

Assistant Professor in Circular Economy, Eco-Design and Design Engineering

CDI de droit public

Context:

CentraleSupélec is a public scientific, cultural, and professional institution (EPSCP in French) under the authority of the French ministers for higher education and industry. Its main missions are training high-level scientific general engineers, research in engineering and systems sciences, and executive education. As part of its development, CentraleSupélec is looking for an Assistant Professor to join the Industrial Engineering & Operations (GIO) department and carry out research in the Industrial Engineering Laboratory (LGI).

The Industrial Engineering & Operations department is an academic department at CentraleSupélec whose educational scope covers the fields of Systems Design, Supply Chain, Risk and Reliability for the 3-year CentraleSupélec Engineering Program. The department also manages Complex Systems Engineering Master for Université Paris Saclay.

The Industrial Engineering Laboratory studies production, activity, or socio-technical systems along their life cycles. These activities are organized around four targeted themes: Design Engineering, Operations Management, Sustainable Economy, Safety, and Risk Analysis.

The candidate recruited will be an expert in Circular Economy from the perspective of Industrial Engineering and Design Engineering. Their expertise will cover methods and tools for eco-design, eco-innovation, industrial ecology, diagnosis and quantified environmental assessment (in particular, Material Flow Analysis (MFA) and Life Cycle Assessment (LCA)). They will be able to grasp the complexity of large-scale socio-technical systems (product-service systems, value chains, multi-actor design processes) and ideally create bridges between the Circular Economy and Design Sciences in the broadest sense, notably around approaches to modelling, simulation and optimization of environmental performance or circularity. Their expertise could cover optimization and/or AI methods for scaling up and automating diagnosis and quantified environmental assessment. Ideally, they will have international experience and be able to teach in English.

Education task:

The candidate recruited will work mainly in CentraleSupélec's Industrial Engineering and Operations (GIO) department. Depending on their expertise and in coordination with the teaching team (it may be possible to review the distribution of responsibilities and contributions across the teaching team), they will contribute to or take responsibility for some of the Circular Economy-related courses:

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- In the 2nd year of CentraleSupélec's engineering curriculum, particularly within engineering challenge terms combining presentations and workshops by socio-economic players, theoretical and methodological contributions, and industrial case studies or projects covering one or more pillars of the Circular Economy;
- In the 3rd year of CentraleSupélec's engineering curriculum, in concentrations, where more specific aspects of the Circular Economy (eco-design, industrial ecology, MFA, LCA, etc.) are covered.
- University degree *Act for Climate* of Université Paris-Saclay
- In addition, they may supervise student projects (semester-long projects) in Circular Economy in 1st, 2nd and 3rd year, either in-house (circular campus, carbon footprints, etc.) or in collaboration with external partners.

In addition to the Circular Economy courses, a profile capable of taking part in generic Design Engineering courses (*Design Science* course (30h) in 2nd year, *Design Engineering* course (30h) in 3rd year) and more specialized complex systems design courses (*Complex Systems Engineering* course (24h), design workshops (30h) in 3rd year) will be particularly appreciated.

The candidate will have to demonstrate an excellent ability to connect their teaching and projects with socio-economic players in the Circular Economy (start-ups and SMEs, large companies, associations and NGOs, institutional and local authorities). They will be able to teach in English.

Last but not least, the candidate must also be able to develop existing courses or even propose new formats (pedagogical innovation) or courses.

Research mission:

The candidate recruited will conduct their research as part of the research activities of the Design Engineering research group of the Industrial Engineering Laboratory (LGI). Their mission will be to strengthen and develop activities within the research axis *Design of sustainable systems* (one of the research group's three axes, integrating activities relating to the Circular Economy and Eco-design).

A candidate who is also able to position their research activities in relation to the axis *Design of complex systems* (another of the team's axes) will be particularly appreciated.

The candidate will be expected to develop original research activities in Circular Economy and/or Eco-design, applied to complex socio-technical systems. These activities could cover theoretical and applied aspects of quantitative assessment with a focus on integrating environmental, economic, and even social/societal performances into the systems' life cycle. Research methods may involve modelling, machine learning and AI techniques, simulation (e.g., using system dynamics-type approaches), optimization, as well as techniques for validating systems to be circularized.

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The candidate will participate in the co-supervision of several PhD theses related to these themes. They will also play an active role in the *Eco-design of complex systems* doctoral course (30 hours, 20 French and international doctoral students) endorsed by the EcoSD network.

The candidate will contribute to publications in high-quality international conferences and journals and be involved in national and international learned societies in the fields concerned. They will take the initiative to participate in the development and implementation of federative projects, whether local (e.g. Université Paris-Saclay), national (e.g. ANR), or international (e.g. European), or with industrialists/institutions, which will enable them to contribute to the development of their research activity and the laboratory more generally.

Candidate profile:

The candidate must hold a PhD in Industrial Engineering, Operational Research, Mathematical Engineering, Artificial Intelligence, with applications in the field of sustainable design engineering, circular economy, eco-design, integration of environmental/economic/social dimensions for the design and management of complex systems, or a similar field.

The candidate must be an author or co-author of publications in international journals (the publication requirement will depend on the curriculum vitae and the number of years of experience). The candidate is expected to have a taste for teaching, research, and teamwork. The candidate is likely to engage in the supervision of research work in line with the themes of the research team.

Selection procedure:

Candidates must send by email only, before May, 14 at the latest, to the following contact, drh.pole-enseignant@centralesupelec.fr, a file in pdf format including with reference:

MCF-LGI-Economie Circulaire-2413

- A cover letter;
- A detailed CV (teaching experience, research, mobility, publications, etc.);
- A research and teaching project fitting within CentraleSupélec (5 to 10 pages);
- A copy of the identity card or passport;
- A copy of the doctoral degree and any document attesting to research supervision experience;
- And any documents that attest previous experience;
- Optional letters of recommendation;
- PhD thesis defence report.

Recruitment interview:

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For the candidates selected for the audition, the audition will take place in three stages:

- A presentation of the candidate's background, teaching and research project;
- An illustration of a lesson in English on a problem whose subject is identical for all candidates will be specified on the invitation;
- An exchange with the members of the committee.

The duration of the three presentations will be specified in the audition invitations.

Scientific contacts:

Bernard Yannou, director of Industrial Engineering Laboratory:
bernard.yannou@centralesupelec.fr

Anne Barros, director of Industrial Engineering & Operations department:
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François Cluzel, head of Design Engineering research group at Industrial Engineering Laboratory:
francois.cluzel@centralesupelec.fr

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