PEOPLE'S DEMOCRATIC REPUBLIC OF ALGERIA

MINISTRY OF HIGHER EDUCATION AND SCIENTIFIC RESEARCH

Compliance Framework

LMD

ACADEMIC LICENSE

2017 - 2018

Establishment	Faculty / Institute	Department
HBB Chlef University	Faculty of Civil Engineering and Architecture	Architecture

Domain	Sector	Speciality
Architecture, Urban Planning and Urban Professions AUMV	Urban Techniques Management	Urban Engineering

SUMMARY

I – License Identity Card

1 - Location of the formation:

Faculty (or Institute):of Civil Engineering and Architecture
Department : Architecture

2- Formation partners *:

- other university establishments:

Other partner establishments:

DUC--DEP—DL - APC Chlef

- International partners:

External partners

- Other partner establishments:
- Companies and other socio-economic partners:
- International partners:

- companies and other socio-economic partners:

Companies and other socio-economic partners:

CRSTRA — DLEP - DUC

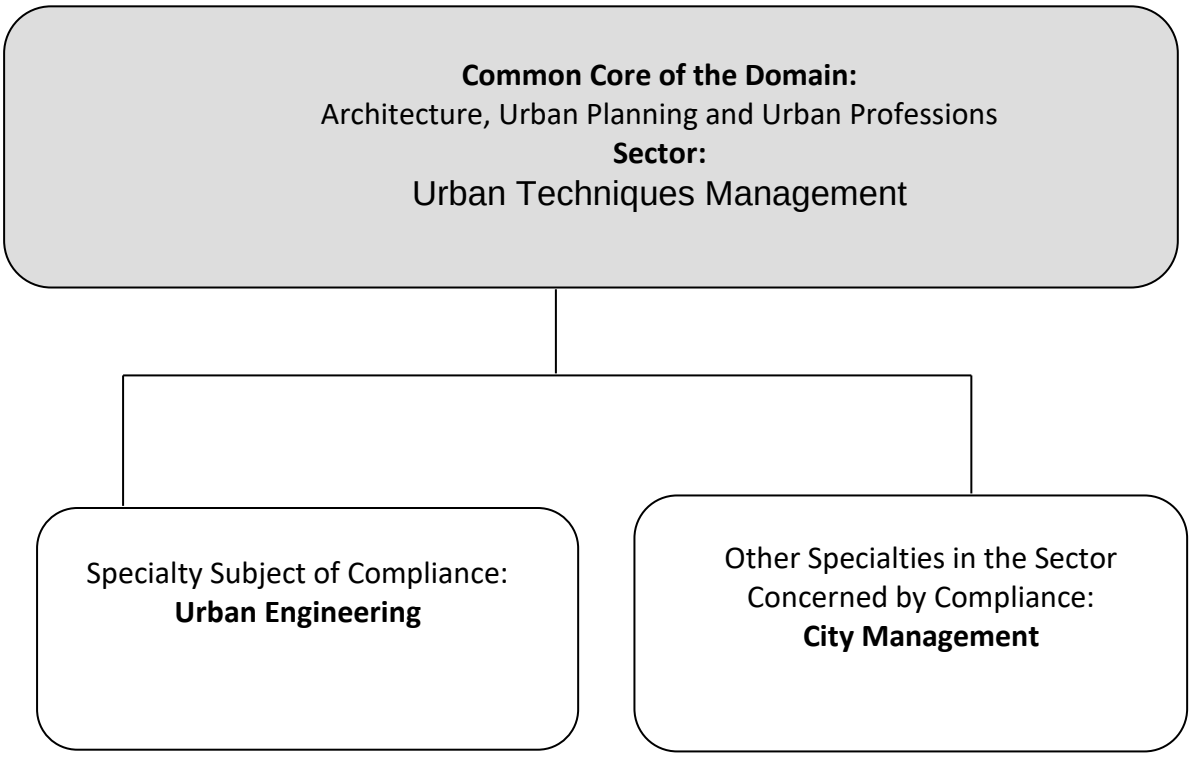
- International partners:

* = Present the conventions in the formation appendix

3– Context and objectives of the formation

A – General organization of the formation : position of the project (Required field)

If several licenses are offered or already supported at the establishment level (same formation team or other formation teams), indicate in the following diagram the position of this project in relation to the other courses.



B - Formation objectives (Mandatory field**)**
(Skills targeted, knowledge acquired at the end of the formation - maximum 20 lines)

The main objective of the Urban Engineering Degree is to train students capable of bringing a multidisciplinary perspective to the multi-faceted challenges of the city.

The urban engineering program offers students an education that allows them to master the technical aspects of their discipline (Urban Engineering) by integrating them into a broader field, that of the urban context, developments and services. The academic courses of the degree are organized around 4 main axes:

- One axis: City management and practices.
- One axis: techniques and sciences for engineers;
- One axis: urban planning and environment;
- One axis: design and construction;

C – Profiles and skills targeted (Required field):

- Through its teachings focused on the four main axes (Management and practices of the city, urban techniques and engineering sciences, urban planning and environment, design and construction and human sciences), the Urban Engineering profile constitutes the main basis of a more in-depth discipline. The one which prepares for integration into the masters of urban sciences, and more particularly in its technical-conceptual and managerial part.

- Graduates in urban engineering will acquire, during their formation, the knowledge and skills that will enable them to participate in the production and management of urban space, through:

- Project management throughout the design, construction and development process in the field of urban engineering within the various private and public sectors.
- They work in the following areas:

- Planning, urban planning and construction;
- Various infrastructures and networks.

- The environment and transport.

D – Regional and national employability potential (Mandatory field)

1- The degree in urban engineering, which welcomes students from the first year (Common Core) in Urban Techniques Management, complements the other formation profiles provided by UTM establishments. It has two main vocations:

1- It prepares the student to pursue higher education; for those who wish to join a master's degree in the urban field.
2- The diversity of teaching provided by the degree allows graduates to accomplish multiple tasks:

- At the level of local authorities and technical administrations: they can carry out urban project management tasks and coordinate between the different stakeholders.
- In design offices: they assist in the development of urban development plans. They carry out surveys and technical field work.
- On site, they monitor construction sites and various networks and coordinate the trades.

