



POLITÉCNICA

INTERNATIONAL  
CAMPUS OF  
EXCELLENCE

COORDINATION PROCESS OF  
LEARNING ACTIVITIES  
PR/CL/001



E.T.S. de Ingeniería de  
Sistemas Informáticos

# ANX-PR/CL/001-01

## LEARNING GUIDE

### SUBJECT

**615000740 - Information Coding**

### DEGREE PROGRAMME

61TI - Grado En Tecnologías Para La Sociedad De La Informacion

### ACADEMIC YEAR & SEMESTER

2020/21 - Semester 1

## Index

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### Learning guide

|   |    |
|---|----|
| 1. Description.....                                     | 1  |
| 2. Faculty.....   | 1  |
| 3. Prior knowledge recommended to take the subject..... | 2  |
| 4. Skills and learning outcomes .....                   | 2  |
| 5. Brief description of the subject and syllabus.....   | 4  |
| 6. Schedule.....  | 6  |
| 7. Activities and assessment criteria.....              | 10 |
| 8. Teaching resources.....                              | 14 |
| 9. Other information.....                               | 15 |

## 1. Description

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### 1.1. Subject details

|                                       |  |
|---------------------------------------|--|
| <b>Name of the subject</b>            | 615000740 - Nformation Coding  |
| <b>No of credits</b>                  | 6 ECTS   |
| <b>Type</b>                           | Optional   |
| <b>Academic year of the programme</b> | Third year   |
| <b>Semester of tuition</b>            | Semester 5   |
| <b>Tuition period</b>                 | September-January  |
| <b>Tuition languages</b>              | English  |
| <b>Degree programme</b>               | 61TI - Grado en Tecnologías para la Sociedad de la Información       |
| <b>Centre</b>                         | 61 - Escuela Técnica Superior De Ingeniería De Sistemas Informáticos |
| <b>Academic year</b>                  | 2020-21  |

## 2. Faculty

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### 2.1. Faculty members with subject teaching role

| <b>Name and surname</b>   | <b>Office/Room</b> | <b>Email</b>   | <b>Tutoring hours *</b>  |
|---------------------------|--------------------|----------------|--|
| Luis Miguel Pozo Coronado | 2003               | lm.pozo@upm.es | Sin horario.<br>Office hours will be published before the beginning of the term, both in moodle and on the bulletin boards |

|   |             |                       |   |
|---|-------------|-----------------------|---|
| Ana Isabel Lias Quintero<br>(Subject coordinator) | 2005 / 6005 | anaisabel.lias@upm.es | Sin horario.<br>Office hours will be<br>published before<br>the beginning of the<br>term, both in<br>moodle and on the<br>bulletin boards |
|---|-------------|-----------------------|---|

\* The tutoring schedule is indicative and subject to possible changes. Please check tutoring times with the faculty member in charge.

### 3. Prior knowledge recommended to take the subject

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#### 3.1. Recommended (passed) subjects

- Logica Y Matematica Discreta
- Algebra

#### 3.2. Other recommended learning outcomes

- Understanding and writing simple mathematical proofs.
- Handling modular arithmetics and matrix calculus with ease.

### 4. Skills and learning outcomes \*

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#### 4.1. Skills to be learned

CB03 - Que los estudiantes tengan la capacidad de reunir e interpretar datos relevantes (normalmente dentro de su área de estudio) para emitir juicios que incluyan una reflexión sobre temas relevantes de índole social, científica o ética

CB04 - Que los estudiantes puedan transmitir información, ideas, problemas y soluciones a un público tanto especializado como no especializado

CE02 - Capacidad para seleccionar, diseñar, desplegar, integrar, evaluar, construir, gestionar, explotar y mantener las tecnologías de hardware, software y redes, dentro de los parámetros de coste y calidad adecuados.

CT12 - Uso de tecnologías de la información y las comunicaciones: Usar las tecnologías de la información y las comunicaciones en el ámbito de la ingeniería.

OB03 - Capacidad para diseñar, desarrollar, evaluar y asegurar la accesibilidad, ergonomía, usabilidad y seguridad de los sistemas, servicios y aplicaciones informáticas, así como de la información que gestionan.

OB08 - Conocimiento de las materias básicas y tecnológicas, que capaciten para el aprendizaje y desarrollo de nuevos métodos y tecnologías, así como las que les doten de una gran versatilidad para adaptarse a las nuevas situaciones.

