Thermal Energy Engineering Master

2024-2025

www.upc.edu/masters-sessions

Now, UPC masters degrees!

Register to the information sessions
## UPC / ETSEIB

**Universitat Politècnica de Catalunya**

<table>
<thead>
<tr>
<th><strong>Estudíants</strong></th>
<th><strong>PDI</strong></th>
<th><strong>PAS</strong></th>
<th><strong>Graus</strong></th>
<th><strong>Màsters</strong></th>
<th><strong>Programes de doctorat</strong></th>
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<tbody>
<tr>
<td>29,812</td>
<td>3,523</td>
<td>2,074</td>
<td>65</td>
<td>84</td>
<td>45</td>
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<th><strong>Centres docents</strong></th>
<th><strong>Programes de formació permanent</strong></th>
<th><strong>Patents el darrer any</strong></th>
<th><strong>Pressupost 2023</strong></th>
<th><strong>Ingressos per R+D+I (2021)</strong></th>
<th><strong>Alumni</strong></th>
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<td>18</td>
<td>275</td>
<td>19</td>
<td>348 M</td>
<td>72,7 M</td>
<td>70,151</td>
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</tbody>
</table>

- **16 Departments**
- **2 Institutes**
- **2 Bachelor degrees (GETI, GETIAE)**
- **15 Master’s programs**
- **3379 Students**
- **446 Teaching and Research Staff (PDI)**
- **126 Administrative and Support Staff (PAS)**
ETSEIB: Escola Tècnica Superior d’Enginyeria Industrial de Barcelona

Over 170 years of educating professionals with a very strong scientific and technical foundation

https://etseib.upc.edu/
Thermal Energy Engineering Master

First semester
Lectures in the afternoons

Second semester
Master Thesis

Barcelona School of Industrial Engineering (ETSEIB)

60 ECTS

100% English

Compulsory credits _______________ 20
Optional credits _________________ 10
Credits - Master's thesis w/o internship _____ 30
The aim is to produce scientific and technical experts with the knowledge and skills needed to analyse any engineering problem in the fields of thermal energy and fluid dynamics.
Thermal Energy Engineering Master

Mandatory courses
- Thermal Equipments for Heat and Cold Generation
- Computational Methods in Thermal Engineering
- Energy Resources
- Intensification on Heat and Mass Transfer

Elective courses
- Turbulence
- Heat Exchangers
- Experimental Measurement Techniques
- Heat Engines
Thermal Energy Engineering Master

• Generation, transport, storage and use of energy.

• Domestic, comercial, industry and transport sectors.
Thermal Energy Engineering Master

• Thermal Equipments for Heat and Cold Generation

- HEAT PUMPS
- STIRLING ENGINE
- EVAPORATIVE COOLING
- EJECTORS
- HEAT EXCHANGERS
- ABSORPTION MACHINES
- COMPRESSORS
- HVAC&R SYSTEMS
- INDIRECT SYSTEMS

- Refrigeration Cycles
- Natural refrigerants
- Digital Twins
- Transcritical CO₂ cycles
- Thermal Power Plants
- Physics rationale behind system designs
Thermal Energy Engineering Master

• Thermal Equipments for Heat and Cold Generation

Thermal management of an aircraft
Thermal Energy Engineering Master

• Computational Fluid Dynamics and Heat Transfer

  Fluid Particle
  Parallel Computing
  Combustion Kinetic mechanism
  Two Phase Flow
  Natural Convection
  TURBULENCE
  Euler Euler
  Conjugate Heat Transfer
  Navier Stokes Equations
  Solid Fluid Interaction
  Large Eddy Simulation
  Magneto Hydrodynamics

RANS modelling
Euler Lagrange
Navier Stokes Equations
Computational Fluid Dynamics and Heat Transfer
Thermal Energy Engineering Master

• Computational Fluid Dynamics and Heat Transfer

Direct Numerical Simulation DNS of Differential Heated Cavity
Thermal Energy Engineering Master

• Computational Fluid Dynamics and Heat Transfer

Thermal and Fluid Dynamic Simulation on Energy generation
Thermal Energy Engineering Master

• Computational Fluid Dynamics and Heat Transfer

Jets  Air Conditioning  Inhale medicines
Thermal Energy Engineering Master

• Experimental Measurement Techniques

Heat Pumps  Heat Exchangers  Solar Collectors  Storage Tanks

Laboratory Facilities
• Current Research Projects (top 10)

1. Thermal management of automotive electric axial motors
2. New concepts of Hydrogen storage tanks for zero-emission aircraft
3. Pollutant and Greenhouse emissions monitoring
4. Design and development of an electric vehicle public charger
5. Thermocline concepts for thermal energy storage in Concentrated Solar Power
6. Ejectors modelling oriented to thermal systems dynamic operation
7. Numerical modelling and experimental validation of H2 fuel implementation in sanitary kilns
8. Development of transport refrigerated units with low GWP refrigerants
9. Development of Digital Twins for aircraft ECS architectures
10. Advanced numerical algorithms for 3D-printing heat exchangers design
How to apply

(https://etseib.upc.edu/en/Academic%20programmes/academic-procedures/acces/application--msc-programmes)

- **Application**
  Deadline: 13th of May 2024
- **Acceptance (Academic Comission)**
  June 2024
- **Provisional listing of accepted students**
  Before the end of June 2024
- **Students' acceptance**
  Up to 7 days from the publication of the listing
- **Definitive listing of accepted students**
  Mid-July 2024
- **Enrolment**
  Check information at website etseib.upc.edu
How to apply

(https://etseib.upc.edu/en/Academic%20programmes/academic-procedures/acces/application-msc-programmes)

How to apply:

Apply UPC Admissions: [Application]

To validate the request, it is necessary to complete the information for every field:

- **Personal data**
- **Academic details**
- **Required documentation** [Required documents]
  - **Application** (*) (choose 3 specialty options for the master required)
  - **Data protection**
  - **Pre-enrolment fees** (General information about UPC* on this page)
Admission and enrollment process

Pre-enrollment in the application:
1. Processing
2. Payment to be confirmed
3. Send

PAYMENT of 300€
(ADVANCED PAYMENT OF ENROLMENT FEES)

Welcome session

Acceptance of the place

Submission of original documents and delivery of copies

Enrollment on line or in person

Start of the Master’s degree

Please, check that all the required documentation has been submitted

documentation review

validation of complete applications

Admission (Publication of the provisional list of applicants admitted)

objection/appeal period

Admission (Publication of the final list of applicants admitted)
... further information

FAQ's

Check the most frequently asked questions in this document.

International Relations and Admissions Office

Face-to-face opening office hours:
from Monday to Friday 11 am to 1:30 pm
and Tuesday 3.00 pm to 17.30 pm
Information request: https://demana.upc.edu/etseib/

📞+34 93 401 59 27
Thank you for your attention

admissions.etseib@upc.edu