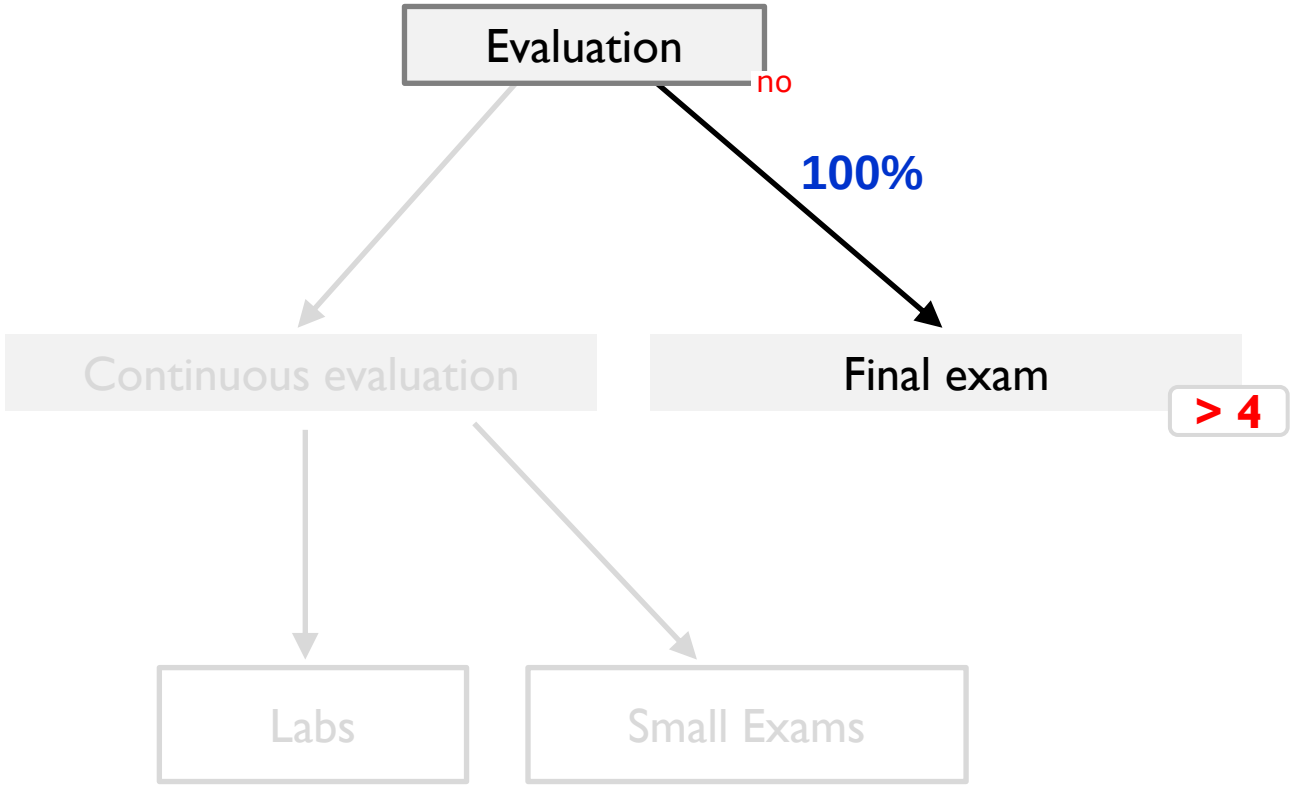

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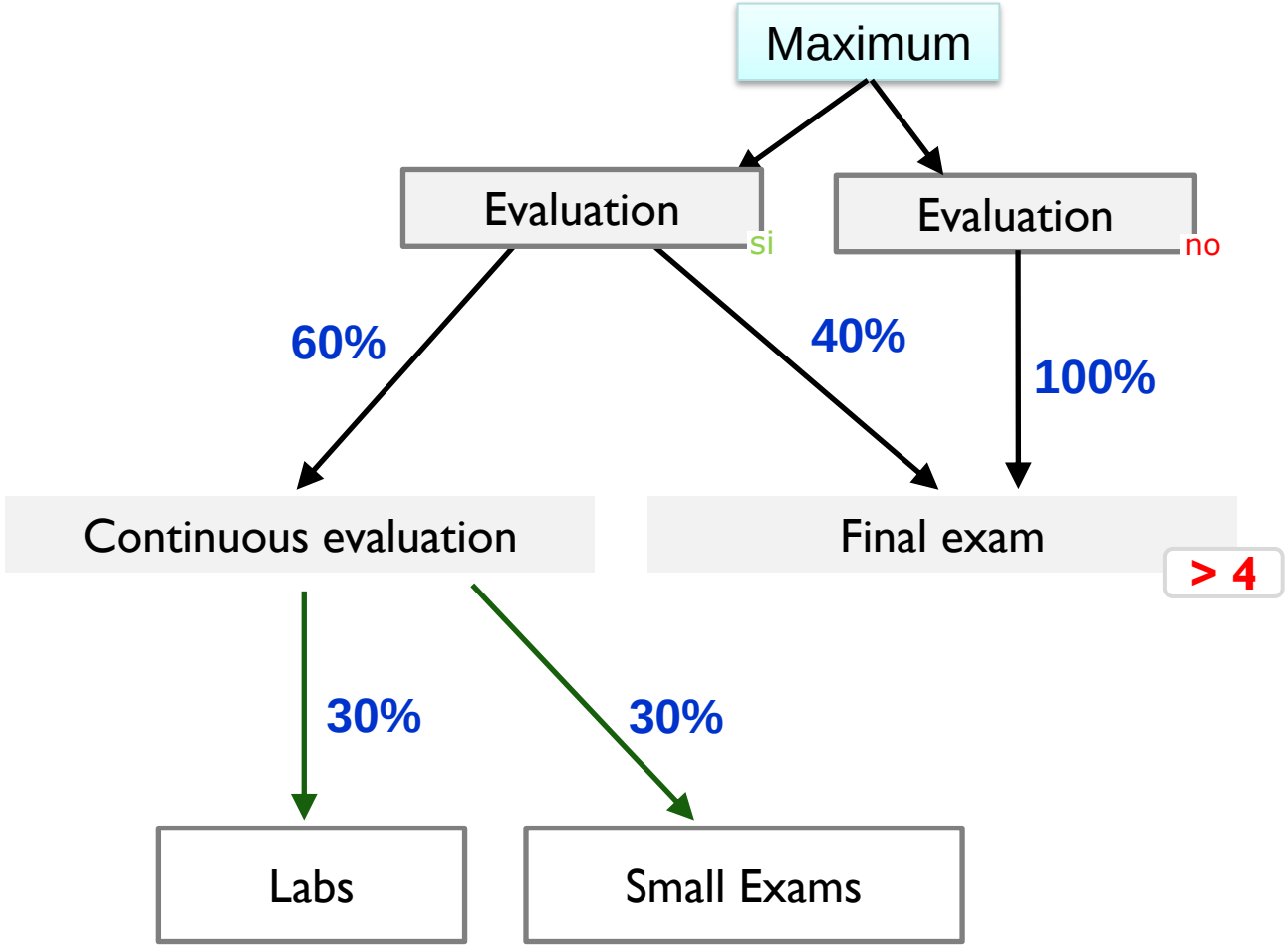

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https://www.pngegg.com/es/png-ynlkl

How important is continuous evaluation

	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
Students **following continuous assessment**	78%	74%	74%	71%	78%	88%
Students who **pass the continuous evaluation**	74%	64%	67%	66%	76%	84%
Students who pass the continuous evaluation with respect to those who follow it	87%	87%	90%	89%	89%	95%
Students **who passed** the course at the end **but dropped out of continuous assessment**	< 1 %	< 1 %	< 1 %	< 1 %	<1%	<1%
Estudiantes que **aprobaron** la **evaluación continua y** han **aprobado** la **asignatura** al final	**92%**	**89%**	**85%**	**86%**	**94%**	**90%**
Students who completed and failed the continuous evaluation have passed the course at the end of the course	6%	7%	4%	6%	2%	<1%
Approved students	**67%**	**66%**	**65%**	**62%**	**78%**	**82%**
Students not presented	**23%**	**20%**	**22%**	**26%**	**15%**	**9%**
Failing students	**10%**	**14%**	**13%**	**12%**	**7%**	**9%**

Final grade

- The final grade will be increased by 1 point for those students who perform the following activities:
  - All continuous assessment tests.
    - All the small exams
    - All the laboratories
  - Obtain more than a 7 out of 10 grade in the continuous evaluation and at least 4 out of 10 in the final exam.

ARCOS Group

uc3m | Universidad Carlos III de Madrid

Introduction to the course

Computer Structure

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