Smart Urban Technologies

1st Edition
Code: 173006
Category: Specialist Diploma (postgraduate)
Credits: 33.00
Language: English
Start date: 18/10/2017
Last session face-to-face session: 24/11/2017
End date: 07/09/2018

Day and Time: Wednesday and Thursday from 18:00 to 21:00, Friday from 17:00 to 21:00 and Saturday from 9:00 to 14:00
Location: Polytechnic School of the University of Girona and Science and Technology Park of the University of Girona
Places available: 60

Prices and discounts

Price: 4.390 €

Informative Sessions

	Date	Time	Place
Informative session 1	21/09/2017	18:00	Science and Technology Park University of Girona (Building Giroemprèn, Classroom 4-5)

See the Master's website (click here)

Presentation

This diploma has been designed as a module contained within the master's degree in Smart Cities. The course runs concurrently with the master's degree, sharing the same schedule and calendar but with fewer credits.

Aims

To train professionals to lead cross-disciplinary teams for Smart City projects anywhere in the world.
To offer university graduates specific training in information technologies, city planning and socioeconomics in order to deal with present-day challenges in modern cities.
Specialist Diploma in Smart Urban Technologies it's part of the Master's degree in Smart Cities. During the master's degree the students complete an on-site practicum in different cities around the world where they develop real smart city projects working alongside city public authorities. Students who complete the programme will be qualified to work in the new and promising profession of smart urban technologist, an advantageous position from which to enter the incipient market for smart city solutions and consulting, as well as to deepen their knowledge in research careers.

Professional outings

Due to the length and credit value of the two diplomas, they are geared more towards working professionals who wish to complete the master's degree in the near future but on a progressive basis (diploma modules count towards the full master's degree; courses completed as part of either of the two diplomas will automatically be validated on enrolling on the full master's degree in the future):

The master's degree and diplomas offer good professional opportunities for:
– Professional consultancy and entrepreneurship.
– Public administration.
– Technology and research centres.
– R&D departments in small and medium-sized enterprises, as well as in large companies.
– Technology-based departments in engineering firms and companies dedicated to innovation and the implementation of technological solutions.

Who the course is for

Anyone interested in Smart Cities. We understand that the Smart City concept is broad, ranging from more tech-oriented profiles to more social or economic ones.

Admission requirements

There is no specific requirement for candidates.

Syllabus

Urban planning and ICTs: concepts and initiatives

Review of various urban initiatives leading up to the Smart City: new urbanism ("smart code"), ruralism, fractal city, sustainable city, liveable city, knowledge city, creative city, digital city, smart city. Smart City experiences in the new city and existing city. Planned city case study. Transformed city case study. A look at different methodologies for urban planning (systematisation, standardisation, etc.). Differences between urbanism and urban planning. Study of the following concepts: planning 2.0, e-planning, web-based planning, etc.

Measuring urban smartness and sustainability

Smart cities build on the sustainable city: existing indicators for measuring urban sustainability and necessary indicators for measuring urban smartness. New representation metrics for measuring urban smartness: Neogeography, Applied Geography, Geostatistics and spatial simulation, Spatial statistical models, Space temporal modelling, Collaborative mapping, Geotagging, Volunteered geographic information, Ontologies for urban planning, City Gml, Maps mash up, Tangible maps and planning. Control of urban systems: traffic, pollution, smart watering of public places (timers and programmers complemented with weather forecasting technology, humidity data, etc. to adjust irrigation, etc.). Smart environment: monitoring of air quality, water quality, noise, humidity, temperature, nocturnal light pollution.

Urban visualization techniques

Virtual reality and modelling techniques. Description of techniques: remote sensing, 3D models and urban modelling in general, dynamic modelling, etc. Geovisual analytics, geovisualisation, data analysis for visual exploration. Visualisation and modelling of tracking data. Geographical Information Systems. Representation of geolocalised data and user maps: representation of data mining, representation of ubiquitous mobility, of mobile software activity, mobility maps (traffic in real time, etc.), mapping of anonymous data (urban flows, time patterns, etc.), combining user maps with open data, deformed maps (maps in continuous deformation according to a specific criteria).

Data analysis and data mining

Data mining and automated learning techniques: Generic module on artificial intelligence. Automated learning and knowledge

discovery techniques. Fuzzy and rough sets, logic and reasoning and spatial extensions. Ontologies for spatial analysis. Spatial data mining and analysis: focus on spatial and sequential data mining, management of spatial data (spatial data warehouse and spatial OLAP - Online Analytical Process). Decision support systems (DSS) in (spatially) distributed environments.

Communication and information infrastructures

Telecommunication networks: Technologies for telecommunication infrastructures: Wireless networks (Wireless LAN -WLAN-, Wi-Fi and HiperLAN -IEEE 802.11 -, Wireless Metropolitan Area Networks (WMAN), MDS, WiMAX, and HiperMAN, etc.), wireless access to public networks, virtual and corporative networks, TCP/IP architecture, internet services, multiservice networks, routing and quality of service resource management, privacy and security. Sensor networks: ZigBee, EnOcean; Personal area networks, Bluetooth, TransferJet, Ultra-wideband (UWB from WiMedia Alliance), web-sensors, etc.

