CENTRALE NANTES

ENGINEERING IN THE FIELD OF CONSTRUCTION AND PUBLIC WORKS

2022-2023

Year 1

PROGRAMME SUPERVISOR

Jean-Sebastien LE BRIZAUT

Year 1

Course unit	ECTS Credits	Course type	Course code	Title
UE100	10			
		Core course	BTP1_ENT	Business Skills
UE101	5			
		Core course	BTP1_APRA	Analysis of Professional Practices
		Core course	BTP1_ESE	Societal challenges for the companies
		Core course	BTP1_SSAT	Social sciences applied to work
UE102	6			
		Core course	BTP1_ANGL	English
		Core course	BTP1_CONF	Conferences
		Core course	BTP1_PSI	PPP - International Experience
UE103	4			
		Core course	BTP1_ECOG	General economy
		Core course	BTP1_GEFI	Financial Administration
UE104	4			
		Core course	BTP1_GEQU	Management of quality
		Core course	BTP1_SECH	Security
UE105	7			
		Core course	BTP1_CET	Technical trades
		Core course	BTP1_MOA	Project owner / Prime contractor
		Core course	BTP1_PGCO	Building technology
UE106	9			
		Core course	BTP1_FODUB	Formulations and durability of cement-based materials
		Core course	BTP1_MATH	Mathematics
		Core course	BTP1_PHYS	Physics
UE107	7			
		Core course	BTP1_GEOT	Geotechnical engineering
		Core course	BTP1_RDM	Strength of materials
UE108	8			
		Core course	BTP1_ELEC	Electricity
		Core course	BTP1_MATE	Materials
		Core course	BTP1_MMC	Continuum Mechanics

Business Skills [BTP1_ENT]

LEAD PROFESSOR(S): Jean-Sebastien LE BRIZAUT / Marie GOUGEON

Objectives

Validation of business activities, acquired skills, entrusted responsibilities and apprenticeship in the engineering profession

Course contents

Course material

Assessment

Individual assessment: EVI 1 (coefficient 1)

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

Analysis of Professional Practices [BTP1_APRA]

LEAD PROFESSOR(S): Jean-Sebastien LE BRIZAUT / Marie GOUGEON

Objectives

- Objectives: To enable apprentices to move from a “student” position to a “professional” position through:
- Reflection on their learning methods and methodologies,
- Identification of efficient practices,
- An exchange between peers,
- Linking the two training centres, the school and the host company.

Course contents

no standard plan

Course material

no library for apprentices

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
French	-	0 hrs	0 hrs	6 hrs	0 hrs	0 hrs

Societal challenges for the companies [BTP1_ESE]

LEAD PROFESSOR(S): Jean-Sebastien LE BRIZAUT / Stéphane GUYARD

Objectives

The "Societal and Business Issues" module aims to acquire skills in terms of a scientific approach to analysing the functioning and evolution of companies (questioning, data collection and analysis). This acquisition is based on the realization, during the first two years of training, of a collective study (in groups of 4 or 5 apprentices) on subjects that question the relationship between contemporary issues of societies and the functioning, the evolutions of companies.

Course contents

Year 1: Exploration phase

Course material

Stéphane Beaud, Florence Weber, Guide de l'enquête de terrain : produire et analyser des données ethnographiques, Paris : Éd. la Découverte, coll. « Guide repères », 1997

Assessment

Individual assessment: EVI 1 (coefficient 1)

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

Social sciences applied to work [BTP1_SSAT]

LEAD PROFESSOR(S): Fabien THOMAS / Jean-Sebastien LE BRIZAUT

Objectives

Acquire a rational approach to questioning within the framework of a practice related to human work; acquire a methodology of data collection adapted to this questioning; appropriate knowledge related to a practice related to human work; make join "practical" and "theories" based on the professional experience of engineering students in apprenticeship (in conjunction with the practice analysis sessions); transforming this knowledge into professional know-how

Course contents

Methodology of the problem and documentation; Work as construction and social representation; The management function; Theories of organizations; Change and Innovation

Course material

Henri MINTZBERG, Danièle LINHART, Frédéric MISPELBLOM-BEYER, Eric DELAVALLEE, Frédéric LORDON, Thomas PIKETTY, Renaud SAINSAULIEU, Vincent DE GAULEJAC, Jean-François DORTIER, Mathew CRAWFORD, Alain DENEAULT, Marie-Anne DUJARIER, Barbara STIEGLER, Marie PEZE, Christophe DEJOURS, etc.

