



UNIVERSITAT POLITÈCNICA DE CATALUNYA
BARCELONATECH
School of Professional & Executive Development



Camins.cat
Col·legi d'Enginyers de Camins,
Canals i Ports de Catalunya



Escuela de Camins
Escola Tècnica Superior d'Enginyeria de Camins, Canals i Ports
UPC BARCELONATECH

Posgraduate in Water & Energy & City. *Leading the Future*



Agbar



Ajuntament de
Barcelona

gasNatural
fenosa 

INDEX

- 1. Context**
- 2. Objectives**
- 3. Proposal**
 - ☐ **Structure**
 - ☐ **Water Module**
 - ☐ **Energy Module**
 - ☐ **City Module**

Context

- Integration of three essentials in actual human life: water, energy and cities: How smart **cities** deliver urban services as **water** and **energy** in the digital era, requires an integral approach according the new era.
- No one professional specialist is actually trained for lead the actual complex holistic scenario: Facing the **update of Civil engineering education** and according to the needs of nowadays society, companies are searching for civil engineers with additional multidisciplinary skills.
- In order to prepare versatile civil engineers to **changing realities**, without change the existing official educational program (degree and master degree).
- For this purpose a **Committee** has been constituted between School of Civil Engineering and CICCIP Professional Association of Civil Engineers.

Context

- To put it bluntly:
- This is not “another” postgraduate module. It was structured and intended for professionals who, in the near future, will be requested to provide solutions. under the framework of **design thinking**, to challenges and problems that society will face, in the context of:
 - Population growth and massive concentration in urban areas
 - Water management in scarcity scenarios of climate change
 - Energy demand and its transition to more sustainable clean energy deliver

Context

- Why should I have to take this courses?
- → Added Value:
 - Taught by experts of the different entities supporting this module
 - Chance to deal with more real than academic engineering problems
 - The **possibility** to carry out practices at the entities (depending on the student performance/company needs)
 - The final project could be the starting point of the TFM
 - Recognition of 15 out of 30 ECTS of the compulsory practices
 - Module mostly funded by the entities, so the registration fee is quite affordable



Objectives

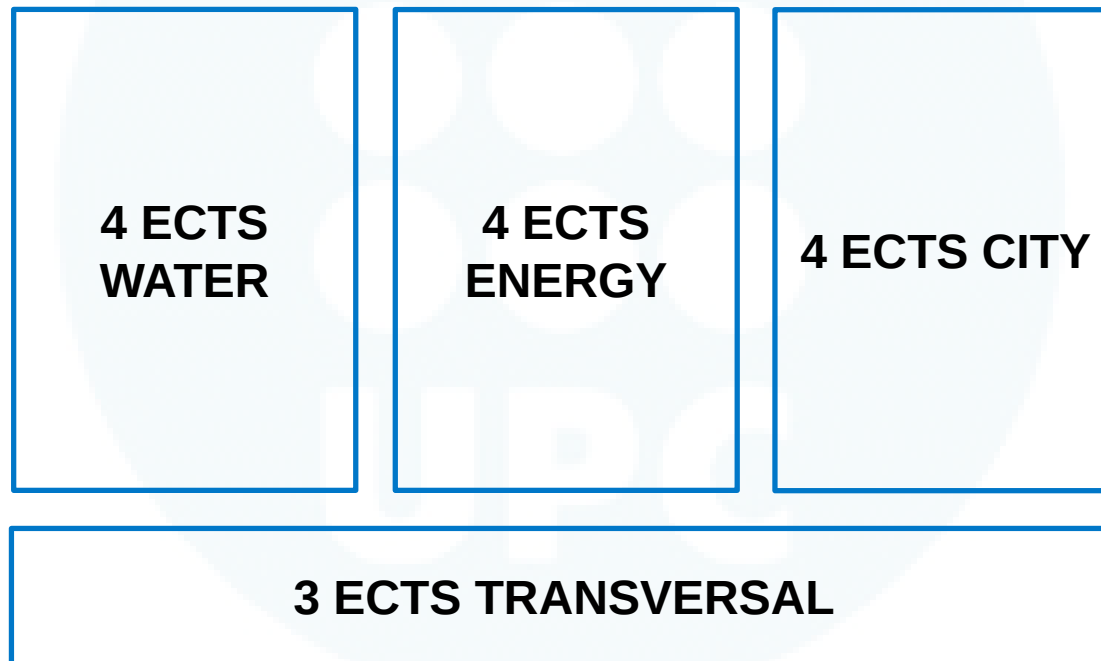
- Promote basic principles for sustainable coexistence with a rational use of ***advanced and efficient urban services***.
- The program will focus on ***urban system's complexity*** across the globe and its own metabolism: cities as privileged places in exchange for sharing.
- The program will examine the fundamental issues necessary to ***deliver city's water & energy needs*** along the maintenance or transforming processes during non stop city life.
- Learners will be provided with the ability to avoid and manage critical situations and implement new technical projects in ***changing scenarios, within a multidisciplinary approach***.

