CENTRALE NANTES

BACHELOR OF SCIENCE IN ENGINEERING

2024-2025

YEAR 2

PROGRAMME SUPERVISOR :

Gregory LEGRAIN

Bachelor of science in engineering

YEAR 2 – Autumn Semester

CORE COURSES

Course code	Title	ECTS Credits
MATHSVI	Maths VI : Analysis III	UE31 12 ects
MATHSV	Maths V : Probability and Statistics	
ACB	Automatic Control Basics	
IAS	Industrial Automation Systems	
THERMODYN1	Thermodynamics	UE32 12 ects
VIBRATIONS	MECH II : Vibrations	
STRUCTMECH	MECH IV Structural Mechanics	
HEATTRANS1	Heat Transfer 1	
FLE3	FLE3	UE33 6 ects
BUSEN3	Business English 3	
SHS3	SHS3	
PREPRO3	Pre-professionnal activities 3	
ENGPROJ1	Engineering Project I	

Bachelor of science in engineering

YEAR 2 – Spring Semester

CORE COURSES

Course code	Title	Credits
MATHSVII	MATHS VII : Numerical Analysis	UE41 4 ects
DATASCI	CS Introduction to Data Science	
MANUFBASIS	Manufacturing I : Basis	UE42 12 ects
IENGBASIS	Industrial engineering Basis	
MECHDEFBODIES	MECH V : Mechanics of deformable bodies	
FLUIDMECHBASIS	MECH VI : Fluid Mechanics Basis	
FLE4	FLE4	UE43 9 ects
BUSEN4	Business English 4	
SHS4	SHS4	
PREPRO4	Pre-professionnal activities 4	
SUSTAIN2	Sustainable engineering II	
ENGPROJ2	Engineering Projet II	
NSINTERNSHIP	Non-skilled Internship	UE44 5 ects

BACHELOR OF SCIENCE IN ENGINEERING

2024/2025 - Year 2 - Autumn Semester - UE31

Maths VI: Analysis III [BSC_MATHSVI]

LEAD PROFESSOR(S): Mazen SAAD

Requirements

Analysis I, Analysis II

Objectives

Know how to study functions of several variables and how to solve some types of first and second order ODEs.

Course contents

1- Multivariable functions, limits, continuity, partial derivatives, Taylor series formula, minimum, maximum and saddle points
2- Double and triple integrals, line integral
2- First-order ordinary differential equations: Euler's method, equation with separate variables, linear equations
3- Second-order linear ordinary differential equations: homogeneous case, homogeneous case with constant coefficients, non homogeneous case, solution by variation of parameters

Course material

1. Erwin Kreyszig, Advanced Engineering Mathematics, 10th edition, John Wiley & Sons, 2010
2. Robert G. Bartle, Donald R. Sherbert"Introduction to Real Analysis", Wiley, 2011

Assessment

Individual assessment: EVI 1 (coefficient 0.3)
EVI 2 (coefficient 0.7)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	-	10 hrs	12 hrs	0 hrs	0 hrs	2 hrs

BACHELOR OF SCIENCE IN ENGINEERING

2024/2025 - Year 2 - Autumn Semester - UE31

Maths V: Probability and Statistics [BDM_MATHSV]

LEAD PROFESSOR(S): Claire BRECHETEAU

Requirements

Objectives

Know and understand the basic concepts in probability and statistics. Know how to compute classical probabilities, based on numeration or on the Bayes rule. Master classical probability distributions. Being able to compute statistical descriptors (mean, variance, median, mode, quantiles, cumulative distribution functions). Being able to compute basic confidence intervals, and being able to apply classical statistical tests on the mean.

Course contents

1 - Bases on Sets theory and Enumeration
2 - Introduction to probabilities : from events to random variables
3 - Discrete and continuous random variables
4 - Convergence of random variables and Limit theorems
5 - Estimators in Statistics and Confidence intervals
6 - Statistical tests

Course material

Assessment

Individual assessment: EVI 1 (coefficient 0.3)
EVI 2 (coefficient 0.7)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	-	12 hrs	12 hrs	0 hrs	0 hrs	2 hrs

BACHELOR OF SCIENCE IN ENGINEERING

2024/2025 - Year 2 - Autumn Semester - UE31

Automatic Control Basics [BSC_ACB]

LEAD PROFESSOR(S): Ina TARALOVA

Requirements

Linear Algebra, Differential and Integral calculus

Objectives

This course is designed for bachelor students looking to develop their skills in electrical/electronic and control systems engineering, with the emphasis on applying the key principles to practical situations. It includes the fundamentals of control theory and the use of Matlab and Simulink (the mathWorks graphical programming environment for modeling, simulating and analyzing multi-domain dynamic systems).