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
French	-	0 hrs	0 hrs	49 hrs	0 hrs	0 hrs

English [BTP1_ANGL]

LEAD PROFESSOR(S): James RATCLIFF

Objectives

Objectives:

- prepare students to apply for internship in English-speaking country
- prepare students for life in a company in English-speaking country
- prepare students for living abroad, integrating with English-speakers
- prepare students for TOEIC test (grammar, vocabulary, listening, reading) Objective - TOEIC score 785

Course contents

Training program/syllabus :

Communicative approach:

- CVs in English
- Cover Letters in English
- Video CV scripts
- Describing companies and responsibilities within companies
- Job interview practice
- Telephoning for job interviews. Leaving a message
- Telephoning: arranging a meeting.
- Describing processes
- Numbers, figures, prices, measurements, alphabet, graphs, charts etc.
- Question forms
- Communication activities in various contexts - professional, social, current affairs
- Grammar review according to individual needs
- Vocabulary for TOEIC
- Professional emails
- Professional role-plays
- Presentations skills & practice
- Case studies
- Meetings language
- Social English
- Cultural Differences – working in UK, US, Australia etc

Regular Mock T.O.E.I.C practice tests

Course material

Barron's TOEIC Test 6th Edition
English Grammar in Use with answers - Raymond Murphy
Les Guides Officiels du Test TOEIC. Grammaire Vocabulaire du Test TOEIC - Hachette
L'intégrale TOEIC - Nathan
200% TOEIC 2021 - Ellipses

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
English	-	0 hrs	80 hrs	0 hrs	0 hrs	0 hrs

Conferences [BTP1_CONF]

LEAD PROFESSOR(S): Jean-Sebastien LE BRIZAUT

Objectives

Introduction to Building Information Modelling (BIM)

Course contents

Course material

Assessment

Individual assessment: EVI 1 (coefficient 1)

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

PPP - International Experience [BTP1_PSI]

LEAD PROFESSOR(S): Alan BALL / James RATCLIFF

Objectives

Objectives:

Bring learners to the 785-point level of TOEIC (Test of English for International Communication)
Support apprentices in the search for their internship abroad, taking into account the collective aspect of such a project.
To give future engineers an international vision of work, professions and cultures.
Allow apprentices to experience a break with their usual environment.
Make them improve their practical skills of a foreign language.

Course contents

Program:

Review of research progress
Workshops on inter-cultural
Communication and Media Experience (Feature/Documentary)

Internship in a company abroad (9 weeks)
Assessment methods:

pre-training in France (work done during the module), ongoing participation, collective management of the project),
the assessment of the host undertaking abroad,
the production and support of an internship report in the form of a documentary film (supported at the beginning of year 2.

Course material

Assessment

Individual assessment: EVI 1 (coefficient 1)

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

General economy [BTP1_ECOG]

LEAD PROFESSOR(S): Jean-Sebastien LE BRIZAUT

Objectives

To reproduce the main models explaining the functioning of the current economy,
Resituating the stakes of economic agents in the micro and macroeconomic dimensions,
Understanding the interactions between the national, European and global economies,
Understanding the major economic, social and contemporary imbalances,
Develop critical thinking on the major themes of contemporary economy.

