MASTER COMPUTER SCIENCE
SYSTEMS AND SERVICES FOR THE
INTERNET OF THINGS

ENTRY REQUIREMENTS
Acceptance on the course is by application. Admission to M1 is possible with a General Bachelor's degree. Entry in M2 is possible after a high school diploma + 4 years of higher education or the equivalent.

ACQUIRED SKILLS
The course teaches skills in the design, implementation and evaluation of solutions for the Internet of Things (connected objects). It covers aspects connected with the communications protocols, administration, network supervision, security, service quality and the programming of these objects. It has a wide field of application, such as the supervision of intelligent buildings, assistance for dependent people, etc.

YOUR FUTURE CAREER
There are job opportunities in both the professional world and the academic world. The business sectors accessible to graduates are operators and suppliers of IT services based on connected object technology for individual and business consumers. The types of jobs available are connected with research and development in the field of networks and the Internet of Things, such as R&D engineer, network architect, Internet of Things consultant, object network and systems administrator, project manager, operations manager, integrator, etc. As regards the academic world, graduates can continue their studies with a PhD.

BENEFITS OF THE PROGRAM
This course targets a new area of the Internet of Things and stands out through the quality of the supervision primarily delivered by the LRT (Software, Networks and Real-Time) research team at the Gaspard Monge computing laboratory (UMR8049 LIGM). The teaching team is composed of teacher-researchers who work and actively participate in collaborative projects with industrialists in this area.

FIELD
Science, technology, health

Course suitable for:
- Continuing education
- Recognition of prior learning
- Apprenticeship
- Initial education

How to apply:
Apply using the "Applications" application. It is important to include a certificate of the required degree, a transcript of grades, a personal statement and possibly a reference in your application.

Course venue:
Descartes Campus, Champs-sur-Marne, Marne-la-Vallée (Copernic Building).

Contacts:
Coordinator of the degree program : LAPORTE Eric
Academic coordinator : RACHEDI Abderrezak
Academic secretary (second-year) : LE GOUILL Isabelle
Building : Copernic
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Calendar:
Internships in M1 (6 ECTS, 3 months min.) and in M2 (15 ECTS, 4 months min.). Work and study training : 2 days a week in a company.

Pour candidater : HTTPS://CANDIDATURES.U-PEM.FR/
For further details :
Information, Career guidance and Professional integration Department
(SIO-IP) : sio@u-pem.fr / +33 1 60 95 76 76

www.u-pem.fr/formations/793
STUDY PROGRAM

YEAR 1, SEMESTER 1.

Compulsory units: (ECTS : 27)
- Advanced Java unit (ECTS : 6)
- Methods and modelling for optimisation unit (ECTS : 3)
- Problem complexity unit (ECTS : 3)
- Advanced databases unit (ECTS : 3)
- English (ECTS : 3)
- Python and scripting languages unit (ECTS : 3)
- Design pattern unit (ECTS : 3)
- Image processing unit (ECTS : 3)
- Communication unit (UPEM) (ECTS : 3)
- Web 2.0 unit (UPEM) (ECTS : 3)
- Combinatorics unit (UPEM) (ECTS : 3)
- Design pattern unit (UPEC) (ECTS : 3)
- Operational security (UPEC) (ECTS : 3)

Optional units choice of 1 out of 2 (UPEC) or 3 (UPEM) on offer: (ECTS : 3)
- Specific UPEM unit (ECTS : 9)
  - Real-time programming (ECTS : 3)
  - Language resources (ECTS : 3)
  - Image synthesis (ECTS : 3)
- Specific UPEC unit (ECTS : 6)
  - IT and society (ECTS : 3)
  - Introduction to security (ECTS : 3)
- Data compression unit (ECTS : 3)
- Business knowledge unit (UPEM) (ECTS : 3)
- Scripting languages for business (UPEM) (ECTS : 3)
- Applied security (UPEC) (ECTS : 3)
- Logic and programming (UPEC) (ECTS : 3)
- Verification methods and tools (UPEC) (ECTS : 3)

Internship (ECTS : 6)

YEAR 1, SEMESTER 2.

Compulsory units: (ECTS : 12)
- Network programming unit (ECTS : 6)
- Cryptography unit (ECTS : 3)
- Network architecture and operations unit (ECTS : 3)

Optional units:
- Specific UPEM unit (ECTS : 9)
  - Real-time programming (ECTS : 3)
  - Language resources (ECTS : 3)
  - Image synthesis (ECTS : 3)
- Specific UPEC unit (ECTS : 6)
  - IT and society (ECTS : 3)
  - Introduction to security (ECTS : 3)
- Data compression unit (ECTS : 3)
- Business knowledge unit (UPEM) (ECTS : 3)
- Scripting languages for business (UPEM) (ECTS : 3)
- Applied security (UPEC) (ECTS : 3)
- Logic and programming (UPEC) (ECTS : 3)
- Verification methods and tools (UPEC) (ECTS : 3)

Internship (ECTS : 6)

YEAR 2, SEMESTER 3.

Services unit (ECTS : 9)
- Service-oriented programming (ECTS : 3)
- OS and object-oriented programming (ECTS : 2)
- Mobile terminal programming (Android, etc.) (ECTS : 2)
- Data collection and fusion (ECTS : 2)

Networks unit (ECTS : 9)
- Networks without infrastructure (ECTS : 2)
- Routing and data transport in networks without infrastructure (ECTS : 2)
- Wireless networks for communications systems (ECTS : 3)
- Modelling networks and performance evaluation (ECTS : 2)

Systems unit (ECTS : 11)
- Sensors and measurement chains (ECTS : 2)
- Physical architecture of objects (ECTS : 2)
- Low-level object-oriented programming (microcontroller) (ECTS : 3)
- Cognitive networks (SDR, GnuRadio, ...) (ECTS : 2)
- Cellular networks for M2M (LTE-A) (ECTS : 2)

YEAR 2, SEMESTER 4.

Services unit (ECTS : 4)
- Object Web and services (ECTS : 2)
- Service quality for connected objects (ECTS : 2)