OB09 - Capacidad para resolver problemas con iniciativa, toma de decisiones, autonomía y creatividad. Capacidad para saber comunicar y transmitir los conocimientos, habilidades y destrezas de la profesión de Ingeniero Técnico en Informática.

## 4.2. Learning outcomes

RA278 - Conoce y aplica protocolos de autenticación (firma digital) e intercambio de claves basados en criptosistemas de clave pública

RA280 - Conoce y aplica test de primalidad deterministas y probabilísticos

RA281 - Resuelve problemas abiertos, considerando varias alternativas posibles, valorándolas de forma razonada y argumentando su elección según los criterios especificados para su resolución. Para la alternativa elegida, identifica la información necesaria para su solución, elabora y desarrolla una estrategia eficaz para encontrarla, y presenta de forma clara el resultado y las conclusiones pertinentes

RA286 - Codifica, detecta y corrige errores utilizando los códigos lineales

RA287 - Comprime ficheros, usando códigos compresores adecuados

RA283 - Determina la complejidad computacional de algoritmos sencillos que involucren operaciones aritméticas elementales

RA282 - Distingue criptosistemas de clave pública y clave privada. Cifra y descifra utilizando los criptosistemas de traslación, afín y matricial afín

RA285 - Utiliza adecuadamente software para la resolución de problemas de codificación de la información, describiendo con precisión los protocolos utilizados

RA279 - Utiliza los distintos tipos de codificación de la información según el objetivo perseguido (corregir errores, encriptar información o comprimirla)

RA284 - Aplica los principales resultados de la teoría de números a la Criptología, cifrando y descifrando con los criptosistemas RSA y ElGamal

\* The Learning Guides should reflect the Skills and Learning Outcomes in the same way as indicated in the Degree Verification Memory. For this reason, they have not been translated into English and appear in Spanish.

## 5. Brief description of the subject and syllabus

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### 5.1. Brief description of the subject

The subject of this course is the study of the different possibilities to encode the information numerically, depending on the intended goal: conciseness (data compression), integrity (error detection codes) or security (cryptography).

The general objectives are:

- a) Understand the different mathematical concepts and tools underlying the models under consideration; and
- b) Implement these models, with special attention to efficiency and security issues.

### 5.2. Syllabus

1. Introduction to Information Coding. Cryptology
  - 1.1. Trasmisión of Information
  - 1.2. Types of codes
  - 1.3. Compression with variable-length codes: Huffman codification
    - 1.3.1. Introduction to information theory
    - 1.3.2. Huffman codification
    - 1.3.3. Minimal variance Huffman codification
  - 1.4. Cryptography and cryptosystems
    - 1.4.1. Private key cryptosystems
    - 1.4.2. Cryptanalysis
2. Computational complexity
  - 2.1. Problems and algorithms

- 2.2. Complexity of elemental arithmetic operations
- 2.3. Classification of problems regarding its complexity
- 3. Number theory
  - 3.1. The multiplicative group of integers mod  $n$
  - 3.2. Euler's totient function
  - 3.3. Euler and Fermat Theorems
  - 3.4. Order of an element. Primitive root
  - 3.5. Discrete logarithm
- 4. Public key cryptosystems
  - 4.1. Diffie- Hellman key exchange protocol
  - 4.2. RSA cryptosystem
  - 4.3. ElGamal cryptosystem
  - 4.4. Digital signature
  - 4.5. Other applications
- 5. Primality tests
  - 5.1. Deterministic tests: Erathostenes' sieve and trial division
  - 5.2. Probabilistic tests: Fermat, Miller and Miller-Rabin
- 6. Error-detection with Cyclic redundancy codes. CRC