Course contents

Part I: Partial Francion Expansion. First and second order systems time responses of LTI systems, characteristics, canonical form. Exercises on LTI system analysis using Matlab and Simulink
LTI (Linear Time invariant Systems)
Part II: Frequency responses, Magnitude and phase, Bode diagram. Nyquist plot. Stability criteria, stability margins in the frequency domain. Introduction to the design of control laws.

Course material

Norman S. Nise, Control Systems Engineering, Ed. Wiley, 2019 ISBN: 978-1-119-41472-8

R. C. Dorf and R. H. Bishop, Modern Control Systems, Pearson Education, Upper Saddle River, NJ, twelfth edition, 2011, ISBN-13:978-0-13-602458-3

G. Franklin, et al., “Feedback Control of Dynamic Systems”, Pearson

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	-	16 hrs	2 hrs	4 hrs	0 hrs	2 hrs

BACHELOR OF SCIENCE IN ENGINEERING

2024/2025 - Year 2 - Autumn Semester - UE31

Industrial Automation Systems [BSC_IAS]

LEAD PROFESSOR(S): Abdelhamid CHRIETTE / Grégory LEGRAIN

Requirements

BDM_MATHSII, BDM_MATHSIV
BDM_INFOI, BDM_INFOII, BDM_INFOIII, BDM_INFOIV

Objectives

After completing this lecture, students should be able to:

Know the hardware organization of PLCs (Programmable Logic Controllers), its input-output and communication peripherals.

Able to recognize the structure and components of automated systems.

Able to analyze automation problems using combinatorial and sequential logic.

Be able to represent solutions by logic circuits and their translation into programmed logic: Ladder, GRAFCET.

Be able to program the control of simple processes using PLCs, sensors and actuators.

Course contents

History
Automatic system
Programmable Logic Controllers (PLC)
Basics of the language
Basic structures
Particular structures

Course material

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	-	6 hrs	10 hrs	8 hrs	0 hrs	0 hrs

BACHELOR OF SCIENCE IN ENGINEERING

2024/2025 - Year 2 - Autumn Semester - UE32

Thermodynamics 1 [BSC_THERMODYN1]

LEAD PROFESSOR(S): Georges SALAMEH

Requirements

physics

Objectives

Introduce the main concepts of thermodynamics applied to fluids and machines

Course contents

General information about systems and settings ;
Pressure and temperature ;
State functions in thermodynamics (internal energy, enthalpy, entropy)
Work and heat ;
Thermodynamic Principles in closed system ;
Gas kinetics; ideal gas equation ;
Thermodynamic transformations (isochoric, isothermal, isobaric, adiabatic).
Principles of thermodynamics – open system

Course material

Introduction to Engineering Thermodynamics, 2nd ed. R.E. Sonntag and C. Borgnakke, John Wiley & Sons, New York, 2007

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	-	10 hrs	12 hrs	null hrs	0 hrs	2 hrs

BACHELOR OF SCIENCE IN ENGINEERING

2024/2025 - Year 2 - Autumn Semester - UE32

MECH II: Vibrations [BSC_VIBRATIONS]

LEAD PROFESSOR(S): Grégory LEGRAIN

Requirements

STATICS
DYNAMICS
MATHEMATICS

Objectives

Vibrations play an important rôle in engineering. Although they can be wanted on purpose, vibrations are usually undesirable as they can prevent the proper functioning of the systems.
This course focuses on the study of vibrations of system of mass points.

