Semester 7_Supplychain

Industrial Engineering & Supply Chain Management

Données Générales			
Programme Académique	**Incoming Exchange Student Courses**		Responsable(s) Module BEAUVY Elsa
Type de module : Unité d'Enseignement	**Industrial Engineering & Supply Chain Management** (LIIExp07SSCIndustrialSupplyChainMngt7)		
Crédits (ECTS)	12		
Effectif maximum	250		
Durée totale : 60h00	Periode Semester 7_Supplychain	Langue d'enseignement :	

- Incoming Exchange Student Courses
- Semesters
- Semester 7_Supplychain
- Industrial Engineering & Supply Chain Management
- Global Supply Chain And Information System

Global Supply Chain And Information System

Données Générales

Programme Académique	**Incoming Exchange Student Courses**			Responsable(s) Module : BEAUVY Elsa
Type d'EC : Cours	**Global Supply Chain And Information System** (LIIExp07EGloSupChainandInfoSys)			
TD : 4h00 TP : 4h00 Cours : 12h00 Durée totale: 20h00	Statut Obligatoire	Periode Semester 7_Supplychain	Langue d'enseignement : English	

Acquis d'apprentissage

- Judge what is at stake for Global Supply Chains
- Explain the processes of Demand Management, Suppliers Management, and Warehouse Management
- Explain what is at stake with Information Systems and ERP within the Supply Chain and more generally, the whole company
- Launch and manage a project in the context of ERP
- Create a data base in an ERP and generate data in order to lead a digital transformation

Contenu

- Information Systems in Supply Chain
- Focus on ERP
- Project Management in Supply Chain
- Demand Management
- Forecasting Management
- Warehouse and Distribution Management
- Procurement strategies and Suppliers Management

Bibliographie

G. Baglin, O. Bruel, L. Kerbache, J. Nehme, and C. van Delft, “Management Industriel et Logistique - Concevoir et piloter la Supply Chain - 6ème édition”, 2013.
A. Marchal, J-P. Gaertner, L. Bavant, “Supply Chain Management - Logistique globale”, 2ème édition, 2018.
APICS Dictionary, 3rd edition, 2008
C. A. Ptak, CFPIM, CIRM, and C. J. Smith., “Orlicky’s Material Requirements Planning”, 3rd edition
S. N. Chapman, J. R. Tony Arnold, A. K. Gatewood, and L. M. Clive, « Introduction to Materials Management », 8th edition, 2017
K. E. Kurbel, « Enterprise Resource Planning and Supply Chain Management – Functions, Business Processes and Software for Manufacturing Companies », 2013
K. Ganesh et al., Enterprise Resource Planning, Management for Professionals, DOI 10.1007/978-3-319-05927-3_2, © Springer International Publishing Switzerland 2014
K. Ganesh et al., Enterprise Resource Planning Fundamentals of Design and Implementation, 2014
A. Perrot, P. Villemus, “La boite à outils de la Supply Chain”, 2019.
Purchasing and Supply Chain Management by Robert M. Monczka, Robert B. Handfield, Larry C. Giunipero, James L. Patterson
Supplier Relationship Management: How to Maximize Vendor Value and Opportunity by Christian Schuh, Michael F. Strohmer, Stephen Easton, Michael D. Hales, Alenka Triplat
A. Rushton, P. Croucher, and P. Beker, “The Handbook of Logistics and Distribution Management”, 5th edition, 2014.

- Incoming Exchange Student Courses
- Semesters
- Semester 7_Supplychain
- Industrial Engineering & Supply Chain Management
- Manufacturing Digital Transformation

Manufacturing Digital Transformation

Données Générales

Programme Académique	**Incoming Exchange Student Courses**			Responsable(s) Module : MARCONNET Bertrand
Type d'EC : Cours	**Manufacturing Digital Transformation** (LIIExp07EManuDigiTrans)			
TD : 16h00 Cours : 4h00 Travail personnel : 22h00 Durée totale: 42h00	Statut Obligatoire	Periode Semester 7_Supplychain	Langue d'enseignement : English	