E – Gateways to other specialties (Required field)

The student who has obtained the License's degree in GU can continue, subject to certain conditions (average, content of the acquired teaching units, etc.), studies preparing for all existing masters in Urban Technology Management establishments. Other students in the field (AUMV) can apply for the GU master's degree if there is compatibility

F – Expected performance indicators of the formation (Required field)
(Viability criteria, success rate, employability, monitoring of graduates, skills achieved, etc.)

The formation will be viable through the guarantee of employability linked to the evolution of city management processes and the general awareness of the need for such a sector in the practice of governance.

D: Overall summary of human resources mobilized for the specialty (L3):

Academic Rank	Internal Staff	External Staff	Total
Professors	1		
Senior Lecturers (Class A)	1		
Lecturers (Class B)	4		
Assistant Professor (A)	14		
Assistant Professor (B)	3		
Other (*)	1		
Total	**24**	**0**	**24**

(*) Technical and support staff

II – Half-yearly organization sheet for the specialty courses

Semester 1

Teaching Unit	VHS	V.H weekly				Coeff	Credits	Assessment method	
	15 weeks	C	TD	TP	Workshop			Continuous	Examination
Fundamental EU						9	18		
UEF1(O/P)									
Subject 1: Introduction to urban planning 1	45h00	1h30	1h30			2	4	50%	50%
Subject2: Workshop 1: Introduction to technical drawing	90h00				6h00	4	8	100%	
Subject 3: Planning 1	67h30	1h30	3h00			3	6	50%	50%
EU methodology						5	9		
UEM1(O/P)									
Subject 1: Mathematics 1	45h00	1h30	1h30			2	4	50%	50%
Subject2 : Water chemistry	45h00	1h30		1h30		2	4	50%	50%
Subject3: Communication techniques	22h30	1h30				1	1		100%
EU discovery						2	2		
UED1(O/P)									
Subject 1: Urban legislation 1	45h00	1h30	1h30			2	2	50%	50%
EU Transversal						1	1		
UET1(O/P)									
Subject 1: Language 1: English/French	22h30	1h30				1	1		100%
Weekly total		10h30	7h30	1h30	6h00				
Total Semester 1	382h30					17	30		

Semester 2

Teaching Unit	VHS	V.H weekly				Coeff	Credits	Assessment method	
	15 weeks	C	TD	TP	Workshop			Continuous	Examination
Fundamental EU						9	18		
UEF1(O/P)									
Subject 1: Introduction to urban planning 2	45h00	1h30	1h30			2	4	50%	50%
Subject2: Workshop 2: Housing and construction files	90h00				6h00	4	8	100%	
Subject 3: Planning 2	67h30	1h30	3h00			3	6	50%	50%
EU methodology						5	9		
UEM1(O/P)									
Subject 1: Mathematics 2	45h	1h30	1h30			2	4	50%	50%
Subject 2: Building materials	45h	1h30		1h30		2	4	50%	50%
Subject 2: Computing	22h30			1h30		1	1	100%	
EU discovery						2	2		
UED1(O/P)									
Subject 1: Urban legislation 2	45h	1h30	1h30			2	2	50%	50%
EU Transversal						1	1		
UET1(O/P									
Subject 1: Language 2: English/French	22h30	1h30				1	1		100%
Weekly total		9h00	7h30	3h00	6h00				
Total Semester 2	382h30					17	30		

Sector [Urban Techniques Management]
ميدان [السنة الثانية ليسانس معمارية ، عمران ومهن المدينة]
2nd year License's degree: Urban Engineering- Semester 03

Specialty: Urban Engineering

Semester 3:

Course Unit	HVS	HV weekly				Coefficient	Credits	Assessment method	
	14-16 weeks	C	TD	TP	WORKSHOP			Continuous	Exam
FCU1(O/P): Fundamental CU						**09**	**18**		
Module 1: Workshop 3 Diagnosis and urban planning	90 hours				6h00	4	8	100%	
Module 2: VRD1 Urban roads	67h30	1h30		3 hours		3	6	40%	60%
Module 3: RDM	45 hours	1h30	1h30			2	4	40%	60%
MCU1(O/P): Methodological CU						**05**	**09**		
Module 1: Topography 1	45 hours	1h30	1h30			2	4	40%	60%
Module 2: Cartography 1	10h30		1h30			1	1		100%
Module 3: Computer Graphics and IT Tools 1	45 hours			3 hours		2	4		100%
Transversal CU						**01**	**01**		
Module 1: Foreign Language 3 (English/French)	10h30	1h30				1	1		100%
Discoveries CU						**02**	**02**		
Module 1: Soil mechanics 1	45 hours	1h30	1h30			2	2	40%	60%
Total Semester 3	**382h30**	**7h30**	**6h**	**6h**	**6 h**	**17**	**30**		

Sector [Urban Techniques Management]

ميدان [السنة الثانية ليسانس معمارية ، عمران ومهن المدينة]

2nd year License's degree: Urban Engineering- Semester 04

Specialty: Urban Engineering

Semester 4:

Course Unit	HVS	HV weekly				Coefficient	Credits	Assessment method	
	14-16 weeks	C	TD	TP	WORKSHOP			Continuous	Exam
FCU1(O/P): Fundamental CU						**09**	**18**		
Module 1: Workshop 4 Diagnosis of Roadways and Water Networks, and Rehabilitation and/or Urban Planning	90 hours				6h00	4	8	100%	
Module 2: VRD2 Potable water resources	67h30	1h30		3 hours		3	6	40%	60%
Module 3: Environmental Engineering	45 hours	1h30	1h30			2	4	40%	60%
MCU1(O/P): Methodological CU						**05**	**09**		
Module 1: Topography 2	10h30		1h30			1	1	40%	60%
Module 2: Cartography, teledetection and Map Restitution	45 hours			3 hours		2	4		100%
Module 3: Computer Graphics and IT Tools 2	45 hours			3 hours		2	4		100%
Transversal CU						**01**	**01**		
Module 2: Foreign language 4 (French or English)	10h30	1h30				1	1		100%
Discoveries CU						**02**	**02**		
Module 1: Soil mechanics 2	45 hours	1h30	1h30			2	2	40%	60%
Total Semester 4	**382h30**	**6h**	**4h30**	**9h**	**6h**	**17**	**30**		

Sector [Urban Techniques Management]
ميدان [السنة الثانية ليسانس معمارية ، عمران ومهن المدينة]
3rd year License's degree: Urban Engineering- Semester 05