At the end of this course, the students will:
- be able to obtain the equation of motion of a system of solids by means of Lagrange equations
- write the response of a mass point or a system of mass points to free or forced vibrations

Course contents

- Dynamic of systems of point masses
- Lagrange equations
- 1 dof free and forced vibrations
- N dofs free and forced vibrations

Course material

Engineering Mechanics 3, Gross, Hauger, Schröder, Wall and Govindjee. Springer

Assessment

Collective assessment: EVC 1 (coefficient 0.3)

Individual assessment: EVI 1 (coefficient 0.7)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	-	10 hrs	8 hrs	4 hrs	0 hrs	2 hrs

BACHELOR OF SCIENCE IN ENGINEERING

2024/2025 - Year 2 - Autumn Semester - UE32

MECH IV Structural Mechanics [BSC_STRUCTMECH]

LEAD PROFESSOR(S): Vito RUBINO

Requirements

Statics

Objectives

Course contents

This course covers the following topics:
- Kinematics and static of rigid body systems
- Determination of support reactions
- Internal beam reactions
- Statically determinate beam systems (including multi-span beams, trusses, three-hinged arches and closed-frame structures)

Course material

- Carpinteri, Structural Mechanics Fundamentals, CRC Press, 2014.
- Gere and Goodno, Mechanics of Materials, Cengage Learning, 2011.

Assessment

Collective assessment: EVC 1 (coefficient 0.3)

Individual assessment: EVI 1 (coefficient 0.7)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	-	8 hrs	10 hrs	4 hrs	0 hrs	2 hrs

BACHELOR OF SCIENCE IN ENGINEERING

2024/2025 - Year 2 - Autumn Semester - UE32

Heat Transfer 1 [BSC_HEATTRANS1]

LEAD PROFESSOR(S): Ernesto MURA

Requirements

Thermodynamics 1

Objectives

Analysis and modelling of heat transfer for elementary systems. Study of basic and stationary heat transfer problems considering conductive and convective heat transport phenomena; as stand alone as well as in coupled condition.

Course contents

Energy and Mass balances: use of the first principle for setting of simple problems involving heat transfer. Discrimination between the different heat transfer phenomena (radiation, convection, conduction).
Concepts of heat, heat flow and internal energy.
Use of the energy equation balance in reduced forms: steady state and monodimensional cases (cartesian, spherical cylindrical coordinates). Problem with internal produced heat.
Conduction (Fourrier Law in one dimensional form - heat balance in steady state): introduction to the conduction phenomena and material properties for the thermal field description. Example of the finite bar under a defined thermal field.
Convection: Introduction to the Newton's Law. Concept of heat transfer coefficient. Conceptual relationship with the velocity profile of a gas (introduction of the concept of turbulence and Reynold's Number). Example of the heated surface for the forced convection and of the heated flat plate for the free convection. Competition between conduction and convective resistence: Nusselt's Number.
Concept of velocity and thermal boundary layer.

Course material

R.Byron Bird, Transport Phenomena, Revised Second Edition, Jhon Wiley & Sons, Inc. New York 2007.
C.P. Kothandaraman, Fundamental of Heat and Mass Transfer, Revised Third Edition, New age International Publisher, New Delhi 2006

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	-	10 hrs	12 hrs	null hrs	0 hrs	2 hrs

BACHELOR OF SCIENCE IN ENGINEERING

2024/2025 - Year 2 - Autumn Semester - UE33

FLE3 [BSC_FLE3]

LEAD PROFESSOR(S): Stéphanie MASSOT

Requirements

N/A

Objectives

The objective is to familiarize international students with the French language and culture through communicative tasks and by teaching situations focused on comprehension and oral practice. In addition, the acquisition of vocabulary, syntax and pronunciation completes the training in order to acquire the necessary knowledge to communicate in everyday situations.

Students acquire general skills: specific communicative skills, language skills (knowledge of grammar, syntax and phonology) as well as social and cultural knowledge allowing them to use the appropriate vocabulary in communication situations. everyday life. Sociolinguistic and pragmatic skills are also required.

Course contents

Learners will be able to use the foreign language in a simple way for the following purposes:

Establishing and maintaining social and professional contacts / interact in daily life, particularly:

- Request a service / request authorization
- Propose, accept, refuse
- Warn of an impediment
- Explain a health problem
- Express the obligation, the possibility, the impossibility
- Suggest, give advice
- Non-verbal communication: gestures to communicate.

Course material

We design our materials from press articles, television news, news magazines and the Internet. We also use digital tools such as Kahoot, Flipgrid or Padlet to boost our courses.