Acquis d'apprentissage

• Assimilate and implement machines and tools adapted to production
• Both capitalize data and information related to the project
• Find ways of improvement by analyzing the product/process couple in a PLM strategy
• Implementation and simulation of Factory 4.0 flows
• State the benefits of PLM (Product Lifecycle Management)
• Analyze and deploy XR in a plant (Virtual Reality/Augmented Reality)
• Acquire fundamental concepts and techniques for creating virtual reality experiences
• Learn about alternatives with low-tech solutions
• To be aware of scientific research

Contenu

- Discover SimLab software solutions for developing VR/AR applications
- Developing the first VR experience
- Understanding how SimLab software works with VR/AR equipment
• Product Lifecycle Management - PLM :
- PLM Introduction
- Windchill PLM software
- Project view
• Plant Layout 2 :
- Redo the implementation from last year, with the simulation flows of a robotic equipment

KARAKURI Challenge (eco-design and low tech):
- Working as a team to design a low-tech conveyor and reduce environmental impact
- Knowing how to write a scientific article

Bibliographie

Introduction to Materials management – Global Edition. Steve Chapman. Pearson; 8e édition (23 juin 2016)

- Incoming Exchange Student Courses
- Semesters
- Semester 7_Supplychain
- Industrial Engineering & Supply Chain Management
- The Blue Connection

The Blue Connection

Données Générales

Programme Académique	**Incoming Exchange Student Courses**			Responsable(s) Module : BEAUVY Elsa
Type d'EC : Cours	**The Blue Connection** (LIIExp07ETheBlueConnec)			
TD : 18h00 Cours : 2h00 Durée totale: 20h00	Statut Obligatoire	Periode Semester 7_Supplychain	Langue d'enseignement : English	

Acquis d'apprentissage

• Recognize and distinguish the stakes and advantages of a circular supply chain and circular economy.
• Assess the performance of a circular supply chain and combine different circular strategies
• Design a transformation strategy from a linear supply chain to a circular supply chain.

Contenu

Business simulation THE BLUE CONNECTION (publisher INCHAINGE) which students will play via a web interface (in English). ECAM La Salle is a forerunner in the deployment of this game (we work in parallel with professors from HEC). The game takes place in 6 to 8 rounds, the students work in teams of 3 or 4 and each plays the role of a manager within the fictitious company The Blue Connection:
- Sales management
- Purchasing/design department
- Supply chain management
- Finance department The company sells bicycles (only one model) to 3 different customers and is in great financial difficulty.
The goal of this game is to make the company profitable while developing a circular economy. In each round, the students test and deploy a circularity or life extension strategy (maintenance/warranty, refurbishment, remanufacturing, recycling). In the final rounds, they must choose their own strategy, implement it and explain it in an individual report.

Bibliographie

E. Weenk, R. Henzen, “Mastering the Circular Economy”, 2021
Ed Weenk YouTube channel
Closing the Loop moovie on youtube

Innovation Project S7

Données Générales			
Programme Académique	**Incoming Exchange Student Courses**		Responsable(s) Module BRAILLY Elsa
Type de module : Unité d'Enseignement	**Innovation Project S7** (LIIExp07SSCInnovProject7)		
Crédits (ECTS)	7		
Effectif maximum	100		
Durée totale : 74h00	Periode Semester 7_Supplychain	Langue d'enseignement :	

- Incoming Exchange Student Courses
- Semesters
- Semester 7_Supplychain
- Innovation Project S7
- IP Ideation

IP Ideation

Données Générales				
Programme Académique	**Incoming Exchange Student Courses**			Responsable(s) Module : BRAILLY Elsa
Type d'EC : Cours	**IP Ideation** (LIIExp07EIPIdeation)			
Cours : 4h00 Projet : 2h00 Durée totale: 6h00	Statut Obligatoire	Periode Semester 7_Supplychain	Langue d'enseignement : 	

- Incoming Exchange Student Courses
- Semesters
- Semester 7_Supplychain
- Innovation Project S7
- IP Introduction Project Management

IP Introduction Project Management

Données Générales

Programme Académique	**Incoming Exchange Student Courses**			Responsable(s) Module : BRAILLY Elsa
Type d'EC : Cours	**IP Introduction Project Management** (LIIExp07EIPManagement)			
TD : 4h00 Cours : 5h00 Projet : 4h00 Travail personnel : 9h00 Durée totale: 22h00	Statut Obligatoire	Periode Semester 7_Supplychain	Langue d'enseignement : English	

Acquis d'apprentissage

- Be able to manage a project by integrating human, organizational, technical, economic and environmental dimensions.
- Be able to use project management software (BITRIX 29).