Course contents

Part 1. Economic agents and trade

A/ Economy: actors and decisions
B/ Means of exchange: currency
C/ Opening up the economy

Part 2. Wealth Creation and Sustainable Development

A/ Wealth creation
B/ wealth sharing

Part 3. Growth Drivers and Sharing

A/ Growth factors
B/ Sharing growth

Part 4. A Breathless Economic System

A/ Confrontation between neoliberal theory and reality
B/ Organization of international trade in the 20th century
C/ The regionalisation of the world economy
D/ Societal situation: March 2020

Course material

http://sabbar.fr/economie-2/

Assessment

Individual assessment: EVI 1 (coefficient 1)

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

Financial Administration [BTP1_GEFI]

LEAD PROFESSOR(S): Pascal GILQUIN

Objectives

See the fundamentals of corporate finance
Do not confuse result and cash
Validate basic financial vocabulary
Read a balance sheet and an income statement

Course contents

The result of a business
Switching table from one to the other and practical cases
Most important
EBITDA and WCR
Methodology for reading the income statement
Reading methodology Review
3 read tests
Bad word game

Course material

Les 5 clés pour parler FINANCE dunod

Assessment

Individual assessment: EVI 1 (coefficient 1)

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

Management of quality [BTP1_GEQU]

LEAD PROFESSOR(S): Benoit HILLOULIN / Florian MEZIERE

Objectives

Educational Objectives:

At the end of the sessions, each learner:

- knows the basic vocabulary associated with a quality approach

- Understood the main requirements of ISO 9001

- discovered the steps of the problem solving method

Course contents

Applied teaching method:

- Alternation between sequences of theoretical contributions and practical sequences in small groups:

document analysis, information retrieval

- SRB Professional Testimonial

- Sub-group project: preparation and presentation of examples of provisions

ISO 9001 requirements

The quality approach in companies:

What is quality?

What is a quality approach?

What is a SMQ and how to build it?

BTP Company Quality Manual Analysis Exercise

Quality professions in the construction sector

The benefits of a quality approach

Work for the next session: research of information on his company

The ISO 9001 standard and certification:

Presentation
Steps for obtaining ISO 9001 certification

ISO 9001 requirements: the process approach (and the customer/internal supplier relationship)

ISO 9001 requirements by major topic: commercial, design, production/controls

Good practices and pitfalls to avoid

Organization of the project

The ISO 9001 standard and certification (continued):

ISO 9001 requirements by major theme: purchasing, HR, maintenance, document management

ISO 9001 requirements: continuous improvement

Good practices and pitfalls to avoid

Sequence 3 - SRB Professional Intervention

Examples of application of ISO 9001 requirements

Work for the next session

Discovery of the problem solving method:

Return of projects

Knowledge Assessment

Course material

Assessment

Individual assessment: EVI 1 (coefficient 1)

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

Security [BTP1_SECH]

LEAD PROFESSOR(S): Benoit HILLOULIN

Objectives

Proposing a business problem: how such a practice that generates such risks can be improved according to such OTH provisions in the company
Explore the possibilities for improvement of the situation: variation of PMPs, highlighting of the applicable rules, inventory of improvement solutions, Organizational, Technical and Human impact of the choice of solutions.

Course contents

The courses (2h00 to 2h30 per half day) will be divided as follows:
1/ State of play: statistics, costs, general organization of prevention in construction
2/ Analysis of a work situation (decomposition, risk factors, PGP) and risk assessment (Method, tools, management of prevention in the company).
3/ Challenges and choice of solutions: Prevention objectives, criteria for choosing solutions, sustainability of a prevention strategy in the company

Following each part of the course, the students will integrate the knowledge developed into their part of the study in the form of sub-group work.
Courses 4 and 5 will be reserved for the oral presentation of study projects.

Course material

Prévention BTP : www.preventionbtp.fr

Assessment

Individual assessment: EVI 1 (coefficient 1)

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

Technical trades [BTP1_CET]

LEAD PROFESSOR(S): Philippe POULLAIN / Syed Yasir ALAM

Objectives

At the end of this teaching, the learner must be able to:
▪ Cite regulatory instruments governing facility sizing and compliance:
drinking water supply
sewage and stormwater disposal
space ventilation system
▪ Sizing the interior plumbing and ventilation systems of a building
Concepts, concepts worked: hydraulics, aeraulics, open networks, looped networks, laden flows, free surface flows, plumbing, ventilation, pumps and fans.