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	-	0 hrs	40 hrs	0 hrs	0 hrs	0 hrs

BACHELOR OF SCIENCE IN ENGINEERING

2024/2025 - Year 2 - Autumn Semester - UE33

Business English 3 [BSC_BUSEN3]

LEAD PROFESSOR(S): Anna POLONYI

Requirements

Objectives

To communicate effectively and confidently on specific subjects especially in specific professional situations

Course contents

Meetings
- Planning and preparation
- Agenda
- Chairing
- Formal vocabulary and phrases
- Opinions, making a point, agreeing/disagreeing
- Minutes
- Closing and follow up

Conferences and debates
-Planning and preparation
- Formal expressions
- Delivering an idea
- Expressing views and opinions
- Concluding

Course material

- teacher led with student input
- group discussions
- student and teacher feedback
- role plays

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	-	0 hrs	20 hrs	0 hrs	0 hrs	0 hrs

BACHELOR OF SCIENCE IN ENGINEERING

2024/2025 - Year 2 - Autumn Semester - UE33

SHS3 [BSC_SHS3]

LEAD PROFESSOR(S): Julie BERGER

Requirements

None

Objectives

Whether for academic applications, grant writing or business design, we all need essential storytelling skills

Course contents

Why are stories the best way to convey information? And what makes a good story ? This workshop will draw on exeamples from North American and international literature to see how creators hook our hearts and engage our empathy. With generative writing prompts, close reading and constructive, critical feedback, students wills sharpen their storytelling skills, strenghtn self-knowledge and overcome fear of failure in order to take risks and produce stories tha engage the heart as well as the mind.

Course material

None

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	-	0 hrs	24 hrs	0 hrs	0 hrs	0 hrs

BACHELOR OF SCIENCE IN ENGINEERING

2024/2025 - Year 2 - Autumn Semester - UE33

Pre-professionnal activities 3 [BSC_PREPRO3]

LEAD PROFESSOR(S): Grégory LEGRAIN

Requirements

Objectives

The objective of this course is to provide an opening to business world through various activities.

Course contents

- Company tours
- Professional days
- Company driven workshops
- Hackaton
- Startup challenge
- Ideation workshops
- Innovation workshops
- Industrial mentoring

Course material

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	-	0 hrs	36 hrs	0 hrs	0 hrs	0 hrs

BACHELOR OF SCIENCE IN ENGINEERING

2024/2025 - Year 2 - Autumn Semester - UE33

Engineering Project I (60h) [BSC_ENGPROJ1]

LEAD PROFESSOR(S): Tugdual LE NÉEL

Requirements

None

Objectives

Learn how to manage a project.

Course contents

Make a bike.

Course material

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	-	8 hrs	16 hrs	0 hrs	0 hrs	0 hrs

BACHELOR OF SCIENCE IN ENGINEERING

2024/2025 - Year 2 - Spring Semester - UE41

Maths VII: Numerical Analysis [BSC_MATHSVII]

LEAD PROFESSOR(S): Françoise FOUCHER

Requirements

Analysis and linear algebra

Objectives

To know and be able to implement methods of approximate solution of various mathematical problems.

Course contents

1- Non-linear equations: bisection method, fixed-point method, Newton's method
2- Systems of linear equations: direct methods (Gauss, LU), iterative methods (Jacobi, Gauss-Seidel)
3- Iterative power method to approximate eigenvalues and eigenvectors
4- Interpolation and approximation: Lagrange interpolation, piecewise interpolation, least squares approximation
5- Numerical integration: trapezium rule, Simpson's rule, composite formulae and convergence
6- Numerical methods for differential equations: Euler's method, Runge-Kutta methods

Course material

Grégoire Allaire, Sidi Mahmoud Kaber, Numerical linear algebra, Springer, 2008.

Assessment

Individual assessment: EVI 1 (coefficient 0.3)
EVI 2 (coefficient 0.7)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	-	10 hrs	10 hrs	4 hrs	0 hrs	2 hrs

BACHELOR OF SCIENCE IN ENGINEERING

2024/2025 - Year 2 - Spring Semester - UE41

CS Introduction to Data Science [BSC_DATASCI]

LEAD PROFESSOR(S): Grégory LEGRAIN

Requirements

* MATHSI
* MATHSII
* MATHSIII
* MATHSIV
* MATHSV
* MATHSVI

Objectives

Data Science is a multi-disciplinary field that helps to identify trends, patterns, connections and correlations in large data sets. It is built on programming skills, domain knowledge, and mathematical and statistical knowledge.

The objective of this course is to introduce the basis of data science to engineers. Theoretical and practical aspects are both considered in a comprehensive way.