Contenu

Project management through time and different types of management.

Definition of a project

Project Management Plan (PMP):
- Purpose and goals.
- Structure of the PMP.

Tasks, milestones and deliverables:
- Definition of a task
- Defining Project Milestones
- Definition of a deliverable

Project planning:
- Definition of project planning
- The breakdown of the project
- Task scheduling
- The schedule

Risk identification.

Quality of planning.

Planning techniques: GANTT, PERT, ...:
- The GANTT diagram
- The PERT technique
- The History Network

Budgeting a project:
- Example of budgeting

Contenu

Project management software:
- BITRIX 29

Project management.

Resource monitoring.

Prior planning of human resources.

Human/material resources management and communication:
- The climate, the working atmosphere
- Human resources monitoring.
- The follow-up of material resources

Pilot indicators:
- The notion of indicator
- Examples of indicators

The quality approach:
- Definition of the quality approach
- The quality approach during the project

Project communication management.:
- Communication plan
- Communication technologies and media

Relevant project information.

Case study corresponding to a project within a Small and Medium Industries that designs, manufactures and markets connected objects linked to the ECAM 4.0 platform.

IP Project Management Review

Données Générales				
Programme Académique	**Incoming Exchange Student Courses**			Responsable(s) Module : BRAILLY Elsa
Type d'EC : Cours	**IP Project Management Review** (LIIExp07EIPManagmtReview)			
Cours : 1h00 Projet : 2h00 Durée totale: 3h00	Statut Obligatoire	Periode Semester 7_Supplychain	Langue d'enseignement : 	

- Incoming Exchange Student Courses
- Semesters
- Semester 7_Supplychain
- Innovation Project S7
- IP Marketing

IP Marketing

Données Générales				
Programme Académique	**Incoming Exchange Student Courses**			Responsable(s) Module : BRAILLY Elsa
Type d'EC : Cours	**IP Marketing** (LIIExp07EIPMarketing)			
TD : 2h00 Cours : 8h00 Projet : 8h00 Durée totale: 18h00	Statut Obligatoire	Periode Semester 7_Supplychain	Langue d'enseignement : 	

IP Requirements

Données Générales				
Programme Académique	**Incoming Exchange Student Courses**			Responsable(s) Module :
Type d'EC : Cours	**IP Requirements** (LIIExp07EIPRequirements)			
TD : 2h00 Cours : 8h00 Projet : 8h00 Durée totale: 18h00	Statut Obligatoire	Periode Semester 7_Supplychain	Langue d'enseignement : 	

IP User Research

Données Générales				
Programme Académique	**Incoming Exchange Student Courses**			Responsable(s) Module : BRAILLY Elsa
Type d'EC : Cours	**IP User Research** (LIIExp07EIPUsersResearch)			
TD : 4h00 Cours : 4h00 Projet : 8h00 Durée totale: 16h00	Statut Obligatoire	Periode Semester 7_Supplychain	Langue d'enseignement : 	

- Incoming Exchange Student Courses
- Semesters
- Semester 7_Supplychain
- Semester Project

Semester Project

Données Générales			
Programme Académique	**Incoming Exchange Student Courses**		Responsable(s) Module
Type de module : Unité d'Enseignement	**Semester Project** (LIIExp07SSCSemesterProj)		
Crédits (ECTS)	6		
Effectif maximum	100		
Durée totale : 150h00	Periode Semester 7_Supplychain	Langue d'enseignement :	

Semester Project

Données Générales

Programme Académique	**Incoming Exchange Student Courses**			Responsable(s) Module :
Type d'EC : Cours	**Semester Project** (LIIExp06EProject)			
TD : 20h00 Projet : 130h00 Travail personnel : 130h00 Durée totale: 280h00	Statut Obligatoire	Periode Semester 7_Supplychain	Langue d'enseignement : English	

Acquis d'apprentissage

The semester project aims to enable international students to:
- Apply the theoretical and practical knowledge acquired during the semester.
- Develop skills in project management, problem-solving, and independent work.
- Produce high-quality professional work that may be technical or societal in nature.
- Present and defend their project before a jury through an oral presentation and/or a written report.

