

MASTER ADVANCED COMMUNICATION SYSTEMS

IN BRIEF

Type of diploma : Master (LMD)

Ministry field : Sciences, Ingénierie et Technologies

Mention : RESEAUX ET TELECOMMUNICATION

ACCREDITED ESTABLISHMENTS

- * UNIVERSITE TOULOUSE 3
- * ISAE TOULOUSE
- * INSA TOULOUSE
- * ECOLE NATIONALE DE L'AVIATION CIVILE

MORE INFO

ECTS credits : 120

Level : BAC +5

Type of education

- * Formation continue
- * Formation initiale

Kind of education : Parcours

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<http://www.enseeiht.fr/fr/index.html>



Presentation

Objectives

Skills

Training content

Plein temps pour les semestres 7, 8 et 9, le semestre 10 est un stage.

Organization

- Année-M2-Advanced Communication Systems (ACS)

- Semestre 10-M2-ACS

Choice: 1 Among 1 :

- Teaching Unit PFE sans PL (ACS)

- PFE + PL (ACS)

- Teaching Unit PFE standard (ACS)

- Teaching Unit Projet Long (ACS)

- Semestre 9-M2-ACS

- Teaching Unit SHS SN Semestre 9

Person(s) in charge
HULL ALEXANDRA

- Subject Professional English-LV1-Semestre 9

- Subject Anglais Scientifique

- Choix 2 Anglais Professionnel - 3A

Choice: 1 Among 1 :

- Subject Anglais Clinique

- Subject Anglais de Cambridge ou Projet

- Subject Bureau d'Etudes Industrielles (BEI/BEE)/Conférence

- CHOIX 1 sur 2 SHS SN S9

Choice: 1 Among 1 :

- Careers, Leadership et Management

Person(s) in charge
HULL ALEXANDRA

- Subject IT and Computer Law (SN)

- Subject Strategic and Critical Thinking (SN)

- Subject Innovation-Entreprenariat - S9

Person(s) in charge
HULL ALEXANDRA

- Teaching Unit UE A CHOIX SELON FINALITE

Choice: 1 Among 2 :

- Subject Complex Graph Networks

Person(s) in charge
GERGAUD JOSEPH

- Subject Cybersecurity : introduction and practice

Person(s) in charge
MORGAN BENOIT

- Subject Infrastructure for cloud, big data and machine learning

Person(s) in charge
HAGIMONT DANIEL

- Subject Infrastructure for BigData

Person(s) in charge
ROUX HELENE

- Subject Compression et Multimédia

Person(s) in charge
CHARVILLAT VINCENT
POULLIAT CHARLY

- Subject Projet USRP par SILICOM

Person(s) in charge
COULON MARTIAL

- Subject Data analysis 2 and classification

Person(s) in charge
MOUYSSET SANDRINE

- Subject Introduction à la Mécanique quantique pour le calcul

Person(s) in charge
ROUX HELENE

- Choix UE-M2-ACS

Choice: 1 Among 1 :

- Teaching Unit UE1-PHY

Person(s) in charge
POULLIAT CHARLY

- Subject PHY 1 : Coding & Security

Person(s) in charge
POULLIAT CHARLY

- Subject PHY 2 : Advanced waveform design

- Teaching Unit UE2-NET

Person(s) in charge
CHAPUT EMMANUEL

- Subject NET1 : Delay Tolerant Networks, a discrete event simulation

Person(s) in charge
RADZIK JOSÉ

- Subject NET2: The Edge of Things

Person(s) in charge
CHAPUT EMMANUEL

- Teaching Unit PROJET DE RECHERCHE

- Choix Parcours Master ACS

Choice: 1 Among 1 :

- Semestre 9 SN Parcours Infrastructure Big-Data et IoT

Objectives

Design and implementation of the communication, storage, and computing infrastructure for the Internet of Things and Big Data.

Targeted skills

Modeling, designing, and deploying a communication infrastructure capable of scaling up to several billion nodes to meet the requirements of the Internet of Things and the Big Data.

Designing and implementing network-system architectures (enterprise networks, operator networks, data-centers, ...) to enable robust and sustainable operations.