Course contents

- Overview of the data science pipeline
- Data collection and pre-processing
- Data analysis with statistical methods
- Data analysis with machine learning methods
- Visualisation methods

Course material

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	-	10 hrs	0 hrs	4 hrs	10 hrs	0 hrs

BACHELOR OF SCIENCE IN ENGINEERING

2024/2025 - Year 2 - Spring Semester - UE42

Manufacturing I: Basis [BSC_MANUFBASIS]

LEAD PROFESSOR(S): Grégory LEGRAIN

Requirements

Objectives

The objective of this course is to present the basis of manufacturing activities (machining, joining) for both metallic and non-metallic materials.

Course contents

Product realization steps
Conventional machining
Joining Processes – welding
Processes for non metallic materials

Course material

Assessment

Individual assessment: EVI 1 (coefficient 1)
EVI 2 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	-	4 hrs	4 hrs	16 hrs	0 hrs	0 hrs

BACHELOR OF SCIENCE IN ENGINEERING

2024/2025 - Year 2 - Spring Semester - UE42

Industrial engineering Basis [BSC_IENGBASIS]

LEAD PROFESSOR(S): Grégory LEGRAIN / Inès DIB

Requirements

Objectives

Understand the flows in a production environment
Forecast demand and plan related activities

Course contents

* Physical flows
* Demand and forecasting
* Inventory management
* Data management (Bill of material, routings)

Course material

http://www.apics.org/
Handbook of industrial and systems engineering, A. Badiru, 2013

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	-	10 hrs	10 hrs	4 hrs	0 hrs	0 hrs

BACHELOR OF SCIENCE IN ENGINEERING

2024/2025 - Year 2 - Spring Semester - UE42

MECH V: Mechanics of deformable bodies [BSC_MECHDEFBODIES]

LEAD PROFESSOR(S): Vito RUBINO

Requirements

Statics, Structural Mechanics

Objectives

Course contents

This course covers the following topics:
- Analysis of strain and stress
- Theory of elasticity
- Saint Venant problem
- Beams and plates in flexure
- Statically indeterminate beam systems

Course material

- Carpinteri, Structural Mechanics Fundamentals, CRC Press, 2014.
- Gere and Goodno, Mechanics of Materials, Cengage Learning, 2011.

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	-	8 hrs	8 hrs	6 hrs	0 hrs	2 hrs

BACHELOR OF SCIENCE IN ENGINEERING

2024/2025 - Year 2 - Spring Semester - UE42

MECH VI: Fluid Mechanics – Basis [BSC_FLUIDMECHBASIS]

LEAD PROFESSOR(S): Boris CONAN

Requirements

Mathematical operators
Vectors, tensors

Objectives

This course introduces the fundamental principles governing incompressible fluids.

On completion of the course, students should be able to
- understand the basic physics of fluid flows,
- understand and manipulate the Navier-Stokes equations and associated mathematical operators
- solve basic problem of hydrostatics
- use dimensional analysis to estimate orders of magnitude of different flow processes

Course contents

Courses and seminar on:
- phenomenology
- description and manipulation of the Navier-Stokes equations
- dimensionless numbers
- hydrostatics

10h of lesson
14h of seminars on applied exercices

Course material

Fundamentals of Fluid Mechanics, B.R. Munson, D.F. Young, T.H. Okiishi, (4th edition) 2002, Wiley

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	-	10 hrs	12 hrs	null hrs	0 hrs	2 hrs

BACHELOR OF SCIENCE IN ENGINEERING

2024/2025 - Year 2 - Spring Semester - UE43

FLE4 [BSC_FLE4]

LEAD PROFESSOR(S): Stéphanie MASSOT

Requirements

N/A

Objectives

The objective is to familiarize international students with the French language and culture through communicative tasks and by teaching situations focused on comprehension and oral practice. In addition, the acquisition of vocabulary, syntax and pronunciation completes the training in order to acquire the necessary knowledge to communicate in everyday situations.

Students acquire general skills: specific communicative skills, language skills (knowledge of grammar, syntax and phonology) as well as social and cultural knowledge allowing them to use the appropriate vocabulary in communication situations. everyday life. Sociolinguistic and pragmatic skills are also required.

Course contents

Learners will be able to use the foreign language in a simple way for the following purposes:

Relating events and describing experiences (present, past, future)

- Describe the environment in which you live
- Tell your experience of life in Nantes
- Tell a story
- Present a French personality (biography)
- Describe your educational background
- Describe your future plans
- Describe wishes, desires

Course material

We create our materials from press articles, television news, news magazines and the Internet. We also use digital tools such as Kahoot, Flipgrid or Padlet to boost our courses.