Expert seminars

Seminars led by external experts on specific themes.

City project

The city project is a supervised practicum integrated in the structure of the master's degree. It's completed in the second half of the programme. The city project consists of a training activity in which students apply the knowledge acquired in the first five unit blocks in order to find solutions to the real needs of real cities. The practical part of the city project lasts three months. Supervised by their degree tutors and tutors of their chosen cities, students work both on-site and online with their projects (two visits to the city during the three-month period: one at the kick-off and one halfway through the period). To complete the project, students must submit a project report and make an oral presentation of the results obtained.

Results workshop

In this week-long workshop the students present their city projects and master's degree final projects. The presentation of the city projects is carried out in open format and representatives of the cities, other public authorities, companies, students and lecturers are invited to attend. It is a promotional event both for our students and for our studio. The master's degree final projects are presented in the second half of the week in a private and more academic format.

Qualification

Specialist Diploma in Smart Urban Technologies of the University of Girona*

* Does not include shipping rates of qualification document.

Teaching and Assessment

Activity is structured into two main blocks of units in which the students' working procedures involve case studies and practical examples through theoretical and practical sessions, lectures, seminars and debates.

Evaluation system

– Continuous assessment through case studies in all the units.
– The city project require a written report and an oral presentation. The final grade is calculated on the basis of the assessment of the written report, the presentation and the assessment reports submitted by the city project tutors.
– Attendance at face-to-face units in Girona is compulsory. The oral presentation of the city project in September can be carried out face-to-face or online.

Financing

Bank financing

Enrolled students can pay in installments.*

The Fundació has agreements in place offering preferential terms for their students with the following entities:

– Sabadell Consumer
– CaixaBank
– Banco Santander

* Only applicable to persons resident in Spain and upon acceptance by the bank.

Teaching table

Management

Dr. Josep Lluís de la Rosa

Has been a full professor at the University of Girona (UdG) Spain since 2010 and previously at the Rensselaer Polytechnic Institute (RPI), New York, USA (2008-2010). Director of the EASY Research Centre and of the Master's Degree in Smart Cities of the UdG. He holds an MBA from the UdG and a PhD in Computer Science from the Autonomous University of Barcelona (UAB). De la Rosa is an expert in intelligent agents, social networks, virtual currencies and digital preservation and their application to the market. He has contributed more than 200 international publications and has supervised more than 20 PhD theses. He's a researcher with entrepreneurial vision who has created several spin-off companies, starting with the world's first robotic soccer team as far back as 1996. His research into complementary and virtual currencies started in 2006 and he soon became fascinated by the disruption of the Blockchain and SmartContracts technologies and their advantages. Since then, he has been working on this theme in order to design new types of money suitable for the Internet in particular, as well as in many other applications.

Coordination

Dr. Andrés El- Fakdi

Is an assistant lecturer and researcher in the Department of Electrical Engineering, Electronics and Automation of the University of Girona. He's the Laboratory director and promoter of the EASY Centre research group. He's also a member of the coordination team of the Master's Degree in Smart Cities of the University of Girona. He holds a Degree in Electrical Engineering from the University of Girona and a PhD in computer science from the same university. His research interests are focused on contributing to the development of machine learning techniques for Decision Support Systems (DSS) in order to increase productivity and effectiveness in complex scenarios. His PhD research focused on the study and development of machine learning techniques and its application to robotics. This research successfully concluded with the use of learning algorithms to overcome non- programmed changes in the environmental conditions that lead an autonomous robot to fulfil a particular task. Meanwhile, his post-doctoral research focuses on the study of Big/Open Data applications and on the design and development of similar machine learning solutions for knowledge discovery.

Teaching staff

TBA

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Dr. Sergi Nuss

PhD in Geography and Environmental Science. Sergi is a part time professor on Environmental Policies, Low-carbon and Sustainable Urban Development, and Sustainable Tourism for the Geography Department of UdG. Since 2016 he is member of the steering committee of the Official Master's Degree in Smart Cities – UdG. Out of the University, Sergi is Project Manager at Pau Costa Foundation, in a project on the introduction of grazing herds in forests as wildfires prevention strategy. He also collaborates with Arrels a Taula, a consultancy working on territory, gastronomy and peasantry projects. Last but not least, Sergi is Board Member and Activist at Associació Naturalistes de Girona, since 1994.

Dr. Joan Vicente

PhD in Geography (UAB) and Director of the Department of Geography of the Universitat de Girona. Specialized in urban and strategic planning.

*Management reserves the right to modify the teaching staff, if necessary, to ensure the levels of quality and professional category.

Promoting entities

Fundació UdG: Innovació i Formació

Universitat de Girona
Fundació UdG:
Innovació i Formació

Tecnio Centre EASY