Specialty: Urban Engineering

Semester 5:

Course Unit	HVS	HV weekly				Coefficient	Credits	Assessment method	
	14-16 weeks	C	TD	TP	workshop			Continuous	Exam
FCU1(O/P): Fundamental CU						**09**	**18**		
Module 1: Workshop 5: Socio-economic and environmental analysis	90 hours				6h00	4	8	100%	
Module 2: VRD3: urban hydrology and sanitation.	67h30	1h30		3 hours		3	6	40%	60%
Module 3: Cities and urban traffic	45 hours	1h30	1h30			2	4	40%	60%
MCU1(O/P): Methodological CU						**05**	**09**		
Module 1: Project management	45 hours	1h30	1h30			2	4	40%	60%
Module 2: Research methodology	10h30	1h30				1	1		100%
Module 3: Urban green spaces	45 hours	1h30	1h30			2	4	40%	60%
Transversal CU						**02**	**02**		
Module 3: Construction Technology	45 hours	1h30	1h30			2	2	40%	60%
Discoveries CU						**01**	**01**		
Module 1: Field Visits or Exploratory Internship	05 days (10h30)					1	1	100%	
Total Semester 5	**360h**	**9h**	**6h**	**3 hours**	**6h**	**17**	**30**		

Sector [Urban Techniques Management]

ميدان [السنة الثانية ليسانس معمارية ، عمران ومهن المدينة]

3rd year License's degree: Urban Engineering- Semester 06

Specialty: Urban Engineering

Semester: 06

Course Unit	HVS	HV weekly				Coefficient	Credits	Assessment method	
	14-16 weeks	C	TD	TP	workshop			Continuous	Exam
FCU1(O/P): Graduation Thesis						**09**	**18**		
Module 1: PROJECT WORKSHOP	90H				6h00	9	18	100%	
MCU1(O/P): Methodological CU						**04**	**09**		
Module 1: Geographic Information Systems (GIS) and Decision Support Systems	67h30	1h30		3h00		4	9	40%	60%
TCU1(O/P): Transversal CU						**01**	**01**		
Module 1: Ethics and professional conduct	10h30	1h30				1	1		100%
DCU1(O/P): Discovery CU						**02**	**02**		
Module 1: Public markets	45 hours	1h30	1h30			2	2	40%	60%
Total Semester 6	**225h**	**4h30**	**1h30**	**3 hours**	**6h**	**16**	**30**		

Overall formation summary: (Indicate the total hourly volume, broken down into lectures, tutorials, practicals, etc., over the 4 semesters of instruction—from Semester 3 to Semester 6—by type of Course Unit)

CU / VH	FCU	MCU	DCU	TCU	Total
Course	135h	112h30	67h30	90 hours	405h
Tutorials TD	67h30	112h30	67h30	10h30	270 hours
Practicals TP	135h	180h	-	-	315h
Workshop	360h	-	-	-	360h
Personal Work	852h30	495h	3h	12h30	1375h
Other (specify)	-	-	-	-	-
Total	1550h	900h	150h	125h	**2725h**
Credits	72	36	7	5	**120**
Credit Distribution (%)	60%	30%	5.83%	4.17%	100%
			10%		

III. Detailed program by subject of the semesters

(1 detailed sheet per subject / all fields must be completed)

Semester 3	
Course unit	**Fundamentals CU 3**
Module	**Workshop 03: Diagnosis and urban planning**
Coefficient	**4**
Credit	**8**

Teaching objectives

This teaching is part of a methodological aim: it is about providing students with some tools of urban analysis seen from a spatial angle, necessary for understanding an intervention context (site of implantation, city plan, road layout, etc.), in order to identify and understand its urban and architectural characteristics and to discover its underlying models and structures (dimensions, function, distribution, construction and aesthetic systems)

Recommended prior knowledge

Concepts of building design, the components of urban space: built spaces (any three-dimensional object), unbuilt spaces (developed or not) and network spaces (linear surface, underground, overhead).

Content of the subject:

Theoretical courses:

I. Approaches and methods of urban analysis
II. Urban analysis documents and tools
III. Techniques and means of urban analysis

Workshop:

The content of the workshop exercises must be defined and specified by the teachers

Assessment method: 100% Continuous Assessment

References:to be defined by the teacher

Semester 3	
Course unit	**Fundamentals CU 3**
Module	**VRD 1: Urban roads**
Coefficient	**3**
Credit	**6**

Teaching objectives

Consideration of roads as an infrastructure (technical networks) requiring the implementation of geometric design and calculations.
This subject will allow students to:

- Stages of existing projects;
- Evolution of methods;
- Evolution of the organization;

Evolution of planning principles.

Recommended prior knowledge

- Main characteristics of the urban road team;
- Urban analysis (land use or space consumption, organization, structure and configuration of urban textures, etc.);
- Interaction in Urban Planning and Urban Traffic;

The impact of socio-economic and cultural factors in determining certain spatial forms and structures.

Content of the subject:

Chapter 1: The road network.

1. General information: classification and method of financing urban roads.
    - Traffic;
    - The extent and nature of the area served;
    - The typology.
2. Classification of routes.
3. Elements of urban traffic studies.
    - Traffic analysis;
    - Probable evolution of the various modes of transport;
    - Predictable traffic in urban areas.
4. Earthworks and volume calculations.
    - Soil classification;
    - Calculation of cubic capacities;
    - The execution of earthworks.
5. Geometric characteristics of non-fast urban roads.
    - The demarcation of the land;
    - The land survey and measuring instruments;
    - Identification of existing networks;
    - Altimetric and planimetric connections.

6. The layout of the tracks.
    - Track profiles (longitudinal profiles, cross-sectional profiles);
    - Recommendations for the plan layout;
    - Roadways (composition of roadways, roadway calculation and roadway accessories);
    - Sidewalks and pedestrian walkways;
    - The crossroads;
    - Parking;
    - Special works.

Chapter 2: General earthworks.

1. Definition ;
2. Technical constraints;
3. Economic constraints;
4. The abundance of lands;
5. Land settlements;
6. Slopes and embankments;
7. Volume calculations;
8. Interpretation of the results.

Chapter 3: Public lighting.

- Generalities: outdoor lighting, ambient lighting, lamps;
- Calculation methods and calculation assumptions;
- The calculation of sections;
- Exterior lighting;
- Interior lighting;
- The balance of powers;
- Grounding;
- Electrical equipment.