Course contents

▪ Applied Fluid Mechanics Reminders:
Theorem by Bernoulli
Regular and singular load losses
Pumps and fans
Open and Closed Networks
▪ Water supply
Presentation of DTU 60.11 and other statutory instruments
Network sizing (individual and collective installations, high-rise buildings)
Verification of pressure sizing and sizing of pressure limiting devices
Reading a CCTP (draft)
Checks before receipt (COPREC tests)

Course material

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
French	-	22 hrs	0 hrs	0 hrs	0 hrs	0 hrs

Project owner / Prime contractor [BTP1_MOA]

LEAD PROFESSOR(S): Benjamin TURCAUD / Giulio SCIARRA

Objectives

At the end of this teaching the learner must be able to:
Being in an infrastructure operation,
Know the different stakeholders,
Mastery of basic design tools.

Course contents

1 - Project management - 16 hours
The actors of the act of building (1 h),
The development of an infrastructure operation (2 h),
Definition studies: expression of needs, feasibility, programme (8 h),
M.O.P. Act (2 h),
Environmental constraints: HQE (2h),
Test (1 h).
2 - Project management - 16 hours
Missions of the architect MOE (1 h),
Consideration of the programme (1 h),
Architectural design study (2 h).
Design elements:Requirements: sunlight, lighting, habitability, insertion into the site (shutter landscaping of the P.C.) (4 h).
Constraints: fire safety, adaptability PMR (3 h).
Basic concepts of architecture: history, panorama of current architectural production (2 h),
Summary visit (2 h),
Knowledge Test
Knowledge Check:
Project owner: written knowledge test (1 h). Project owner: written knowledge test (1 h).
Micro memory on experience gained in the field of design.

Course material

Assessment

Individual assessment: EVI 1 (coefficient 1)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
French	-	25 hrs	0 hrs	0 hrs	0 hrs	1 hrs

Building technology [BTP1_PGCO]

LEAD PROFESSOR(S): Jean-Sebastien LE BRIZAUT / Phuong Thao NGUYEN PHAM

Objectives

Objectives:

At the end of the first year, the learner must be able to:

knowledge of the structural systems of foundations, vertical, horizontal and structural structures,
the protection of structures against water,
understand, analyze and verify constructive proposals for a project,
common pathologies.

Course contents

Training Program:

Foundations: constructive systems on soles or piles.
Vertical structures: typology, constructional modes, slender walls and refends.
Horizontal structures: typology, constructional methods of floors and roof terraces.
Protection of structures against water (foundations, walls, drainings).
Common pathologies of the shell (differential settling, vacuum pushing, dilatations).
Case study.

Knowledge Check:

1 evaluation of 2 hours (1 hour without documents and 1 hour with documents).

Course material

Assessment

Individual assessment: EVI 1 (coefficient 1)

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

Formulations and durability of cement-based materials [BTP1_FODUB]

LEAD PROFESSOR(S): Ahmed LOUKILI

Objectives

The aim of the course is to provide the future designer with basic data on the physical, chemical and mechanical properties of materials used in the construction of a sustainable structure

Course contents

- cement Chemistry
- hydration of cement,
- mix-desgn of concrete,
- durability

Course material

A. Neville "Propriétés des bétons " Eyrolles

Assessment

Collective assessment: EVC 1 (coefficient 1)

Individual assessment: EVI 1 (coefficient 2)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
French	-	16 hrs	0 hrs	8 hrs	0 hrs	2 hrs

Mathematics [BTP1_MATH]

LEAD PROFESSOR(S): Jean-Sebastien LE BRIZAUT

Objectives

Acquire the mathematical bases necessary for the training of a future construction engineer

Course contents

Integration and Differential Equations
linear algebra: matrix calculus

Course material

Assessment

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

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
French	-	38 hrs	0 hrs	0 hrs	0 hrs	4 hrs

Physics [BTP1_PHYS]

LEAD PROFESSOR(S): Frédéric GRONDIN / Philippe POULLAIN

Objectives

Knowledge, mastery and application of the basic laws of physics to calculations of technical building equipment and to the study of thermal and thermodynamic systems in buildings and public works.
Concepts, concepts worked: thermal resistance, thermal capacity, sensitive heat and latent heat, heat pump, thermal balances