Contenu

Choice of topic: Students select a project topic in agreement with their supervisor. The topic can be technical (such as developing an application, data analysis, etc.).

Implementation: Execution of the project according to the established plan, with possible adjustments based on needs and unforeseen circumstances.

Write-up: Compilation of results, analysis, and conclusions into a written document.

Preparation for the defense: Preparation of a structured and convincing oral presentation.

- Incoming Exchange Student Courses
- Semesters
- Semester 7_Supplychain
- Sustainable Management S7

Sustainable Management S7

Données Générales			
Programme Académique	**Incoming Exchange Student Courses**		Responsable(s) Module BRAILLY Elsa
Type de module : Unité d'Enseignement	**Sustainable Management S7** (LIIExp07SSCSustainableMngt7)		
Crédits (ECTS)	4		
Effectif maximum	100		
Durée totale : 42h00	Periode Semester 7_Supplychain	Langue d'enseignement :	

- Incoming Exchange Student Courses
- Semesters
- Semester 7_Supplychain
- Sustainable Management S7
- Carbon Footprint

Carbon Footprint

Données Générales

Programme Académique	**Incoming Exchange Student Courses**			Responsable(s) Module : BRAILLY Elsa
Type d'EC : Cours	**Carbon Footprint** (LIIExp07ECarbonFootPt)			
TD : 6h00 Cours : 4h00 Projet : 4h00 Travail personnel : 9h00 Durée totale: 23h00	Statut Obligatoire	Periode Semester 7_Supplychain	Langue d'enseignement : English	

Acquis d'apprentissage

At the end of this course, the student will be able to give the definition of carbon footprint, to give the definition of the 3 scopes, to calculate the carbon footprint of some situation and to answer basic question on the carbon footprint approach.

Contenu

This course is an introduction to the carbon footprint calculation method proposed by a French association, "Association Bilan Carbone".
It will consist of a :
- Reminders about Green House Gases and introduction to global warming potential
- Definition of carbon footprint
- Definition of the 3 scopes
- Presentation of the carbon Footprint computation method
- Presentation of th Carbon Footprint approach

Prérequis

Have basic knowledge of climate issues, have basic knowledge of energy (units) and data processing, be familiar with the use of Excel spreadsheet

- Incoming Exchange Student Courses
- Semesters
- Semester 7_Supplychain
- Sustainable Management S7
- Operational Quality And Lean Management

Operational Quality And Lean Management

Données Générales

Programme Académique	**Incoming Exchange Student Courses**			Responsable(s) Module : COUROUGE Olivier
Type d'EC : Cours	**Operational Quality And Lean Management** (LIIExp07EOpQualLeanMngt)			
TD : 12h00 Cours : 4h00 Durée totale: 16h00	Statut Obligatoire	Periode Semester 7_Supplychain	Langue d'enseignement : English	

Acquis d'apprentissage

During the S6 (Quality) we discovered what it the goal of the quality management, and how to detect anomalies (histograms, Pareto method, SPC).
The guideline of this semester is now to find the root causes of these anomalies, and to quantify theim (experience plans).
As we found the origin of the problems, we now want to use the adapted tools to solve theim (Product FMECA – Lean-6sigma tools).
- Detect the causes of quality anomalies and quantify their respective effects.
- Use the appropriate tools to carry out actions to resolve the detected anomalies in a quality approach : Lean - 6 sigma.

