

## Course guide

### 230156 - GI - Internet Management

Last modified: 25/05/2023

**Unit in charge:** Barcelona School of Telecommunications Engineering  
**Teaching unit:** 744 - ENTEL - Department of Network Engineering.

**Degree:** BACHELOR'S DEGREE IN TELECOMMUNICATIONS TECHNOLOGIES AND SERVICES ENGINEERING (Syllabus 2015). (Optional subject).  
BACHELOR'S DEGREE IN ELECTRONIC ENGINEERING AND TELECOMMUNICATION (Syllabus 2018). (Optional subject).

**Academic year:** 2023    **ECTS Credits:** 6.0    **Languages:** English

#### LECTURER

**Coordinating lecturer:** Consultar aquí / See here:  
<https://telecos.upc.edu/ca/estudis/curs-actual/professorat-responsables-coordinadors/responsables-assignatura>

**Others:** Consultar aquí / See here:  
<https://telecos.upc.edu/ca/estudis/curs-actual/professorat-responsables-coordinadors/professorat-assignat-idioma>

#### PRIOR SKILLS

ETSETB Academic regulations.

#### TEACHING METHODOLOGY

NO classes.

- Practices remote optional.
- Group work (distance learning).
- Individual work (distance learning).
- Exercises.
- Testing short answer.
- Testing llarga response.
- Other activities.

#### LEARNING OBJECTIVES OF THE SUBJECT

Learning of the basic techniques, protocols and standards to manage and administer the Internet. Vision of the useful tools to manage the internet.

#### STUDY LOAD

Type	Hours	Percentage
Self study	98,0	65.33
Hours large group	52,0	34.67

**Total learning time:** 150 h

## CONTENTS

### Internet Management

**Description:**

Internet Monitoring Introduction  
Management Information Base  
Internet Management Protocols  
Web based services, Policy based internet management, Configuration Management

**Specific objectives:**

- To distinguish between internet monitoring and internet management
- To know different internet management databases
- To distinguish among the current internet management protocols
- To understand the new internet management systems

**Related activities:**

- Virtual laboratory practise
- Specific homeworking
- Debate forum

**Full-or-part-time:** 13h

Self study : 13h

### 2. Structure of Management Information (SMI)

**Description:**

Description, notation and definition of the management information

- Tree structure
- Object identifier, naming, registration

**Full-or-part-time:** 9h

Practical classes: 4h

Self study : 5h

### 3. MIB, Management Information Base

**Description:**

The management information is defined and implemented by means of MIBs

- MIB structure
- MIB examples
- Practical use

**Full-or-part-time:** 20h

Practical classes: 8h

Self study : 12h

#### 4. SNMP versions 1 & 2 protocols

**Description:**

Primitives definition. Architecture aspects. Performance evaluation, compatibility, tools, management procedures

- SNMP evolution
- Primitive definitions
- Architectures
- Tools and practical cases

**Full-or-part-time:** 24h

Practical classes: 8h

Self study : 16h

#### 5. SNMP version 3 protocol

**Description:**

Primitive description of the protocol. Comparative analysis with previous versions, performance, functionalities

- Primitives and administration
- Architecture
- Tools

**Full-or-part-time:** 15h

Practical classes: 4h

Self study : 11h

#### 6. RMON Remote Monitoring

**Description:**

Structure description. Architecture, functionality and procedures

- Remote monitoring architecture
- RMONv1 and RMONv2
- Practical cases

**Full-or-part-time:** 10h

Practical classes: 4h

Self study : 6h

#### 7. Monitoring applications

**Description:**

Applications architecture. Practical use of free software tools

- Functionalities and architecture of the applications
- Vendor tools
- Free software tools

**Full-or-part-time:** 17h

Practical classes: 4h

Self study : 13h

#### 8. Policy based management. COPS protocol

**Description:**

A new management paradigm to apply to multimedia services and quality of service

- Definition and architecture
- COPS protocol

**Full-or-part-time:** 14h

Practical classes: 4h

Self study : 10h

#### 9. Configuration management using NetConf and YANG

**Description:**

New configuration systems using files

- NetConf
- YANG

**Full-or-part-time:** 10h

Practical classes: 4h

Self study : 6h

#### 10. Web services based on management

**Description:**

The use of web servers requires a new system management based on web services

- Java management, JMAPI, JMX
- WBM and XML/DTD/Schema representation

**Full-or-part-time:** 18h

Practical classes: 8h

Self study : 10h

### ACTIVITIES

#### (ENG) EJERCICIOS: (AL MENOS UNO EN CADA TEMA)

**Description:**

Realization of exercises, works or practical cases based on the main concepts of each subject.

**Full-or-part-time:** 92h

Self study: 92h

#### (ENG) CONTROLES DE RESPUESTA CORTA: 10

#### (ENG) EXAMEN DE RESPUESTAS LARGAS: A MITAD DEL CURSO Y AL FINAL



## GRADING SYSTEM

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Final mark of the course will be obtained: either from the continuous assessment score (proposed by the professor throughout the course work and laboratory practice) or final exam, according to the following criteria:

Final exam: 100%

Continuous Assessment: Two partial tests: 30% + 30%

- Exercises + Practices optional: 40%

## BIBLIOGRAPHY

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### Basic:

- Barba, A. Gestión de red [on line]. Barcelona: Edicions UPC, 1999 [Consultation: 04/03/2015]. Available on: <http://hdl.handle.net/2099.3/36179>. ISBN 84-8301-212-X.

### Complementary:

- Farrel, A. [et al.]. Network management: know it all [on line]. Boston: Morgan Kaufmann, 2008 [Consultation: 01/04/2020]. Available on: <https://ebookcentral.proquest.com/lib/upcatalunya-ebooks/detail.action?docID=365625>. ISBN 9780080923420.

- Claise, B.; Clarke, J.; Lindblad, J. Network programmability with YANG: the structure of network automation with YANG, NETCONF, RESTCONF, and gNMI. Boston: Addison-Wesley, 2019. ISBN 9780135180396.

## RESOURCES

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### Other resources:

Slides, exercises, notes, videos on the Atenea website.

Transparencies and other materials from the University of Twente.