## 6. Schedule

### 6.1. Subject schedule\*

| Week | Face-to-face classroom activities   | Face-to-face laboratory activities   | Distant / On-line | Assessment activities  |
|------|---|--|-------------------|--|
| 1    | <b>Introduction to the subject. Chapter 1</b><br>Duration: 02:00<br>Lecture | <b>Introduction to Maxima</b><br>Duration: 02:00<br>Laboratory assignments |                   | <b>Autonomous study</b><br>Other assessment<br>Continuous assessment<br>Not Presential<br>Duration: 02:00  |
| 2    | <b>Theory and/or exercises Chapter 1</b><br>Duration: 04:00<br>Lecture      |  |                   | <b>Autonomous study</b><br>Other assessment<br>Continuous assessment<br>Not Presential<br>Duration: 04:00  |
| 3    | <b>Theory and/or exercises Chapter 1</b><br>Duration: 02:00<br>Lecture      | <b>Lab project 1</b><br>Duration: 02:00<br>Laboratory assignments          |                   | <b>Lab project 1 (RA287, RA285)</b><br>Group work<br>Continuous assessment<br>Not Presential<br>Duration: 00:00<br><br><b>Moodle test. Chapter 1A (RA287, RA279)</b><br>Online test<br>Continuous assessment<br>Not Presential<br>Duration: 00:20<br><br><b>Autonomous study</b><br>Other assessment<br>Continuous assessment<br>Not Presential<br>Duration: 04:00 |
| 4    | <b>Theory and/or exercises Chapter 1</b><br>Duration: 04:00<br>Lecture      |  |                   | <b>Moodle test. Chapter 1B (RA282, RA279)</b><br>Online test<br>Continuous assessment<br>Not Presential<br>Duration: 00:20<br><br><b>Autonomous study</b><br>Other assessment<br>Continuous assessment<br>Not Presential<br>Duration: 04:00  |
| 5    | <b>Theory and/or exercises Chapter 1</b><br>Duration: 02:00<br>Lecture      | <b>Lab project 2</b><br>Duration: 02:00<br>Laboratory assignments          |                   | <b>Lab project 2 (RA282, RA285)</b><br>Group work<br>Continuous assessment<br>Not Presential<br>Duration: 00:00<br><br><b>Autonomous study</b><br>Other assessment<br>Continuous assessment<br>Not Presential<br>Duration: 04:00   |



|    |  |  |  |   |
|----|--|--|--|---|
| 6  | <p>Theory and/or exercises Chapter 2<br/>Duration: 04:00<br/>Lecture</p> |  |  | <p><b>Autonomous study</b><br/>Other assessment<br/>Continuous assessment<br/>Not Presential<br/>Duration: 04:00</p>  |
| 7  | <p>Theory and/or exercises Chapter 2<br/>Duration: 04:00<br/>Lecture</p> |  |  | <p><b>Moodle test. Chapter 2 (RA283)</b><br/>Online test<br/>Continuous assessment<br/>Not Presential<br/>Duration: 00:20</p> <p><b>Autonomous study</b><br/>Other assessment<br/>Continuous assessment<br/>Not Presential<br/>Duration: 04:00</p>  |
| 8  | <p>Theory and/or exercises Chapter 3<br/>Duration: 04:00<br/>Lecture</p> |  |  | <p><b>Written test, chapters 1 and 2 (RA279, RA282, RA283 and RA281)</b><br/>Written test<br/>Continuous assessment<br/>Presential<br/>Duration: 01:30</p> <p><b>Autonomous study</b><br/>Other assessment<br/>Continuous assessment<br/>Not Presential<br/>Duration: 02:00</p>   |
| 9  | <p>Theory and/or exercises Chapter 3<br/>Duration: 04:00<br/>Lecture</p> |  |  | <p><b>Autonomous study</b><br/>Other assessment<br/>Continuous assessment<br/>Not Presential<br/>Duration: 04:00</p>  |
| 10 | <p>Theory and/or exercises Chapter 4<br/>Duration: 02:00<br/>Lecture</p> | <p><b>Lab project 3</b><br/>Duration: 02:00<br/>Laboratory assignments</p> |  | <p><b>Lab project 3 (RA284, RA285)</b><br/>Group work<br/>Continuous assessment<br/>Not Presential<br/>Duration: 00:00</p> <p><b>Moodle test. Chapter 3 (RA284)</b><br/>Online test<br/>Continuous assessment<br/>Not Presential<br/>Duration: 00:20</p> <p><b>Autonomous study</b><br/>Other assessment<br/>Continuous assessment<br/>Not Presential<br/>Duration: 02:00</p> |
| 11 | <p>Theory and/or exercises Chapter 4<br/>Duration: 04:00<br/>Lecture</p> |  |  | <p><b>Moodle test. Chapter 4 (RA284 , RA278)</b><br/>Online test<br/>Continuous assessment<br/>Not Presential<br/>Duration: 00:20</p> <p><b>Autonomous study</b><br/>Other assessment<br/>Continuous assessment<br/>Not Presential<br/>Duration: 02:00</p>  |