Course contents

▪ Heat transfer
Building Applications
Public Works Applications
▪ Heat exchange:
Perfect gas law and thermodynamic functions
Thermodynamic transformations and diagrams (Clapeyron, P(h), psychrometric)
A ditherme machine: the heat pump
▪ Heat transfer:
Conduction
Convection
Outreach
Application to heat exchangers (heat pump, dual flow exchanger, radiator)
Permanent flat wall application (building wall)

Course material

Assessment

Collective assessment: EVC 1 (coefficient 1)

Individual assessment: EVI 1 (coefficient 2)

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

Geotechnical engineering [BTP1_GEOT]

LEAD PROFESSOR(S): Mickaël LE VERN / Valérie LACROIX

Objectives

Objectives:

At the end of this teaching the learner must:

Understand and model the physical mechanisms that occur in a soil,
Master the fundamental knowledge allowing the design of geotechnical structures (retaining walls, shallow foundations) in second year of formation.

Course contents

Training Program:

Module 1 MS_ITII_01 Introduction to Geology 4
Module 1 MS_ITII_02 Soil Physical Properties 4
Module 1 MS_ITII_03 Soil Hydraulic Properties. Flow Systems 4
Module 1 MS_ITII_04 Soil compaction 4
Module 1 MS_ITII_05 Module End Control 1 2

Module 2 MS_ITII_06 Mechanical Properties - M.M.C. Recalls - Rheology - Soil Stress. Soil Shear 6
Module 2 MS_ITII_07 Consolidation theory; settlement calculation. 6
Module 2 MS_ITII_08 Module End Control 2 2

Module 3 MS_ITII_09 Practical Work 16

Knowledge Check:

Control #1: Geology ; Physical and hydraulic properties of soils ; Compaction

Control #2: Settlement and shear strength properties of soils

Course material

Briaud, J.L. (2013) Geotechnical Engineering: Saturated and Unsaturated Soils. Wiley

Assessment

Collective assessment: EVC 1 (coefficient 1)

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

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
French	-	30 hrs	0 hrs	16 hrs	0 hrs	4 hrs

Strength of materials [BTP1_RDM]

LEAD PROFESSOR(S): Ahmed LOUKILI / Nordine LEKLOU

Objectives

Objectives:

At the end of this teaching the learner must be able to:

control the calculation of stresses and deformations for an isostatic solid.
control the static of the solid (beam, gantry.),
control the calculation of 1-point stresses of an isostatic solid,
control the calculation of stresses and deformations for an isostatic solid.

Course contents

Training Program:

Definitions and assumptions of the RDM. Solicitations. Solicitations diagrams (M, T).

Definitions of constraints. Research principle of these constraints. Stress tensor in 1 point. Main constraints. Tensor of the deformations.

Mechanical tests (N, T). Elastic characteristics of a material. Strain relations.

Deformation energy. Energy theorems (MAXWELL-BETTI, CASTIGLIANO, MENABREA).

Bending moment. Stresses. Deformed structure (double integration of bending moment, MULLER-BRESLAU theorem). Use of MOHR integrals.

Shear Force. Stress determination by BREDT-LEDUC theory.Thin wall case. Shear centre.

Moment of twisting. Stress and deformation detection in the case of a circular section, an angular point-free section with torsion centre, rectangular section, thin-walled (open and closed) sections.

Knowledge Check:
2 2 hour evaluations.

Training Program:

Static of the solid. Reminders of vector calculation. Bonds. Isostaticity, hyperstaticity. Fundamental principle of the static. Reciprocal actions. Internal, external actions.
Characteristics of a surface. Centre of gravity. Static moment. Moment of inertia. Moment of inertia expressed in a system of axes defined by a translation (HUYGHENS). Moment of inertia expressed in a system of axes defined by a rotation. Main axes of inertia. Polar moment Definitions and assumptions of the RoM. Solicitations. Solicitations diagrams (M,T).
Definitions of constraints. Research principles of these constraints. Stress tensor in 1 point. Main constraints.
Mechanical tests (N,T). Elastic characteristics of a material. Stress-strain relations.
Deformation energy. Energy theorems (MAXWELL-BETTI, CASTIGLIANO, MENABREA).
Bending moment. Stresses. Deformed structure (double integration of bending moment, MULLER-BRESLAU theorem). Use of MOHR integrals.
Shear Force. Stress determination by BREDT-LEDUC theory.Thin wall case. Shear centre.
Moment of twisting. Stress and deformation detection in the case of a circular section, an angular point-free section with

torsion centre, rectangular section, thin-walled sections (open and closed).

