

# “LIFE CYCLE ASSESSMENT – FUNDAMENTALS AND PRACTISE WITH OPENLCA”

**WINTER  
SCHOOL**



**2019**

**January 28-  
February 1<sup>st</sup>**

**Nantes,  
France**



## **ECOSD**

EcoSD (Eco-conception de systèmes durables, standing for Eco-design of Sustainable Systems) Network is a French association with the objective of encouraging collaboration between academic and industrial researchers in order to create and spread advanced knowledge in eco-design fields. This initiative aims at helping a global sustainable development process at national and international scales.

## **ORGANISERS**

This summer school is organized by the doctoral school 'Engineering Sciences' (SPI) of University Bretagne Loire (UBL), supported by EcoSD network, and hosted by the Scientific and Technical Research Institute on City (IRSTV).

It is open to 15 students from SPI doctoral school and EcoSD network.

The summer school is supervised by Dr. Anne Ventura, who is researcher at French Sciences and Technological Research Institute for Transports Planning and Networks (IFSTTAR).

## PREREQUISITES

Master 2 students as minimum level.

For beginners, no basic knowledge of Life Cycle Assessment is needed.

## OBJECTIVES

**Context** : Many education programs propose Life Cycle Assessment (LCA) courses but they are currently restricted to few hours and correspond more to an initiation or an introduction to LCA than to an actual competence. However, with current and upcoming new regulations, the professional world requires not only more and more competences in LCA, but also those competences to be shared by collaborators from different educational backgrounds and professional activities. Indeed, collaborative and transdisciplinary working conditions are necessary for LCA studies in order to get relevant and in-depth results.

**Learning objectives** : this course aims at bringing fundamentals knowledge on LCA method to students from various educational backgrounds, as well as at ability to conduct a LCA study with OpenLCA open source software. The teaching conditions favors collaborative work.

Practical work rely on the use of a numerical application allowing students to be autonomous, to self test and progress at their individual rythm.

## TEACHING STAFF

- Anne Ventura (researcher at IFSTTAR)
- Lynda Aissani (researcher at IRSTEA)
- Laurédan Le Guen (researcher at IFSTTAR)

## CONTENT

	Morning 9.00 – 12.00 Courses	Afternoon 13.30 – 16.30 Practical work	Evening
Day 1	Theoretical and conceptual basis of LCA and life cycle thinking <b>Teacher</b> : Anne Ventura	Fundamentals of OpenLCA software <b>Teachers</b> : Anne Ventura, Laurédan Le Guen	Homework (individual or in groups)
Day 2	Building a LCA model <b>Teacher</b> : Anne Ventura	Conduct a simple LCA study <b>Teachers</b> : Anne Ventura, Laurédan Le Guen	
Day 3	Analysis of LCA results, parts of a system, design of a simulation plan for sensitivity analysis <b>Teacher</b> : Anne Ventura	Conduct a parametrized LCA with sensitivity analysis <b>Teachers</b> : Anne Ventura, Laurédan Le Guen	
Day 4	Actors, functionality, system modeling for multi-functionality <b>Teacher</b> : Anne Ventura	Monte Carlo simulation for calculating uncertainties <b>Teachers</b> : Anne Ventura, Laurédan Le Guen	
Day 5	LCA indicators for impact categories <b>Teacher</b> : Lynda Aissani	According to students' individual choice : <ul style="list-style-type: none"> <li>- Finish exercises if needed</li> <li>- Advanced functions of OpenLCA : spatialization</li> <li>- Individual support on student personal project</li> </ul> <b>Teachers</b> : Anne Ventura, Laurédan Le Guen, Lynda Aissani	

## TEACHING MATERIAL

All participants will receive:

- An OpenLCA user's manual in PDF format;
- A numerical copy of all numerical applications for OpenLCA exercises
- A numerical copy of courses main content (presentations or compendiums)



**ATTENTION: each student must come with its own personal computer with OpenLCA 1.7 installed (download from <http://www.openlca.org> )**

**Language:** courses can be proposed in french or english according to the audience.

## ORGANIZATION

### Number of participants:

- 10 participants maximum for 'Engineering sciences' (SPI) doctoral school of UBL
- 5 participants maximum for EcoSD network

**Location:** IRSTV, Ecole Centrale de Nantes, 1 rue de la Noë 44300 Nantes, Building T, room D028 (see campus map page 5)