|    |   |  |  |   |
|----|---|--|--|---|
| 12 | <p><b>Theory and/or exercises Chapter 5</b><br/>Duration: 02:00<br/>Lecture</p> | <p><b>Lab project 4</b><br/>Duration: 02:00<br/>Laboratory assignments</p> |  | <p><b>Lab project 4 (RA 278, RA284)</b><br/>Group work<br/>Continuous assessment<br/>Not Presential<br/>Duration: 00:00</p> <p><b>Autonomous study</b><br/>Other assessment<br/>Continuous assessment<br/>Not Presential<br/>Duration: 04:00</p>  |
| 13 | <p><b>Theory and/or exercises Chapter 5</b><br/>Duration: 04:00<br/>Lecture</p> |  |  | <p><b>Moodle test. Chapter 5 (RA280)</b><br/>Online test<br/>Continuous assessment<br/>Not Presential<br/>Duration: 00:20</p> <p><b>Autonomous study</b><br/>Other assessment<br/>Continuous assessment<br/>Not Presential<br/>Duration: 02:00</p>  |
| 14 | <p><b>Overview. Introduction to CRC</b><br/>Duration: 02:00<br/>Lecture</p>     | <p><b>Lab project 5</b><br/>Duration: 02:00<br/>Laboratory assignments</p> |  | <p><b>Lab project 5 (RA 285, RA280)</b><br/>Group work<br/>Continuous assessment<br/>Not Presential<br/>Duration: 00:00</p> <p><b>Autonomous study</b><br/>Other assessment<br/>Continuous assessment<br/>Not Presential<br/>Duration: 04:00</p>  |
| 15 |   |  |  | <p><b>Written test, chapters 3,4, and 5 (RA284, RA278, RA280 and RA281)</b><br/>Written test<br/>Continuous assessment<br/>Presential<br/>Duration: 01:30</p> <p><b>Autonomous study</b><br/>Other assessment<br/>Continuous assessment<br/>Not Presential<br/>Duration: 04:00</p>                                  |
| 16 |   |  |  |   |
| 17 |   |  |  | <p><b>Lab test (RA284, RA278, RA280, RA285)</b><br/>Problem-solving test<br/>Continuous assessment<br/>Presential<br/>Duration: 01:00</p> <p><b>Final exam (RA278, RA279, RA280, RA281, RA282, RA283, RA284, RA285, RA286, RA287)</b><br/>Written test<br/>Final examination<br/>Presential<br/>Duration: 03:00</p> |

Depending on the programme study plan, total values will be calculated according to the ECTS credit unit as 26/27

hours of student face-to-face contact and independent study time.

\* The schedule is based on an a priori planning of the subject; it might be modified during the academic year, especially considering the COVID19 evolution.

## 7. Activities and assessment criteria

### 7.1. Assessment activities

#### 7.1.1. Continuous assessment

| Week | Description                            | Modality         | Type          | Duration | Weight | Minimum grade | Evaluated skills             |
|------|--|------------------|---------------|----------|--------|---------------|------------------------------|
| 1    | Autonomous study                       | Other assessment | No Presential | 02:00    | %      | / 10          |                              |
| 2    | Autonomous study                       | Other assessment | No Presential | 04:00    | %      | / 10          |                              |
| 3    | Lab project 1 (RA287, RA285)           | Group work       | No Presential | 00:00    | 6%     | / 10          | OB08<br>CE02<br>OB03<br>CT12 |
| 3    | Moodle test. Chapter 1A (RA287, RA279) | Online test      | No Presential | 00:20    | 2%     | 7 / 10        | OB03<br>OB08<br>CB03<br>CE02 |
| 3    | Autonomous study                       | Other assessment | No Presential | 04:00    | %      | / 10          |                              |
| 4    | Moodle test. Chapter 1B (RA282, RA279) | Online test      | No Presential | 00:20    | 2%     | 7 / 10        |                              |
| 4    | Autonomous study                       | Other assessment | No Presential | 04:00    | %      | / 10          |                              |
| 5    | Lab project 2 (RA282, RA285)           | Group work       | No Presential | 00:00    | 6%     | / 10          | OB03<br>CT12<br>OB08<br>CE02 |
| 5    | Autonomous study                       | Other assessment | No Presential | 04:00    | %      | / 10          |                              |
| 6    | Autonomous study                       | Other assessment | No Presential | 04:00    | %      | / 10          |                              |
| 7    | Moodle test. Chapter 2 (RA283)         | Online test      | No Presential | 00:20    | 2%     | 7 / 10        | OB03<br>OB08<br>CB03<br>CE02 |
| 7    | Autonomous study                       | Other assessment | No Presential | 04:00    | %      | / 10          |                              |