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	-	0 hrs	40 hrs	0 hrs	0 hrs	0 hrs

BACHELOR OF SCIENCE IN ENGINEERING

2024/2025 - Year 2 - Spring Semester - UE43

BUSEN4 [BSC_BUSEN4]

LEAD PROFESSOR(S): Anna POLONYI

Requirements

Objectives

To become familiarized with the general concepts of intercultural communication
To develop sensitivity towards the inherent value of cultural differences in a professional context
To be able to communicate across different cultures effectively

Course contents

Current approaches to intercultural communication in social sciences
Multiculturalism & interculturalism
Diversity in the workplace
Equity vs. equality
Integration vs. assimilation
The problem with stereotypes

Methods:

Research and analysis of current theories
Discussions based on the reading and analysis of case studies
Final group presentation
Continuous assessment / participation
Final group presentation

Course material

https://en.unesco.org/interculturaldialogue/core-concepts
Manual for developing intercultural competencies: story circles. https://unesdoc.unesco.org/ark:/48223/pf0000370336
Hall, Stuart. Culture, media, language : working papers in cultural studies. https://archive.org/details/culturemedialang0000unse/page/8/mode/2up
https://www.crossculture.com/

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	-	0 hrs	20 hrs	0 hrs	0 hrs	0 hrs

BACHELOR OF SCIENCE IN ENGINEERING

2024/2025 - Year 2 - Spring Semester - UE43

SHS4 [BSC_SHS4]

LEAD PROFESSOR(S): Julie BERGER

Requirements

None

Objectives

Managing cultural shock - Confronting multicultural conflicts - Remote communication methods - Increasing the cohesion of a multicultural team

Course contents

Managing a multicultural team - Oh, how shocking! We've all had culture shock at one time or another and in the world of work, it can take on catastrophic proportions. Whether you are French or foreign, you will undoubtedly have to work within a multicultural team during your career; how to work in harmony? The objective of this course is to understand and then overcome the challenges of multiculturalism in the world of work.

Course material

None

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	-	0 hrs	24 hrs	0 hrs	0 hrs	0 hrs

BACHELOR OF SCIENCE IN ENGINEERING

2024/2025 - Year 2 - Spring Semester - UE43

Pre-professionnal activities 4 [BSC_PREPRO4]

LEAD PROFESSOR(S): Grégory LEGRAIN

Requirements

Objectives

The objective of this course is to provide an opening to business world through various activities.

Course contents

- Company tours
- Professional days
- Company driven workshops
- Hackaton
- Startup challenge
- Ideation workshops
- Innovation workshops
- Industrial mentoring

Course material

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	-	0 hrs	36 hrs	null hrs	0 hrs	0 hrs

BACHELOR OF SCIENCE IN ENGINEERING

2024/2025 - Year 2 - Spring Semester - UE43

Sustainable engineering II [BSC_SUSTAIN2]

LEAD PROFESSOR(S): Thomas CORRE

Requirements

- Sustainable engineering I
- Product design methodology

Objectives

- Awareness of the challenges of ecological transition, with a focus on local aspects (water, air and soil pollution, etc.)
- Knowledge of product life cycles and associated impacts
- Notion of collective responsibility: corporate social responsibility (ISO 26 000, 2010)

Course contents

- Eco-design and product life cycle
- Introduction to carbon footprinting and practical implementation
- Defining and monitoring organizations' decarbonization trajectories

Course material

- Ashby, M. F. (2012). Materials and the environment: eco-informed material choice. Elsevier.
- ISO 26000 :2010 ISO 26000:2010, Guidance on social responsibility
- IRP (2020). Resource Efficiency and Climate Change: Material Efficiency Strategies for a Low-Carbon Future.

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	-	8 hrs	4 hrs	4 hrs	0 hrs	0 hrs

BACHELOR OF SCIENCE IN ENGINEERING

2024/2025 - Year 2 - Spring Semester - UE43

Engineering Project II (72h) [BSC_ENGPROJ2]

LEAD PROFESSOR(S): Tugdual LE NÉEL

Requirements

None

Objectives

Learn how to manage a project.

Course contents

Make a goodie. Make a bike.

Course material

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	-	12 hrs	24 hrs	0 hrs	0 hrs	0 hrs