Designing system and network infrastructures capable of meeting the requirements of the application domain (AI, IoT, ...) in terms of performance and scalability.

Person(s) in charge

JAKLLARI GENTIAN

- Teaching Unit SOFT AND HUMAN SKILLS

Person(s) in charge

HULL ALEXANDRA

- Subject Professional English-LV1-Semestre 9

- Subject Anglais Scientifique

- Choix 2 Anglais Professionnel - 3A

Choice: 1 Among 1 :

- Subject Anglais Clinique

- Subject Anglais de Cambridge ou Projet

- Subject Careers, Leadership & Management-S9

Choice: 2 Among 3 :

- Subject Conduite d'opération en hydraulique (MF2E)

Objectives

Give future engineers the notions and tools to be operational in project management, here applied to hydraulic engineering.

Description

- Project manager & company manager".

Role of each stakeholder. Regulatory files: authorization file, nomenclature of the law on water, relationship with the services of the Administration (DREAL, DDT, AFB ...). Schedule of operation.

- "The standardized missions of the project manager".

APS, AVP, PRO, DCE, VISA, DET, OPR.

- "Business Consultation "

Constitution of technical documents for consultation (CCTP, BP, DQE). Presentation of the repositories (Eurocodes, fascicles, standards, GTR).

Person(s) in charge
LAUVERGNIER FRANCOIS

· **Subject Controverses dans un monde en transition (MF2E)**

· **Subject RSE (MF2E)**

· **Subject IT and Computer Law (SN)**

· **Subject Strategic and Critical Thinking (SN)**

· **Subject Bureau d'Etudes Industrielles (BEI/BEE)/Conférence**

· **Teaching Unit RESEAUX POUR IOT**

Objectives

Understanding the challenges involved in connecting objects (the things in the Internet of Things) to the Internet.

Understanding the main IoT access network architectures, including Low Power Wide Area Networks (LPWAN), cellular networks, and Wireless Personal Area Networks (WPAN).

Provide a critical analysis of the standardized solutions for each of the main IoT access network architectures.

Targeted skills

Be capable of designing, evaluating, and implementing an IoT access network that takes into account the requirements of a specific IoT use case or application.

Person(s) in charge
JAKLLARI GENTIAN

· **Subject Introduction de IoT et SG**

Person(s) in charge
JAKLLARI GENTIAN

- Subject IoT Cellular architectures

Person(s) in charge
BEYLOT ANDRE LUC

- Subject WPAN/LPWAN IoT Archi.

Person(s) in charge
JAKLLARI GENTIAN

- Subject IoT Interconnection

Person(s) in charge
CHAPUT EMMANUEL

- Teaching Unit INFRASTRUCTURE BIG DATA/IA

Person(s) in charge
HAGIMONT DANIEL

- Subject Infrastructure Cloud

Person(s) in charge
HAGIMONT DANIEL

- Subject Infrastructure Big data

Person(s) in charge
HAGIMONT DANIEL

- Subject Projet Infrastructure

- Teaching Unit RESEAUX D'OPERATEURS

Person(s) in charge
CHAPUT EMMANUEL

- Subject Réseaux d'accès

Person(s) in charge
DHAOU RIADH

- Subject Réseaux de coeurs

Person(s) in charge
BEYLOT ANDRE LUC

- Subject Réseaux métropolitains

Person(s) in charge
CHAPUT EMMANUEL

- Subject Interconnexion

Person(s) in charge
CHAPUT EMMANUEL

- Subject Métrologie

Person(s) in charge
JAKLLARI GENTIAN

- Teaching Unit SERVICES D'INFRASTRUCTURE

Person(s) in charge
PAILLASSA BEATRICE

- Subject Cloud networking

Description

Chap1 Context-

Data center History : data and storage networks-from centralised to cloud networking Virtualisation principle of containers versus virtual machine-levels of virtual communications-specificities of L 2 virtual communications MAC addressing and extended VLAN segmentation L3 virtual communications addressing, IP floating .