Chapter 4: The gas network.

- Design and implementation techniques.

Chapter 5: The telephone network.

Design and implementation techniques

Assessment method: 40% in continuous assessment and 60% in exam assessment

References: to be defined by the teachers responsible for the subject.

Semester 3	
Course unit	**Fundamentals CU 3**
Module	**RDM: Resistance of Materials**
Coefficient	**2**
Credit	**4**

Teaching objectives

The main objective of the subject is to enable the student to understand the behavior of the structures that are part of the work. This involves understanding the physical phenomena (forces, balance, constraints, resistances and deformations, etc.) and their impact on design, definition of shapes, dimensions and the choice of materials used.

Recommended prior knowledge

Physics, mathematics and computer science concepts

Content of the subject:

Theoretical courses and tutorials will focus on the following points:

1. Mathematics reminder
   - First and second degree equation with two unknowns
   - Integral calculation
   - Differential equation
   - Trigonometric
2. Introduction to the **Resistance of Materials** 2
   - General definitions
   - RDM objective
   - Problem solving method
   - Reminder of RDM 1:
     - Reminder of essential knowledge
     - Fundamental principle of statics (PFS)
     - Geometric characteristics of plane sections
     - Concept of constraints-solicitations
3. Compound requests
   - Combination of constraints of the same nature
   - Combination of constraints of different natures
4. Triangulated systems
   - Calculation methods for triangulated systems
5. Buckling
   - Stability of a beam in compression
   - Study of some simple cases
6. Hyperstatic beams
   - Resolution methods
   - Continuous straight beams with high static load

Assessment method: 40% in continuous assessment and 60% in exam assessment

References: to be defined by the subject teacher.

Semester 3	
Course unit	**Methodologies CU 3**
Module	**Topography 1**
Coefficient	**2**
Credit	**4**

Teaching objectives

To provide the student with the basic notions of topography and to teach him how to make topographic measurements, intended for the development of topographic plans in the execution of works in the field of urban engineering.

Recommended prior knowledge

Physics, mathematics, computer science, geomorphology and soils.

Content of the subject:

I. Introduction
    1. General notions
    2. Geodesy
    3. Topography
    4. Shape of the Earth
    5. Projection system projections
    6. Geographic coordinates
    7. Orientation (The three Norths)

II. Topography

III. Notion on Faults and Errors.
    1. General information
    2. The mistakes
    3. The Errors
    4. Statistical findings on direct measurements

IV. Distance measurement
    1. Generality
    2. Distance measuring instruments
    3. The staking

V. Flat measurement

VI. Measurement accuracy

VII. Direct measurements

VIII. Indirect length measurement

IX. Measuring angles
X. General information
XI. Units of measurement of angles
XII. The theodolite
XIII. Measurement of horizontal angles
XIV. Measuring vertical angles

Assessment method: 40% in continuous assessment and 60% in exam assessment

References: to be defined by the teachers responsible for the subject.

Semester 3	
Course unit	**Methodologies CU 3**
Module	**Cartography 1**
Coefficient	**1**
Credit	**1**

Teaching objectives

Learn to draw the details found on the surface of the globe that deserve to appear on the map or on the plan drawn up.
Acquire theoretical and technical knowledge on cartography;
To become familiar with graphic expression, to conceive of it as a language which has its laws, its structures and its aesthetics.

Recommended prior knowledge

Mathematics, physics, computer science and topography.

Content of the subject:

1- General introduction: Basic concepts: presentation, evolution of a map, classification of maps, etc.
2- Introduction to cartographic representation: use of cartographic instruments, basics of cartographic expression, summary maps, etc.);
3- Introduction to graphics: the purpose, levels of information, forms of graphic intervention, graphic processing of information, graphic constructions, etc.).

Assessment method: 100% control in exam.

References: to be defined by the teachers responsible for the subject.

Semester 3	
Course unit	**Methodologies CU 3**
Module	**Computer Graphics and IT Tools 1**
Coefficient	**2**
Credit	**4**

Teaching objectives

Teach students to master the basic tools and commands needed to create professional 2D drawings, by learning the essential functions of drawing software.

Recommended prior knowledge

Computer skills

Content of the subject:

1. Visualization:
- "Zoom" commands for viewing the drawing.
- "pan" command.
2. Working with layers:
- Description and advantages of layers.
- Creation and management of layers
- Management of object properties "properties"
3. Dressing:
- Hatching and gradients.
- The rating.
- The text.
- The paintings.
- External references.

Assessment method: 100% control in exam

References: to be defined by the teachers responsible for the subject.

Semester 3	
Course unit	**Transversal CU3**
Module	**Foreign language 3: English / French**
Coefficient	**1**
Credit	**1**

Teaching objectives

- Follow a technical course in English
- Comment on a technical text, write a description
- Understand a scientific article in English.

Recommended prior knowledge

Knowledge acquired during first-year S1 and S2 formation.

Content of the subject:

- Technical English for Construction and Public Works companies
-In-depth work on grammar and vocabulary,
- Common expressions of spoken language
- Oral and written practice using audiovisual means and current press articles
- Manuals, technical sheets and documentation in English

Assessment method: 100% control in exam

References: to be defined by the teachers in charge

Semester 3	
Course unit	**Discoveries CU 3**
Matter	**Soil mechanics 1**
Coefficient	**2**
Credit	**2**

Teaching objectives

To enable students to understand foundation soils, their mechanical and physical properties, and their behavior in different structures, which will enable them to make the best possible choice of technical measures to use during construction or during the rehabilitation of these same structures, taking into account the conditions of use, economy, and safety.
To introduce the student to the data of geology, soil and rock mechanics to understand the essential geotechnical problems encountered in the field of construction.
Teach students about the shapes of the earth and from the tutorials the students must know the different shapes of the sites and their suitability for urbanization and development.

Recommended prior knowledge

Mathematics, physics, materials

Content of the subject:

Chapter I: General geology concepts:
1- Introduction to geology:
2- The Constituents of the Earth
3- Tectonics
4- Organic cycles and the formation of mountain ranges. Algerian examples.

Chapter II: Notions of geomorphology:

1-Structural forms
2-External geodynamics

Chapter III: Soil mechanics:

1-Introduction
2-Physical characteristics of soils
3- Concepts of water in soils and compaction
4-Consolidation, settlement.