Proposal

- Develop a **postgraduate degree** in Water, Energy and City.
- Optional postgraduate program of **15 ECTS**.
- **Complementary** program to the official Degree and Master of the School of Civil Engineers.
- Program promoted by **companies** through:
 - Committee (scholarship program, candidate selection).
 - Given lessons by business professionals, public technical officials and academic professors.

Proposal

Postgraduate proposed structure:



Water Module > New Water Scenario

- Why?
 - New trends and key challenges in water sector.
 - Complement the hydraulic engineering and treatment processes developed in the Master, with a management vision on technical, economical, social and sustainable water exploitation and distribution.
 - 4 ECTS (100 h)
 - Contents:
 - Advanced Operations in water services
 - Water Services Management
 - Water, Energy & City: From a Water View
 - Customer value management and Commercial processes (*online)

* online ECTS could be directly transferable for those student who wish to pursue the Master in Technology and Water Management – online (60 ECTS).

Water Module > New Water Scenario

Title	Content	ECTS
Bloque 1: Water, Energy & City desde la Perspectiva del Agua	Presentación del módulo Water y visión general del bloque 1	1.2
	1.1. Configuración del servicio de abastecimiento y saneamiento de agua. Modelos de entrega	
	1.2. Precio del agua e sistema innovativo de tarifa. Recuperación de costes a través de la precio del agua. (Caso 10: Modelo de tarifa de Barcelona)	
	1.3. Visita 5: Visita guiada al Centro de Control Operativo y al Laboratorio de calidad de agua	
Bloque 2: Operaciones Avanzadas en el Ciclo Urbano del Agua	Presentación general del bloque 2	1.5
	2.1. Operación integral, eficiencia operacional, industria 4.0 en las operaciones del agua	
	2.2. Resiliencia y gestión del agua en situaciones extraordinarias. Escasez de recursos y gestión de sequías (Caso 11: estudio de caso Barcelona)	
	2.3. Watergy. Recursos energéticos en el ciclo del agua. Gestión energética eficiente en el ciclo del agua (Caso 12: biofactoria)	
	2.4. Visita 6: visita guiada EDAR Baix Llobregat: a referenced covered and urban integrated WWTP	
Bloque 3: Creación de Valor para el Ciudadano	3.1. New engagement dynamics between administration and citizens	1.3
	3.2. Ciclo comercial y back office de un servicio urbano (Caso 13: gestión del ciclo comercial de una operadora de agua)	

Energy Module > New Energy Scenario

- Why?
 - New trends and key challenges in energy sector.
 - Complement the energy engineering and treatment processes developed in the Master, with a management vision on technical, economical and social energy exploitation.
 - 4 ECTS (100 h)
 - Contents:
 - Advanced Operations in energy services
 - Energy Services Management
 - Water, Energy & City: From a Energy View
 - Customer value management and Commercial processes

Energy Module > New Energy Scenario

Title	Content	ECTS
Bloque 1: Water, Energy & City: Perspectiva Actual	Introducción. Conceptos Básicos.	1.5
	1.1. Transición energética	
	1.2. Eficiencia Energética	
Bloque 2: Perspectiva futura: evolución y gestión avanzada de la demanda energética	2.1. Transformación digital en la energía	1.5
	2.2. IoT y el Sector Energético	
	2.3. Generación distribuida	
Bloque 3: Perspectivas de futuro: Sostenibilidad, Medio Ambiente y Perspectivas Ciudadanas.	3.1 Smart Grids	1.0
	3.2 Vehículo eléctrico	

City Module > New City Scenario

- Why?
 - New trends and key challenges in urban sector.
 - Complement the urban engineering and treatment processes developed in the Master, with a management vision on technical, economical and social city exploitation.
 - Intensive use of city scenarios for learning.
 - 4 ECTS (100 h)
 - Contents:
 - City tours across the main scenarios analyzed
 - Water, Energy & City: From a City View
 - Other Significant City Services Management
 - Urban transversal management