|    |   |                  |               |       |     |        |  |
|----|---|------------------|---------------|-------|-----|--------|--|
| 8  | Written test, chapters 1 and 2 (RA279, RA282, RA283 and RA281)    | Written test     | Face-to-face  | 01:30 | 16% | / 10   | OB03<br>OB08<br>OB09<br>CB03<br>CB04<br>CE02 |
| 8  | Autonomous study  | Other assessment | No Presential | 02:00 | %   | / 10   |  |
| 9  | Autonomous study  | Other assessment | No Presential | 04:00 | %   | / 10   |  |
| 10 | Lab project 3 (RA284, RA285)                                      | Group work       | No Presential | 00:00 | 6%  | / 10   | OB03<br>CT12<br>OB08<br>CE02                 |
| 10 | Moodle test. Chapter 3 (RA284)                                    | Online test      | No Presential | 00:20 | 2%  | 7 / 10 | OB03<br>OB08<br>CB03<br>CE02                 |
| 10 | Autonomous study  | Other assessment | No Presential | 02:00 | %   | / 10   |  |
| 11 | Moodle test. Chapter 4 (RA284 , RA278)                            | Online test      | No Presential | 00:20 | 2%  | 7 / 10 | OB03<br>OB08<br>CB03<br>CE02                 |
| 11 | Autonomous study  | Other assessment | No Presential | 02:00 | %   | / 10   |  |
| 12 | Lab project 4 (RA 278, RA284)                                     | Group work       | No Presential | 00:00 | 6%  | / 10   | OB03<br>CT12<br>OB08<br>CE02                 |
| 12 | Autonomous study  | Other assessment | No Presential | 04:00 | %   | / 10   |  |
| 13 | Moodle test. Chapter 5 (RA280)                                    | Online test      | No Presential | 00:20 | 2%  | 7 / 10 | OB03<br>OB08<br>CB03<br>CE02                 |
| 13 | Autonomous study  | Other assessment | No Presential | 02:00 | %   | / 10   |  |
| 14 | Lab project 5 (RA 285, RA280)                                     | Group work       | No Presential | 00:00 | 6%  | / 10   |  |
| 14 | Autonomous study  | Other assessment | No Presential | 04:00 | %   | / 10   |  |
| 15 | Written test, chapters 3,4, and 5 (RA284, RA278, RA280 and RA281) | Written test     | Face-to-face  | 01:30 | 22% | 0 / 10 | OB03<br>OB08<br>OB09<br>CB03<br>CB04<br>CE02 |

|    |                                       |                      |               |       |     |        |                                      |
|----|---------------------------------------|----------------------|---------------|-------|-----|--------|--------------------------------------|
| 15 | Autonomous study                      | Other assessment     | No Presential | 04:00 | %   | / 10   |                                      |
| 17 | Lab test (RA284, RA278, RA280, RA285) | Problem-solving test | Face-to-face  | 01:00 | 20% | 0 / 10 | OB03<br>CT12<br>OB08<br>OB09<br>CE02 |

### 7.1.2. Final examination

| Week | Description   | Modality     | Type         | Duration | Weight | Minimum grade | Evaluated skills                                     |
|------|---|--------------|--------------|----------|--------|---------------|--|
| 17   | Final exam (RA278, RA279, RA280, RA281, RA282, RA283, RA284, RA285, RA286, RA287) | Written test | Face-to-face | 03:00    | 100%   | 5 / 10        | OB03<br>CT12<br>OB08<br>OB09<br>CB03<br>CB04<br>CE02 |

### 7.1.3. Referred (re-sit) examination

| Description   | Modality     | Type         | Duration | Weight | Minimum grade | Evaluated skills                                     |
|---|--------------|--------------|----------|--------|---------------|--|
| Final exam (RA278, RA279, RA280, RA281, RA282, RA283, RA284, RA285, RA286, RA287) | Written test | Face-to-face | 02:30    | 100%   | 5 / 10        | CT12<br>OB03<br>OB08<br>OB09<br>CB03<br>CB04<br>CE02 |

## 7.2. Assessment criteria

### **Continuous evaluation:**

**Online tests:** One for each chapter; 10 multiple choice questions. If the result is at least 7/10, the test will add 2% to the final grade, up to 10% altogether.