Assessment method: 40% continuous monitoring and 60% monitoring during examination

References: to be defined by the teachers responsible for the subject.

Semester 4	
Course unit	**Fundamentals CU 4**
Module	Workshop 4: Diagnosis of Roadways and Water Networks, and Rehabilitation and/or Urban Planning
Coefficient	**4**
Credit	**8**

Teaching objectives

Prepare the student to intervene pragmatically on the city's various roads and networks. This objective is twofold: to plan VRD on Land to be Urbanized (TU) or to be urbanized under condition (TUC), or to intervene on existing networks with a view to rehabilitating or improving them

Recommended prior knowledge

Knowledge of urban planning, the foundations of urban operations, urban forms and their genesis. General knowledge of the urban project and therefore of the interdependencies of the different components of urban space.

Content of the subject:

The workshop is split into two parts: Roads and networks

Roads

Improvement of an urban travel plan on the scale of the urban agglomeration:
1-The state of play of the functioning of the municipality's travel:
Functional approach to the territory, Carrying out a field survey to inform thinking on mobility behavior, Diagnosis of soft links: attendance and usage habits of soft links present in the territory of the municipality.
2-Dysfunctions noted in the routes, the organization of travel and parking:

- Physical, structural, functional, directional, signaling, equipment condition.

3-Plans for planning and managing improvements to urban travel.

- Proposal for an urban transport redevelopment plan.

Potable water and sanitation networks:

- Study of urban planning and updating of data: population, built environment, city expansion.
- Updated plans.

AEP:

- Physical knowledge of the network
  Inventory: the aim of the field analysis is to highlight any operational shortcomings and anomalies, in order to define any possible adjustments to be made to generally improve the supply of potable water and water use.
- Condition of the network and equipment (pipes, shut-off valves, suction cups and drainage).
- Condition of the structures (recovery stations, drilling and reservoirs).
- Network maintenance and monitoring.

Sanitation:

- Physical knowledge of the network
  Inventory: the aim of the field analysis is to highlight the inadequacies and anomalies in the functioning of the network, in order to define any possible improvements to be made to generally improve wastewater disposal outside the urban area and guarantee environmental protection.
- Condition of the network and equipment (pipes, pumping station, galleries, manholes and discharge structures).
- Network maintenance and monitoring (video monitoring devices for pipelines, equipment for monitoring the technical condition of pipelines: hydraulic and gas, pipeline lining technology, etc.)

The purpose of the network diagnosis is to establish a schedule of interventions and update data: different types of interventions (rehabilitation and/or redevelopment) depending on the results obtained and integration and connections of the TU (land to be urbanized).

Assessment method: 100% continuous assessment

References: In addition to the references to be defined by the teachers, the student must be in possession of a methodological collection for carrying out the network diagnosis.

Semester 4	
Course unit	**Fundamentals CU 4**
Module	VRD 2: Urban potable water resources
Coefficient	**3**
Credit	**6**

Teaching objectives

Understanding and mastering the operation of the Potable water supply system in urban areas and the structures for mobilizing water resources.

Recommended prior knowledge

Mathematics, physics, cartography and topography.

Content of the subject:

Chapter 1: Concepts of general hydraulics (flow under pressure).

Chapter 2: AEP systems and main diagrams.

1. Classification of Potable water systems;
2. Water requirement standards and charts;
3. AEP sources and water intake structures;
4. Pumps and pumping stations;
5. Regulation and storage works;
6. Distribution networks and equipment;
7. The particularities of the AEP of industrial zones;

The operation, monitoring and control of the drinking water supply network.

Assessment method: 40% in continuous assessment and 60% in exam assessment

References

- GODART. H, *Adduction et distribution d'eau*, Techniques de l'ingénieur, 2004.
- DUPONT A, *Hydraulique urbaine*, Tome 1&2, Edition EYROLLES, 1979.
- La Lyonnaise des eaux- direction François VALIRON : Mémento du gestionnaire de l'alimentation en eau et de l'assainissement, LAVOISIER, Paris, 1994.

Semester 4	
Course unit	**Fundamentals CU 4**
Module	**Environmental engineering**
Coefficient	**2**
Credit	**4**

Teaching objectives

The course aims to broaden students' knowledge of security measures and urban protection techniques.

The city is considered a vulnerable environment to the effects of nature; the course aims to identify, analyze, and anticipate urban disasters and limit their damage.

So for decision-making support and technical diagnosis, this course allows the student to: identify in the ecological problems of the city, those which challenge urban planners; identify the ecological issues relating to the practice of urban planning; analyze the impacts of eco-development on urban form; establish an impact study; grasp the links between urban planning and the solution of environmental problems, at the scale of municipalities; identify the different approaches and analytical methods relevant to ecology and develop a critical authority in the face of these approaches. Develop an intervention strategy on urban land, taking into account environmental impacts, development laws and pollution problems, ecosystems, human activities and land use, major intervention approaches, development techniques with a view to minimizing impacts on ecosystems, the urban political framework of the Algerian environment and elsewhere, eco-development and energy conservation, techniques for identifying and evaluating environmental impacts, inventory of elements, cumulative impacts, and the environmental assessment process.

Recommended prior knowledge

Urban ecology, chemistry, urban geography

Content of the subject:

Introduction: Disasters in urban history and their effects on the emergence of urban planning, Perception and awareness of risks in industrial societies – lessons learned from recent urban disasters - Uncertainty, prevention principle, precautionary principle, Fire, a controlled urban risk?, Natural risks, their integration into land law, critical analysis of natural risk prevention plans, The nebula of technological risks and the control of urbanization around dangerous installations.

Natural risks: flood, ground movement, earthquake, storm, forest fire, avalanche, tsunami, cyclone and volcanic eruption.

Technological risks: of anthropogenic origin, they include industrial, nuclear and dam rupture risks.

Urban risk: landslide, fire, erosion in urban areas, urban disaster, meteorological vigilance, (gas explosion, toxic material, etc.), disaster for residents,

Risks of transporting dangerous materials: by roads or highways, railways and by pipeline.

Assessment method: 40% in continuous assessment and 60% in exam assessment
References: to be defined by the subject teacher.

Semester 4	
Couse unit	**Methodologies CU 4**
Module	**Topography 2**
Coefficient	**1**
Credit	**1**

Teaching objectives

Assimilate the graphic expression of a terrain and master applications in urban engineering.

