APS2 - Satellite telecommunication network

From the Advanced Master SPAPS (Space Applications and Services)

ISAE SUPAERO
Institut Supérieur de l'Aéronautique et de l'Espace

Key elements

Period: **Late October to January**

Estimated duration: **45 hours**

For whom:
recent graduates, jobseekers and experienced employees

Location:
ISAE-SUPAERO, Toulouse

Language: **English**

Highlights

- Networking for the Internet, access network architectures and application to satellite links

- High throughput GEO satellites

- End user quality of experience

This module is dedicated to the understanding of IP networks and more particularly to the techniques needed to provide a good user experience. The notions of quality of service (QoS) and the associated architectures within access networks are detailed. The security aspect is also presented. The application to High Throughput Satellites (HTS) makes it possible to understand the specific constraints of geostationary satellites and the radio resource management techniques that must be implemented.

Prerequisites

- Basic telecommunication network knowledge

Learning objectives

After completing this course, participants will be able to:

- Understand the principles of IP network architectures.

- Be able to characterize the end-to-end quality of service and identify the distribution of objectives by segments

- Be able to identify protocols and equipments needed for secured network architecture.

- Be able to describe network topology and define roles.

- Understand the impact of the satellite link on end-to-end quality of service.

- Understand satellite link major dimensioning parameters and adaptation to the radiofrequency channel.

- Be able to determine user quality of experience.

Information and registration

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Course content

APS401 - Telecommunications and networks (18 h):

The module introduces the principles of layered networks and the notions of protocols and services. These definitions are then applied to the analysis of IP networks. An emphasis is placed on the Quality of Service (QoS) mechanisms and the basic security principles (data encryption). A first lab introduces the interactions between access techniques in satellite networks and upper protocol layers.

APS402 - Broadband satellite communication systems (32 h):

Systems considered in this module rely on the use of high capacity geostationary satellites (HTS). The investigation of the architecture and the radio resource procedures allow the student to master the most relevant techniques to provide the best quality of experience for the end users. A specific emphasis is placed on the use of very high frequencies, typically above 20 GHz (Ka, Q and V bands).

Teaching methods

Teaching methods	Yes
Lectures / tutorial	X
Collaborative learning	
Flipped classroom	
Blended learning (online and face to face)	
Learning by doing	X
Project-based	
Simulation	
Case study	X

Assessment

Written exams