City Module > New City Scenario

Title	Content	ECTS
Bloque 1: Water, Energy & City desde la perspectiva de la Ciudad	Presentación del módulo de City y visión general del bloque 1	1.4
	1.1. Ciclo del agua en los sistemas urbanos: historia, nuevas tendencias y proyectos (Caso 1 - Uso inteligente del agua subterráneo)	
	1.2. Sistema de distribución de energía en la ciudad: generación renovable y consumo eficiente (Caso 2: Promoción de las energías renovables.)	
	1.3. Movilidad eléctrica: Solución integrada en energía y movilidad (Caso 3 - Barcelona y la red de suministro de energía para vehículos eléctricos)	
	Visita 1: Colector subterráneo de aguas de la lluvia	
Bloque 2: Gestión de otros Sistemas de Servicios Urbanos	Presentación general del bloque 2	1.3
	2.1. ITC aplicado a los servicios urbanos: Contexto global, funciones públicas y perspectivas (Caso 4 - Creación de una plataforma abierta relacionada con la resiliencia urbana)	
	2.2. Servicios de movilidad: máxima accesibilidad sin accidentes, contaminación y atascos (Caso 5 - Transformando el escenario mediante ciclismo urbano y PEV (Plug in Electric Vehicle))	
	2.3. Limpieza urbana y recogida de basura: completando el ciclo de la materia (Caso 6 - Optimización del proceso de limpieza de la ciudad de Barcelona)	
	Visita 2: Visita guiada a la planta de incineración del Besòs	
Bloque 3: Gestión Transversal de la Ciudad	Presentación general del bloque 3	1.3
	3.1. Gestión de servicios urbanos: 25 años de trabajo colaborativo (Caso 7 - Implementación de la innovación y control de calidad en servicios urbanos)	
	3.2. Obras públicas urbanas: transformando y manteniendo la ciudad (Caso 8 - Repensando la ciudad: superillas)	
	3.3. Resiliencia urbana: concepto, evolución y mejora (Caso 9: City Resilient Profiling Program CRPP)	
	3.4. Visita 3: Proyectos de transformación de Barcelona: Glories	

Transversal Module > Implementing Management

- Why?
 - Development of transversal skills.
 - Practical business management concepts.
 - 3 ECTS (75 h)
 - Contents:
 - Innovation, entrepreneurship and digital transformation.
 - Managing and developing teams.
 - Corporate social responsibility and Ethical behavior in business.
 - Health and safety in Business environment.

Transversal Module > Implementing Management

Title	Content	ECTS
Gestión, Design Thinking, Innovación y Proyecto Final	4.1. Nociones básicas sobre gestión de equipos, gestión de conflictos, implementación de la innovación y liderazgo.	0.5
	4.2. Proyecto final	2.5

Transversal Module > Implementing Management

• Final Postgraduate Project



- Development of a multidisciplinary project in groups of 3 students.
- Ensuring that the 3 vectors are taken into account.
- Example: Urban Resilience facing emerging crisis: water (flooding, scarcity...)- Energy (power outage...) – City (transport, health...)

• Mentoring



- Mentoring by senior civil engineers.
- Learning through experience and professional guidance.

General Information

- ✓ **Degree:** Postgraduate diplomas issued by the Universitat Politècnica de Catalunya.
- ✓ **Credits:** 15 ECTS (150 teaching hours)
- ✓ **Start date:** March 2018
- ✓ **Timetable:** Tuesday to Thursday, 18:30h to 21:30h
- ✓ **Method:** Blended learning
- ✓ **Course Location:** ETSECCPB
- ✓ **More information:** Isabel de la Fuente
E-mail: isabel.delafuente@talent.upc.edu
phone: (34) 93 112 08 83

How to request information?

POSGRADO EN WATER, ENERGY & CITY

LEADING THE FUTURE

Ajuntament de Barcelona, Gas Natural Fenosa y Agbar se han unido para crear un posgrado con las tendencias más innovadoras en la **gestión integral del agua, de la energía y del entorno urbano**.

Consigue los conocimientos, herramientas y habilidades específicas para la gestión inteligente de los recursos, en contacto directo con las entidades de referencia del sector de las smart cities.

El programa está formado por **4 módulos**:

- AGUA**: Sistemas de distribución y gestión inteligente para gestión avanzada de la industria 4.0.
- ENERGÍA**: Gestión inteligente de los sistemas de distribución y aplicación de inteligencia artificial en edificios.
- CIUDAD**: Integración en el entorno urbano de los diferentes sistemas, redefinición del espacio público y de la movilidad urbana.
- CONOCIMIENTOS TRANSVERSALES**: Sesión de equipos, gestión de conflictos y desarrollo sostenible.