Recommended prior knowledge

Physics, mathematics, computer science, geomorphology and soils and topography 1.

Content of the subject:

I-Topographical processes

1. Method of raising
    a. Path calculation
    b. Calculating coordinates
    c. Applications
2. Implantation Method
    a. Calculation of implantations
    b. Implementation of alignments
    c. Implantation of points in planimetry
    d. Implementation of altimetric markers
    e. Radiation implantation
    f. Rectangular coordinate layout

II-Longitudinal and cross-sectional profiles

1. Topographic profiles.
2. Slope map.
3. Application in various networks.

III. Leveling

1. General information
2. Direct leveling
3. Indirect leveling

Assessment method: 40% in continuous assessment and 60% in exam assessment

References: to be defined by the teachers responsible for the subject.

Semester 4	
Course unit	**Methodologies CU 4**
Module	**Cartography, teledetection and Map Restitution**
Coefficient	**2**
Credit	**4**

Teaching objectives

Provide the student with the necessary foundations to produce cartographic documents based on a set of rules;

Acquire the skills to synthesize and present work in several forms (map, photo, statistical processing, analysis, choice of graphic means, cartographic design and layout, etc.).

Recommended prior knowledge

Mathematics, physics, cartography, topography and computer science.

Content of the subject:

Reading cartographic documents and introduction to CAD
1- Definitions and information to be extracted: relief, contour line, cities and human settlements, hydrographic networks, projection system, etc.
2- The aerial photo and maps restored
3- Remote sensing satellite image;
4- Introduction to the automatic card.

Assessment method: 100% control in exam.

References: to be defined by the teachers responsible for the subject.

Semester 4	
Course unit	**Methodologies CU 4**
Module	**Computer Graphics and IT Tools 2**
Coefficient	**2**
Credit	**4**

Teaching objectives

Teach students to master the basic tools and commands needed to create professional 2D drawings, by learning the essential functions of drawing software.

Recommended prior knowledge

Mathematics, Computer Science and Cartography

Content of the subject:

1- Information of a drawing:
- Information about a “list” object.
- Distance between 2 points “distance”.
- Area calculation.

2- The blocks:
- What is a block?
- Creation of a block.
- Inserting a block.

3- Printing and layout: layout and printing by the wizard.

4- Applications of examples in urban engineering.

Assessment method: 100% control in exam

References: to be defined by the teachers responsible for the subject.

Semester 4	
Course unit	**Transversal CU 4**
Module	**Foreign language 4: English / French**
Coefficient	**1**
Credit	**1**

Teaching objectives

Teaching this subject will enable students to:
- Follow a technical course in English or French.
- Comment on a technical text, write a description
- Understand a scientific article in English and/or French.

Recommended prior knowledge

Consolidate linguistic foundations in English or French in communication.
Knowledge acquired during the Bachelor's degree course.

Content of the subject:

- Technical English/French in the field of urban engineering companies.
- In-depth work on grammar and vocabulary.
- Common expressions of spoken language.
- Oral and written practice using audiovisual means and current press articles
- Manuals, technical sheets and documentation in English/French.

Assessment method: 100% Control under review.

References: to be defined by the teachers responsible for the subject.

Semester 4	
Course unit	**Discoveries CU 4**
Module	**Soil mechanics 2**
Coefficient	**2**
Credit	**2**

Teaching objectives

Know the physical characteristics of the soils, their behavior in the different structures, which will allow them to make an optimal choice of technical measures to use during the construction or during the rehabilitation of these same structures, taking into account the conditions of use, economy and safety.

Recommended prior knowledge

Maths, physics, geology, soil mechanics 1

Content of the subject:

1- Retaining walls
2- Superficial foundations
3- Deep Foundations
4- Embankments and dikes
5 - In situ reconnaissance and testing

Assessment method: 40% continuous monitoring and 60% monitoring during examination.

References: to be defined by the teachers responsible for the subject.

Semester 5	
Course unit	**Fundamentals CU 5**
Module	**Workshop 5: Socio-economic and environmental analysis**
Coefficient	**4**
Credit	**8**

Teaching objectives

Prepare students to analyze a given urban space, by incorporating socio-economic and environmental parameters. This course also allows them to acquire the skills necessary for the socio-economic and environmental analysis of a given area.

Recommended prior knowledge

- The principles of graphic representation and cartography;
- Computer tools (spreadsheets and drawing, etc.);
- Notions on spatial practices, the urban environment, etc.

Content of the subject:

After determining the scope of study, the student (or group) must follow the following steps:
- Collection and selection of basic data (cartographic and statistical);
-Updating data;
-Delimitation and identification of the elements of the spatial framework;
-Data processing and development of analysis synthesis;
-The graphic representation.
- Throughout the exercise, the student must take into account several dimensions (spatial, technical, climatic, financial and legal, and socio-cultural, etc.)

Assessment method: 100% Continuous Assessment

- A written report (a specification) accompanying the graph must be presented and displayed. In parallel with the workshop work, thematic presentations (related to the chosen approach) and meetings with local stakeholders on various concrete problems are recommended.

References

- Alberto Zucculli, Introduction a l'Urbanisme Opérationnel et a la Composition Urbaine Volume. 3, OPU, Alger 1984.
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- BLANCHET (Alain), GHIGLIONE (Rodolphe), MASSONAT (Jean), TROGNON (Alain), Les Techniques d'enquête en sciences sociales, observer, interviewer, Paris, Dunod, 1987.
- Panerai, Philippe, Marcelle Demorgon, Jean-Charles Depaule. Analyse urbaine. Marseille, Parenthèses, 1999

Semester 5	
Course unit	**Fundamentals CU 5**
Module	**VRD 3: Urban hydrology and sanitation**
Coefficient	**3**
Credit	**6**

Teaching objectives

This teaching subject being mainly devoted to:

- The acquisition of tools and methods for calculating various roads and networks (VRD) through exercises and mini-projects.
- Understanding and mastering the operation of the sanitation system in urban areas and wastewater disposal facilities.

Recommended prior knowledge

Mathematics, Physics and Topography.