Knowledge Check:

Two 2-hour checks.

Course material

Assessment

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

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
French	-	26 hrs	0 hrs	0 hrs	0 hrs	2 hrs

Electricity [BTP1_ELEC]

LEAD PROFESSOR(S): Frédéric GRONDIN / Frédéric POITIERS

Objectives

The objective of the course is to acquire skills in the fields of electrical energy distribution, electrical safety and new and renewable energies. This teaching covers the characterization and measurement of single- and three-phase sinusoidal powers, the prevention of electrical hazards and the protection of property and persons. For the photovoltaic part, the objective is to acquire skills in the fields of wind energy and photovoltaic energy.

Course contents

Course material

[1] G. Séguier / F. Notelet
'Electrotechnique Industrielle', Editions Technique et documentation.

[2] R.P. Bouchard / G. Olivier
'Electrotechnique', Editions de l'école polytechnique de Montréal.

[3] T. Wildi
'Electrotechnique', Presses de l'Université Laval - edition ESKA.

[4] Auber R., Atlanic C. : '""Prévention des accidents électriques"". Les Techniques de l'ingénieur, Génie électrique D 5100 et D 5101, 1996, 39 p.

[5] Picart P. ""Prévenir les risques d'accidents électriques"". dossier de Chantiers BTP n°33, septembre 2001, pp. 51-58

[6] ""De l'électrisation à l'électrocution"". Collection Actualités EHS, Les Éditions d'ergonomie, 1989

[7] ""Effets du courant passant par le corps humain"". Rapport de la Commission électrotechnique internationale, 2e édition, Publication CEI 479-1, 1984

[8] ""Recueil d'instructions générales de sécurité d'ordre électrique"", Publication Union technique de l'électricité UTE C 18-510, juillet 1992

Assessment

Individual assessment: EVI 1 (coefficient 2)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
French	-	18 hrs	0 hrs	0 hrs	0 hrs	0 hrs

Materials [BTP1_MATE]

LEAD PROFESSOR(S): Ahmed LOUKILI / Pascal ROUGERON

Objectives

At the end of the first year, the learner must be able to:
Knowledge of regulations, general terminology, building authorities and bases
essential fire regulations,
know the different materials used in the shell and the second work (manufacturing, uses, products
manufactured, performance and fire resistance),
compositions and use of mortars and concretes.

Course contents

General construction framework, general regulations (REEF, DTU)
General terminologies of the main body of the structure and the second part of the building.
Fire: general, regulation, fire resistance, fire resistance, residential buildings, E.R.P.s, fire
I.G.H., the smoke control.
Materials: Rocks, building stones, ceramic products, plaster, ferrous metals and not
ferrous, wood, glass, plastics, glues (origins, manufacturing, jobs, manufactured goods).
Concretes and mortars: general, compositions, dosages (calculations), uses, formwork and reinforcement.
Knowledge Check:
1 evaluation of 3 hours (1h30 without documents and 1h30 with documents).
1 research work per team of 3 students with presentation of a thesis and oral restitution.

Course material

Assessment

Individual assessment: EVI 1 (coefficient 2)

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
French	-	28 hrs	0 hrs	0 hrs	0 hrs	0 hrs

Continuum Mechanics [BTP1_MMC]

LEAD PROFESSOR(S): Alban LEROYER / Frédéric GRONDIN

Objectives

Structure part :

Fluid part : to master the basics of fluid mechanics

Course contents

Fluid part: general concepts and reminder of Continuum Mechanics, concept of pressure, static, kinematics, concept of viscosity, balance equations, concept of turbulence, Euler and Bernoulli theorems.

Course material

Assessment

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

LANGUAGE OF INSTRUCTION	ECTS CREDITS	LECTURES	TUTORIALS	LAB	PROJECT	EXAM
French	-	24 hrs	0 hrs	0 hrs	0 hrs	4 hrs

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