Los conocimientos aprendidos se aplicarán en un proyecto real desarrollado en equipo y liderado por profesionales de referencia de las entidades colaboradoras.

Información básica del posgrado:

DIRECTOR ACADÉMICO: Sergio Piñalari sergio.pinalari@upc.edu	LUGAR DE REALIZACIÓN: ETSECCP Escuela Técnica Superior de Ingeniería de Carreteras, Canales y Puertos de Barcelona
CRÉDITOS: 18 ECTS 177 horas lectivas presenciales 253 horas lectivas online y otras técnicas 63 horas proyecto final	IMPORTE DE LA MATRICULA: 400€
FECHAS DE REALIZACIÓN: Inicio clases: 05/02/2018 Fin clases: 21/05/2018	IDIOMA DE IMPARTICIÓN: Español
HORARIOS: Martes: 18:30 a 21:30 Miércoles: 18:30 a 21:30 Jueves: 18:30 a 21:30	 Inicia la preinscripción

Requisitos de acceso: Este programa va dirigido a estudiantes que actualmente estén cursando segunda o tercer curso del primer curso del master universitario de Ingeniería de Carreteras, Canales y Puertos de la UPC (la Universitat Politècnica de Catalunya).

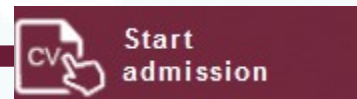
¡Inscríbete a la **Sesión Informativa** para conocer los detalles del programa y aclarar dudas!

Sesión Informativa: 17 de Mayo de 2017

Impulsado por:

Ajuntament de Barcelona, Gas Natural Fenosa, Agbar

Con la colaboración de:



<http://bit.ly/inscripcion-waterenergycity>

APPLICATION FORM

How to pre-register

PERSONAL DETAILS

Name :		Surname(s) :	
Document type :	NIF	NIF/passport/NIE :	
Country of residence :	Spain	Postal code :	
Telephone :	0034	E-mail :	

CURRÍCULUM VITAE

Curriculum vitae : No s'ha seleccionat cap fitxer.

Maximum size 10Mb

By clicking on send you accept our [data protection policy](#)

Registration Process

Welcome

We welcome you to the UPC School of Professional & Executive Development and thank you for your interest in the Postgraduate course **Water, Energy & City. Leading the Future**.

We are also pleased to inform you that the programme technician will be available to provide you all the information on the course and solve any queries you may have.

>Do you have a query?



Send us your query

>Do you wish to continue with the registration?

If you wish to continue with the **registration**, click on the next button:



Continue with the registration

We would like to remind you of programme's basic information:

Name:	Water, Energy & City. Leading the Future
Course type:	Postgraduate course (Semi-distance)
Academic Director:	Octavio César Móssó Aranda
Duration:	15 ECTS (184 teaching hours)
Course dates:	From 06-02-2018 to 05-07-2018
Timetable:	Tuesday 18:30 to 21:30h Wednesday 18:30 to 21:30h Thursday 18:30 to 21:30h
Price:	€2000
Programme Technician:	Isabel de la Fuente Larriba (Tel.:931120883)



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ADMISSION PROCESS

Water, Energy & City. Leading the Future

**1 PERSONAL
DETAILS**

**2 REQUIRED
DOCUMENTATION**

**3 ADMISSION
CONFIRMATION**

In order to start with the registration we require some personal data. If you have already provided this information but it is not correct, you can make any necessary modification or update it.



PERSONAL DETAILS

Name *:

Surname(s) *:

El nombre y los apellidos han de coincidir con los del NIF / pasaporte / NIE

Date of birth *:

Nationality *:

Gender *:

Document type *:

NIF



NIF/passport/NIE *:

Address :

Change address

Telephones *:



Add

E-mails *:



Add

* Mandatory fields

Si el pago del curso va a cargo de tu empresa, haz clic a:

☐ Quiero factura para la empresa



Accept and Continue

Send us your query

You can also get in touch at any time:
Isabel de la Fuente Larriba
931120883



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To continue with the registration process you are required to attach the requested documents. If you have already attached the documents, please make sure they are updated and that they meet the requirements for the course you wish to register for.

Once you have attached the documents click on "Accept and Continue" to continue with the process.