**Written tests:** They take place in normal lecture hours. The students must answer to questions regarding subject contents (including definitions, statements of theorems, exercises and problems). At least 70% of assessment will correspond to basic contents. Language precision and rigour in the results will be demanded.

**Lab projects:** 5 lab projects must be done along the term. Work will be done in pairs. The contribution of each project to the final grade will be 6%. Project assessment: Procedures, 50% (efficiency, clarity, documentation); solved problems, 40%; mathematical rigour, elegance, language precision, 10%.

**Lab test:** A validation test will take place in the lab, where some problems must be solved by using the functions programmed in the lab projects. This test will weigh a 20% of the total grade.

### **Final exam only, and july examination session**

Students choosing the final exam option must apply for it before November 24th, using the tool in Moodle. Final exam will take place as scheduled by the school administration. The exam will have two parts: a written test regarding subject contents (including definitions, statements of theorems, exercises and problems), and a lab test where some problems must be solved by means of the functions listed in the lab projects (which each student must do in advance and bring to the exam). Each part will weigh 70% and 30% of the final grade, respectively. The function list and specifications will be published in Moodle.

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## **ADDENDUM**

Developing the UPM Evaluation Policy, subject teachers state that:

1. For a student to be examined on a date other than the scheduled exam, it must necessarily be verified the following circumstances:
  - (a) The reason the student is unable to attend the exam must be overselling and force majeure, legally established or sufficiently estimated by the Head of Studies. The concept of force majeure must be understood as the existence of an unpredictable external cause affecting the sufferer by preventing the fulfilment of an obligation.
  - (b) In these cases, in order for the test to take effect on a different date and time than the scheduled one, affected students must notify the coordinator, via email or telephone, no later than 48 hours and send the documents that prove the reason he/she were unable to attend. Otherwise, the test will not be re-tested.
2. If a copy is detected on any ongoing evaluation test, the students involved will have zero rating in the ordinary call. In addition, they will need to conduct a review defense in a oral procedure in the extraordinary call.

If there exists a copy in the extraordinary examination, the facts will be reported to the Rector for the opening of a

disciplinary file.

## 8. Teaching resources

### 8.1. Teaching resources for the subject

| Name  | Type         | Notes |
|---|--------------|-------|
| Buchmann, Johannes A:<br>"Introduction to Cryptography".<br>Second Edition. Springer-Verlag.<br>2004.   | Bibliography |       |
| Koblitz, Neal: "A Course in Number<br>Theory and Cryptography". Second<br>Edition. Springer-Verlag. 1994  | Bibliography |       |
| Lucena, Manuel José: "Criptografía y<br>Seguridad en Computadores". 1999.<br><a href="http://www.di.ujaen.es/~mlucena">www.di.ujaen.es/~mlucena</a> | Web resource |       |
| Munuera, Carlos; Tena, Juan:<br>"Codificación de la Información".<br>Universidad de Valladolid. 1997  | Bibliography |       |
| Ramió, Jorge: "Aplicaciones<br>Criptográficas". Escuela Universitaria<br>de Informática. U. Politécnica de<br>Madrid. 1998                          | Bibliography |       |
| Trappe, Wade; Washington,<br>Lawrence C.: "Introduction to<br>Cryptography with Coding Theory".<br>Prentice-Hall. 2002                              | Bibliography |       |
| Maxima handbook: <a href="http://maxima.sourceforge.net/docs/manual/es/maxima.html">http://maxima.sourceforge.net/docs/manual/es/maxima.html</a>    | Web resource |       |



|   |              |   |
|---|--------------|---|
| UPM Moodle environment: <a href="http://moodle.upm.es/titulaciones/oficiales/">http://moodle.upm.es/titulaciones/oficiales/</a> | Web resource | Containing course info and additional resources |
| Lab resources: PCs  | Equipment    |   |
| Software: Maxima, Maple   | Equipment    |   |

## 9. Other information

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### 9.1. Other information about the subject

En previsión de posibles recidivas de la epidemia de COVID, la presente guía contempla la impartición de la asignatura en formato bimodal: todas las actividades formativas planificadas inicialmente como actividades presenciales, en caso de ser necesario pasarán a desarrollarse a través de plataformas online. En caso de que esto ocurriera, se notificará en el moodle de la asignatura todas las acciones a realizar, el nuevo material (si procede), etc.