Content of the subject:

Urban hydrology:

- Water balances in the atmosphere
- Rainfall observations
- Means of precipitation assessment (rainfall measurement and exploitation networks)
- Flow measurement
- Measurement of pollutant flows

Urban sanitation:

- Concepts of general hydraulics (free surface flows)
- Urban sanitation systems (wastewater disposal standards and irregularity coefficient)
- Sanitation networks (layout of collectors and networks, design parameters of a sanitation network)
- Concepts of hydraulic calculation of the pipeline network and network structures
- Types of network pipes
- Works on the sanitation network
- Rainwater drainage network
- Wastewater and sediment removal
- Operation, monitoring and control of the sanitation network

Assessment method: 40% in continuous assessment and 60% in exam assessment

References: to be defined by the teachers in charge.

Semester 5	
Course unit	**Fundamentals CU 5**
Module	**City and urban traffic**
Coefficient	**2**
Credit	**4**

Teaching objectives

Acquire knowledge and concepts relating to mobility issues.
Understanding the interactions between transport systems, the evolution of urban traffic and its importance in the city while integrating it into the sustainability strategy.

Recommended prior knowledge

- Generalities in urban planning
- Types and classification of roads
- Types of transport, modes and infrastructure
- Topography concepts

Content of the subject:

The content of this subject is presented in three axes:

1. General information on urban traffic
   - Definitions
   - Traffic issues in the city
2. Urban roads and city organization
   - The functions of roads; economic and social
   - Technical characteristics and classification
   - Urban forms and traffic networks
3. Principles of infrastructure organization
   - Development and design of roads, equipment and infrastructure necessary for traffic
   - Case study (examples realized)
4. Prospective studies
   - Study of some specific urban traffic projects.
   - Creation of a transport and traffic plan

Assessment method: 40% in continuous assessment and 60% in exam assessment

References: To be defined by the teacher

Semester 5	
Course unit	**Methodologies CU 5**
Module	**Project management**
Coefficient	**2**
Credit	**4**

Teaching objectives

The content of this module aims to introduce the student to the techniques of managing development projects and the processes of project management.

Recommended prior knowledge

Good knowledge of urban organization and planning.

Content of the subject:

Introduction:
1: Projects: why and how?
2: Location and typology of projects in companies
3: Organize projects - design approaches
4: Study of the cases of the automobile and civil engineering
5: What structure is needed to make a project work?
– Assessment and advice
6: Set objectives, identify stakeholders
7: Lead meetings
8: Write the report
9: Work organization
10: The tunnel effect and the project cycle
11: Project evaluation
12: The profitability of projects
13: Project team management
14: The Strategic analysis in project management
15: The profitability of projects

Assessment method: 40% continuous monitoring and 60% monitoring during examination.

References: to be defined by the teachers in charge.

Semester 5	
Course unit	**Methodologies UC 5**
Module	**Research methodology**
Coefficient	**1**
Credit	**1**

Teaching objectives

Research methods and processes leading to the formulation of problems, assuming hypotheses, structuring and writing a final year dissertation, data collection and analysis techniques (field survey), and learning the use of data analysis software (SPSS and MODALISA, etc.).

Recommended prior knowledge

The student must have acquired good knowledge of IT

Content of the subject:

The student is expected to prepare a project within the research team. This project sets out the theme of the dissertation, the problem, the documentary survey, the theoretical framework and the research methodology. The project formulated by the student concerns the relevance of the choice of the subject based on a question relating to fundamental aspects of the urban project in terms of forms, scales and actors.
During the fourth semester, support meetings took place periodically between students and teachers for the completion of the research paper, after the acquisition of the following courses:

1-Scientific Approaches

- qualitative
- quantitative
- 1.2- Typical methods:
- experimental methods;
- survey methods
- Historical methods…..

2- Research techniques and means

- sampling:
- scientific observation;
- the questionnaire;
- the interview
- experimentation;
- The comparison…….
- Examples (concrete cases).

3 - Written communications (administrative writing)

- The forms that written communications take:
  - the report;
  - the minutes;
  - the report;

- the letter;
- The note.
- The print.

- Application exercises for each form.

4 - Dissertation and internship report

-The choice of a research theme

- The problem;
- Working hypotheses
- data collection and use of different techniques;
- Analysis and interpretation: (data preparation, formatting, transfer, etc.);
- The final writing and formatting of the dissertation.

-the characteristics of the writing of the thesis (or report):

- the development of a plan;
- the choice of style
- objectivity;
- simplicity;
- clarity;
- Precision.

5- The Graduation project (PF E)

-the stages of developing a gradation project (PF E):
-the definition of the problem;
- Data collection and use of different techniques;
-analysis and interpretation: (preparation of data, their formatting, their transfer, etc.)
-the final presentation:

- the design of the project;
- the drafting of specifications

Assessment method: 100% control in exam.

References: to be defined by the teachers in charge.

Semester 5	
Course unit	**Methodologies CU 5**
Module	**Urban green spaces.**
Coefficient	**2**
Credit	**4**

Teaching objectives

-Benefit from knowledge about green spaces and their impact on the environment, particularly urban;
-Understand the different parameters necessary for the development, design and creation of green spaces;
-Analyze and diagnose the state of green spaces in urban environments;
-Define the needs of urban populations in terms of green spaces.

Recommended prior knowledge

Materials, soil mechanics, environmental engineering, topography and cartography.

Content of the subject:

The courses in this subject are structured around the following axes:
-Introduction.
-Definitions and concepts.
-Historical approach to green spaces.
-The functions of green spaces.
*the different roles of green spaces.
*the functions of trees and green spaces:
-Typology of green spaces:
-Green space standards:
-Plant biology.
-Design and development of urban green spaces.
-Management of urban green spaces.

Assessment method: 40% continuous monitoring and 60% monitoring during examination.

References: to be defined by the teachers in charge.

Semester 5	
Course unit	**Transversal CU 5**
Module	**Construction technology**
Coefficient	**2**
Credit	**2**

Teaching objectives

Develop and deepen knowledge in specialized sectors (technology and construction). Students will work in the areas of project management, structural work, buildings, and all construction work.

Recommended prior knowledge

Maths, physics, technical drawing, materials, soil mechanics, RDM, topography and cartography.