[Send us your query](#)

You can also get in touch at any time:
Isabel de la Fuente Larriba
931120883



DOCUMENTATION

CURRICULUM VITAE * ?

Max: 10 MB. Tipus: doc, docx, pdf



[View document](#)



* Mandatory fields



Accept and Continue



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ADMISSION PROCESS

Water, Energy & City. Leading the Future

1 PERSONAL DETAILS

2 REQUIRED DOCUMENTATION

3 ADMISSION CONFIRMATION

To complete the registration process for the programme and so we can assess your candidacy you are required to make a payment of **€110** for the course registration fees (this fee will be deducted from the full course fee). Once you have made this payment you will receive an email confirming the payment has been processed. After that we will study your application and, if you are admitted onto the course, we will send you the letter of admission. You will find all the information required for enrolment in this letter.

Please accept the economic and academic policy of the UPC School to continue with the process and then click "Pay the registration fee".

[Send us your query](#)

You can also get in touch at any time:
Isabel de la Fuente Larriba
931120883



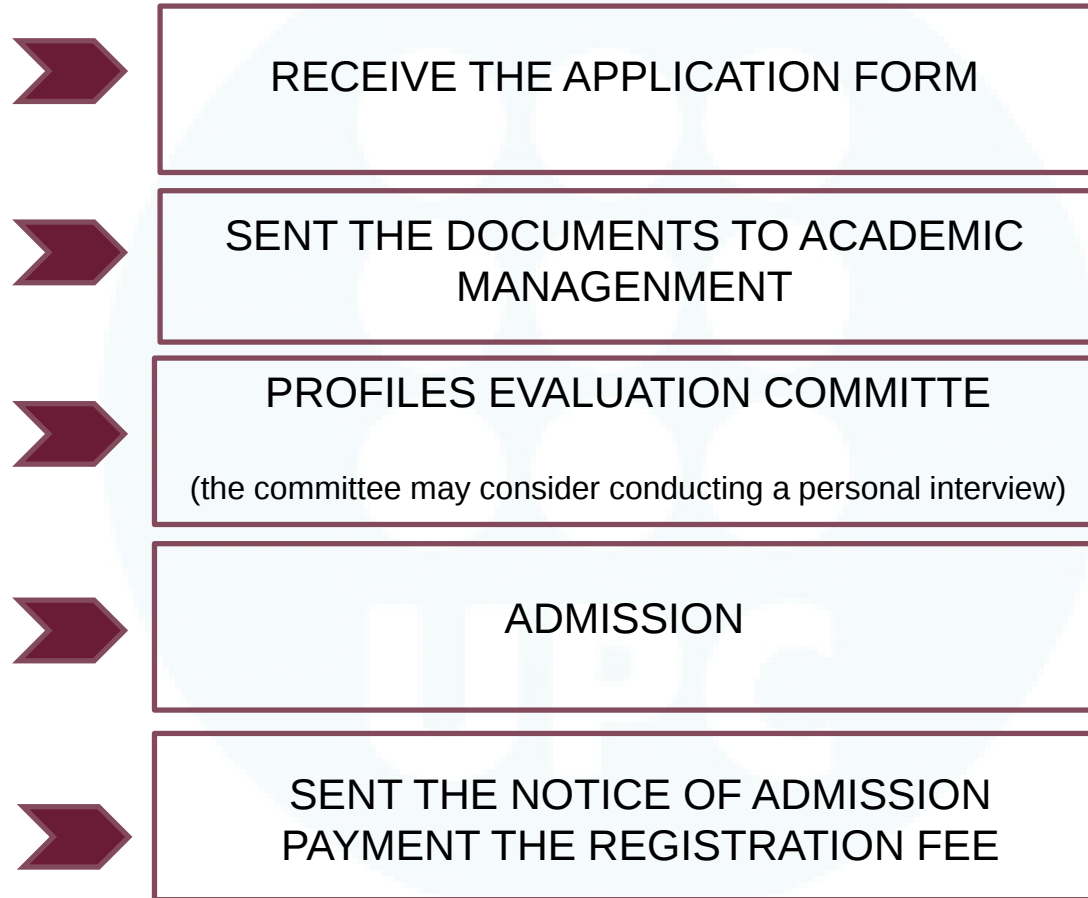
ONLINE REGISTRATION FEES PAYMENT

☐ I have read and accepted [academic and financial regulations](#) and the [data protection policy](#) of the School of Professional & Executive Development



Pay the registration fee

Application Process





THANK YOU

www.talent.upc.edu