Chap2 Data Center Architecture

DC Network. Network Element Architecture- Isolated processes: Routing and Switching- Integrated processes: Flow switching- Separated processes Hardware design-Multistage Fabric Software design-SDN concept

Performance of Communication Architecture-Limitations- Congestion management principles- Traffic management principles

Chap3 Data center Communication

Topology types big switch, clos network fat tree-main communication protocols- Routing and Topology-Problems and New solutions for DC-Hierarchical L2Routing with Pod and pseudo addresses- L3 routing on pseudo IP addresses

Infrastructure Standardisation TIA942 standard elements-Redundancy and reliability levels-Rated (tiers) DC --Data Center Bridging standards- Enhanced Ethernet flow control and congestion management. PFC,ETS,CN,DCBX

Chap4 Load sharing

Principles of load sharing: Load sharing objective, levels and processes: discovery, distribution, type of distribution: traffic independent, traffic dependant, load dependant

Path Load sharing: Bridging sharing, STP, Trill SPB Packet; Routing sharing- ECMP, Flow routing sharing : MPLS-TE, Segment routing

Chap5 Reliability

Introduction : Failure characteristics, Fault handling strategies, protection and restoration

Failure recovery for routed network: Recovery methods in MPLS-TE, recovery cycles : rerouting and protection switching, local versus global strategies, bandwidth sharing versus protection ; Fast reroute Mechanism – overview , types of protection; detour and bypass illustration, Signalling

Failure recovery for bridged networks: EPRS

Number of hours

10 seances

Person(s) in charge

PAILLASSA BEATRICE

Teaching language

Supports en anglais

- Subject SDN et Virtualisation

Person(s) in charge

PAILLASSA BEATRICE

- Subject Distibution des contenus

Person(s) in charge

FASSON JULIEN

- Teaching Unit UE A CHOIX SELON FINALITE

Choice: 1 Among 2 :

- Subject Complex Graph Networks

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GERGAUD JOSEPH

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MOUYSET SANDRINE

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ROUX HELENE

- Semestre 9 SN Parcours Télécoms sans fil et objets connectés

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- Teaching Unit TECOMMUNICATIONS AVANCEES

Person(s) in charge
POULLIAT CHARLY

- Subject Communications multi-antennes et multi-utilisateurs

Person(s) in charge
COULON MARTIAL

- Subject Bancs de filtres et OFDM Avancés

Person(s) in charge
BOUCHERET MARIE LAURE

- Subject Codage moderne et détection avancée

Person(s) in charge
POULLIAT CHARLY

- Teaching Unit TERRESTRIAL COMMUNICATION SYSTEMS AND IOT

Person(s) in charge
DHAOU RIADH

- Subject Sécurité pour les systèmes mobiles

Person(s) in charge
KRAEMER ISABELLE

- Subject Techniques d'accès et comm. coopératives

Person(s) in charge
BOUCHERET MARIE LAURE

- Subject Couches PHY 4G-5G

Person(s) in charge
ESCRIG BENOIT

- Subject Réseaux pour IoT

Person(s) in charge
DHAOU RIADH

- Teaching Unit COMMUNICATIONS SPACIALES ET AERONAUTIQUES

Person(s) in charge

· **Subject Systèmes Satellites**

· **Subject Multimédia et mobile par satellites**

· **Subject Réseaux Satellites**

Person(s) in charge
FASSON JULIEN

· **Subject Navigation et Localisation par Satellite**

· **Teaching Unit RESEAUX MOBILES**

Person(s) in charge
PAILLASSA BEATRICE

· **Subject Mobilité réseaux**

Person(s) in charge
PAILLASSA BEATRICE

· **Subject Mobilité d'accès**

Person(s) in charge
DHAOU RIADH

· **Subject Architecture télécom mobiles**

Person(s) in charge
DHAOU RIADH

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Access conditions

Accès en 2ème année de Master : sauf cas de validation, l'accès en 2ème année de Master est subordonné à l'obtention des 60 premiers crédits du programme de Master dans un domaine compatible avec la formation. L'admission s'effectue sur dossier, en fonction des capacités d'accueil et sur critères exclusivement pédagogiques.

Further study

Doctorat

Professional insertion

Organizational unit

École Nationale Supérieure d'Électrotechnique d'Électronique d'Informatique d'Hydraulique et des Télécommunications

Places

Toulouse

Administrative contact(s)

n7@enseiht.fr