Content of the subject:

1. Basic provisions of the construction industry
   - Basic concepts
   - Construction process technology
   - Application of technical means, efficient materials, components and structures
2. Construction design
   - Preparation of technological maps
   - Design variant
3. Preparatory work
   - Geotechnical surveys, topography
   - Preparation of the site
   - Earthworks
4. Construction materials
   - Aggregates, lightweight aggregates (production, use)
   - Local historical material, a renewable resource
   -Standards, Cleanliness
   - Reuse of concrete
   - Wooden structures and products
5. Transportation of construction materials and accessories
   - Rail transport, road transport
   - Loading, unloading and storage of materials
6- Construction technology of works and structures
   - Assembly of prefabricated structures
   - Construction of reinforced concrete structures
   - Construction of stone buildings

Assessment method: 40% continuous monitoring and 60% monitoring during examination.
References: to be defined by the teacher in charge.

Semester 5	
Course unit	**Discoveries UC 5**
Module	**Field Visits or Exploratory Internship**
Coefficient	**1**
Credit	**1**

Teaching objectives

The urban engineering sector is a specialty that is understood and practiced in the field. This is why the city represents a case study of exemplary specificity in terms of urban projects, as well as in terms of urban planning and architecture.
The student has the opportunity to see and analyze the functioning and management of a city through all components of the urban system in a real space.

Recommended prior knowledge

Maths, physics, technical drawing, materials, soil mechanics, RDM, topography, cartography, planning, urban planning and networks.

Content of the subject:

1- Check the condition of the premises:
- Topography.
- Road structure.
- Networks
- Servitude.
- Urban fabric: composition and typo-morphology
- Peri-urbanization.

2. Descriptive analysis of major projects and the environment (bridges, water tower, power station and wastewater treatment plant and tramway).
3. Visit of major equipment, their installations and their operations.

Assessment method: 100% Continuous assessment

References: to be defined by the teacher in charge.

Semester 6	
Course unit	**Fundamental UC 6**
Module	**Workshop 06: Graduation thesis**
Coefficient	**9**
Credit	**18**

Teaching objectives

Highlight the theoretical and practical knowledge acquired during the license's degree formation, but also, to have a spirit of analysis, synthesis and group work and to communicate with partners.

Recommended prior knowledge

Urban techniques and urban project;

Content of the subject:

Preparation of a final project:

a) Either, the elaboration of a planning, design and calculation project (integrating VRD), in the case of an urban space.
b) Or, the study of a concrete urban problem, in the case of a developed or built site. The example of a regulatory and operational urban planning operation (urban improvement, rehabilitation, restructuring, etc.), in this case focusing on networks and urban techniques.

Assessment method: 100% continuous monitoring.
Validation is carried out on the basis of continuous assessment and the presentation of a final project (graphic and written report).

References: To be defined by the teachers, according to the project proposed for the study.

Semester 6	
Course unit	**Methodologies UC 6**
Module	**Geographic Information Systems (GIS) and Decision Support Systems**
Coefficient	**4**
Credit	**9**

Teaching objectives

The objective of this subject is to acquire basic knowledge of the software and the elementary notions of geomatics and Decision Support tools used to facilitate access, querying and analysis of an organization's information for its decision-makers; to become familiar with the functions of the interface as well as with the fundamental concepts specific to geographically referenced data. At the end of this formation, students will have the necessary knowledge to use the different software independently in areas directly related to their disciplinary fields.

Recommended prior knowledge

Maths, physics, topography, cartography, remote sensing, IT, CAD.

Content of the subject:

1-Generality and basic concepts

- Introduction to Databases
- General information about Access and Excel software
- Other types of databases (mySQL and others…….)

2-Introduction to geographic information systems (GIS)

- Introduction
- Reminders on geographic projection systems
- Reminders about cartography
- ArcGIS Product Overview
- Creating a database with Arcatalog
- Data types: raster and vector
- Creating new layers
- Georeferencing raster images
- Editing layers or digitizing
- Attribute tables and their relationships with geographic entities
- The restitution and layout of the maps (scales, grid and legend, etc.)

Assessment method: 40% continuous monitoring and 60% monitoring during examination.

References: To be defined by the teachers in charge,

Semester 6	
Course unit	**Transversal UC 6**
Module	**Ethics and professional conduct**
Coefficient	**1**
Credit	**1**

Teaching objectives

To become familiar with the set of principles and ethical rules that govern and guide all activities, and define the duties required of professionals in the performance of their work.

Recommended prior knowledge

The statutes and regulations of higher education which govern the university.

Content of the subject:

1- Definitions:
- Professional ethics
- Ethics.
- **Values**
- Homework
- Profession, etc.

2- Rules, code of ethics and
- Vision and applicability
- Responsibility
- Respect
- Equity
- honesty

3-Professional conduct

4- Examples of code of ethics.

5-Protection of personal data and new information and communication technologies
a. Research Data Security
b. Ethical aspects of data sharing in science

6-The research profession with regard to ethics and societal issues:
c. Scientific integrity, fraud and ethics
d. Ethics of research policy
e. Ethical vigilance of researchers
f. research ethics and ethics of participation in research

7-Main standards regarding the ethics of research with human subjects

Assessment method: 100% Control under review.

References: To be defined by teachers in charge.

Semester 6	
Course unit	**Discoveries UC 6**
Module	**Public markets**
Coefficient	**2**
Credit	**2**

Teaching objectives

Teach the student to apply the laws and regulations in force when choosing a partner to carry out an intervention in an urban area.

Recommended prior knowledge

Planning, urban planning regulations, networks.

Content of the subject:

1- Notebook his charges.
2- The partners:
- The public operator (contracting authority, person responsible for the contract, etc.)
- The entrepreneur (Business groups)
- Other stakeholders (project managers, subcontractors, etc.)

3- PURPOSE AND PRICE OF THE CONTRACTS:
- Market categories
- Nature and content of the prizes
- Settlement prices

4- the selection procedures:
- Selection modes
- Advertising rules

5- the particular forms of walking:
- The market has ordered
- The market has a conditional tranche

6- the contractual documents:
- The constituent parts
- Subsequent documents (amendments, etc.)
- The order of service

7- the guarantees:
- The deposit
- the retention money
- the terms of restitution or release

8- payment terms:
- the determination of quantities
- the monthly statement. the deposits and advances
- the final count and the general count

9- Changes in progress:

- new prices
- variation in mass
- Change in the importance of the various types of works

10-deadlines and reception:

- Deadlines, penalties and bonuses
- Acceptance of works
- Warranty period

11-Termination:

- The different cases of termination.

Assessment method: 40% Continuous monitoring and 60% Exam monitoring.

References: To be defined by the teachers in charge.