Contenu

Introduction to experience plans :
- What is an experience plan and how to implement it ?
- Several notions : factors, levels of the factors, mathematical model
- Experience plans : 2 factors and 2 levels
- Experience plans : 3 factors and 2 levels

Product FMECA :
One case of study to understand what is the purpose of product FMECA and how to implement it : how to reduce the problem at the conception phase of a product

Lean-6 sigma tools :
Discovery of the different lean tools in the context of a problem-solving approach :
- What is the Lean (context and historical approach)
- What is 6 sigma (context and historical approach)
- What are the tools related to these topics (DMAIC, 5S, Ishikawa, root causes : 5W…)
- Possiblity to implement all of these tools with one tutorial : A3 problem solving method.

Prérequis

No real pre-requisites are necessary to understand the different notions, but knowing the context and the guideline of the quality approach of this two semesters is better to understand why we do that.

- Incoming Exchange Student Courses
- Semesters
- Semester 7_Supplychain
- Sustainable Management S7
- Research Methods

Research Methods

Données Générales				
Programme Académique	**Incoming Exchange Student Courses**			Responsable(s) Module : TOURET Thomas
Type d'EC : Cours	**Research Methods** (LIIExp07EResearchMethd)			
TD : 8h00 Cours : 4h00 Durée totale: 12h00	Statut Obligatoire	Periode Semester 7_Supplychain	Langue d'enseignement : 	

Systems Engineering S7

Données Générales			
Programme Académique	**Incoming Exchange Student Courses**		Responsable(s) Module MANNAH Marc Anthony
Type de module : Unité d'Enseignement	**Systems Engineering S7** (LIIExp07SSCSystEEng)		
Crédits (ECTS)	1		
Effectif maximum	100		
Durée totale : 18h00	Periode Semester 7_Supplychain	Langue d'enseignement :	

- Incoming Exchange Student Courses
- Semesters
- Semester 7_Supplychain
- Systems Engineering S7
- Electrical Machine & Drives

Electrical Machine & Drives

Données Générales

Programme Académique	**Incoming Exchange Student Courses**			Responsable(s) Module :
Type d'EC : Cours	**Electrical Machine & Drives** (LIIExp07EElecMachDrives)			
TD : 6h00 TP : 4h00 Cours : 8h00 Travail personnel : 14h00 Durée totale: 32h00	Statut Obligatoire	Periode Semester 7_Supplychain	Langue d'enseignement : English	

Acquis d'apprentissage

By the end of this module, students will be able to:
1. Outline the basic characteristics of DC and AC motors and their performance parameters
2. Describe the principle of operation and control of DC and AC motors
3. Recognizing the main concepts in machines modeling, electronic control and control strategies
4. Distinguish between advanced control methods: scalar control, field oriented control, direct torque control
5. Design and Generate complete electric drive models and simulations

Contenu

This course covers the basic characteristics of DC and AC motors and describe their principle of operation and control within a power electronic environment. Basics in power electronics, electric machines and control circuits are reviewed and the overall systems is studied. Control techniques for DC drives are underlined and the four-quadrant operation is analysed. Control strategies for AC drives are discussed as well, mainly the scalar control, the field oriented control and the direct torque control. Detailed modelling of the control of induction motors using the FOC method is carried out.

o Electrical Machines Drives – General Overview: Review on Control Systems, Review on Power Electronics, Review on Electrical Machines
o DC Motors Control: Introduction to DC Drives, Four-Quadrant Control, Closed Loop Control, Electronic Control
o AC Motors Control: Basic Control of Induction Motors (Vs, Vr, F, V/F), Scalar Control
o AC Motors Control: Understanding the Challenges, Park Transformation (dq domain), Dynamic Model of Induction Motors, DC Machine Analogy, Field Oriented Control

Prérequis

Prerequisites:
- Power Electronics
- Electric Machines
- Control theory

Bibliographie

Recommended Resources:
Rashid, M., (2013), Power Electronics: circuits, devices and applications, 4th edition, [9780273769088], Pearson
Krause, P., Wasynczuk, O., Sudhoff, S., Pekarek, S., (2013), Analysis of Electric Machinery and Drive Systems, 3rd Edition, [9781118024294], Wiley
Mohan, N., (2012), Electric Machines and Drives, 1st Edition, [978-1118074817], Wiley
Wildi, T., (2013), Electrical Machines, Drives and Power Systems, 6th Edition, [9781292024585], Pearson