Access by public transports: Tramway line 2 – Stop « Ecole Centrale – Audencia »



## REGISTRATION & CONTACT

**The training is free of charge but registration is mandatory. To register complete the form:**

<https://goo.gl/forms/JMGQNj1ekJfHPPc2>

**ATTENTION: Meals and accommodation are at the charge of participants.**



Dr. Anne Ventura

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## USEFUL LINKS

UBL: <https://en.u-bretagne.fr/>

SPI: <https://ed-spi.u-bretagne.fr/>

EcoSD: <http://www.ecosd.fr/en/>

IRSTV: <https://irstv.ec-nantes.fr/>

IFSTTAR: <http://www.ifsttar.fr/en/welcome/>

IRSTEA: <http://www.irstea.fr/en/accueil>

# MAP OF ECOLE CENTRALE DE NANTES

- A** Niveau 0: ACCUEIL - AMPHI A - HALL A, direction de la formation / scolarité / direction des relations internationales  
Niveau 1: Direction, direction de la recherche, direction de la communication  
direction générale des services, direction des ressources humaines, direction des affaires financières,  
direction des affaires institutionnelles  
salle des conseils
- B** Niveau 0: Salle de cours - INFIRMERIE  
Niveau 1: Salle de cours - Salles Informatiques - Bureau des PEI
- C** Niveau 0/1: Salle de cours - Salles multimédias
- D** Niveau 0: Direction des Systèmes d'Information - Direction de la prévention et des services généraux  
Niveau 1: Salles de TP Mécanique des Fluides et Énergétique (MFE) et TP Automatique / Robotique  
Supercalculateur  
Niveau 2: LHEEA : Laboratoire de recherche en Hydrodynamique, Énergétique et  
Environnement Atmosphérique  
→ Équipes b Hydrodynamique et Génie Océanique et Modélisation numérique  
Service Facturier
- E** Niveau 0: En Travaux
- F** Niveau 0: Salle de cours informatique - TP Mécanique, Matériaux et Génie Civil  
Niveau 1: GeM - Institut de Génie Civil et Mécanique  
Pôles Structures et Couplage et Matériaux poreux, Interactions, ouvrages  
GeM - équipes Matériaux-Ouvrages-Environnement et Structures et Simulations
- G** LHEEA > Moyens d'essais en hydrodynamique : bassin des carènes - bassin océanique
- H** LHEEA > Équipe Énergétique des Moteurs à Combustion Interne - Banc d'essais moteurs  
GeM > RMP Rapid Manufacturing Platform
- I** Atelier de Fabrication Mécanique / Plateforme RFI
- J** GeM - Institut de Génie Civil et Mécanique > dalle d'essais en génie civil  
Atelier du service technique  
Livraison de Marchandises - local colis
- L** Floor 0: AMPHI L - HALL L, Gymnase - Médiathèque - Bureau des élèves - Salle de déjeuner  
Floor 1: Communication, Langues, Entreprises et Sport - Cafétéria
- M** LHEEA > Équipe Énergétique des Moteurs à Combustion Interne - Banc d'essais moteurs  
Département Équipe Moteur - Local archives
- N** LHEEA > Équipe Dynamique de l'Atmosphère Habitée  
et équipe Énergétique des Moteurs à Combustion Interne  
Département Mécanique des Fluides et Énergétique
- O** GeM > Centre de ressources en essais dynamiques
- P** Ingénierie des Produits et Systèmes Industriels - TP Automatique / Robotique
- R** MDE (maison des élèves)
- S** AMPHI S - HALL S  
LS2N - Laboratoire des Sciences du Numérique de Nantes
- T** GeM - Institut de Génie Civil et Mécanique > Pôle Matériaux et Procédés de Fabrication  
Équipe de recherche du CERMA / IRSTV - Institut de Calcul Intensif (ICI)  
Incubateur Centrale - Audencia - ensa Nantes  
Direction du Développement et des Relations Industrielles - Centrale Nantes Alumni
-  Résidences Étudiantes
-  Département Informatique / Mathématiques  
Direction Immobilière  
Entreprises hébergées : CALLIGÉE / LEDIXIS / NEXTFLOW - SOFTWARE - INNONSEA
-  Bureau MAURIC / D-ice ENGINEERING

