Université Gustave Eiffel

EIVP
ÉCOLE DES INGÉNIEURS DE LA VILLE DE PARIS
ÉCOLE SUPÉRIEURE DU GÉNIE URBAIN

Urban Engineer Diploma Programme

Université Gustave Eiffel

1st year
Semester 5

EIVP

COURSE NAME	HOURS	ECTS
S5 - Urban planning and management	28,5h	2

“Inaugural back-to-school” conferences

The course "Inaugural Back-to-School Conferences" allows engineering students to understand the important stages in the construction of cities, using Paris as an example. Additionally, it enables them to grasp the challenges that cities are facing today.

Urban Forms and Society

The course provides an introduction to the understanding and comprehension of urban forms, the history of urban planning, and their evolution in parallel with the societies in which they are situated.
After a historical section, the course focuses on the major functions of the city : Exchange, Production, Living, and a more transversal theme dedicated to the repair/resilience of the city.
Sessions involve various professionals discussing these urban functions, and also encourage student participation through role-playing or organized debates during the sessions.
Assessment is carried out in the form of a documentary film lasting 5 to 10 minutes.

COURSE NAME	HOURS	ECTS
S5 - Sustainable construction	72h	6

Construction materials and processes

The course begins with a general introduction to the usual vocabulary of construction and building: types of structures, elements of structures, functioning of structures, and loads.
Following this, presentations are given for each material: masonry, concrete, metals, wood, and bio-based materials, covering their history, production methods, properties, specific terminologies, construction principles, implementation methods, regulations, calculations, common pathologies, environmental footprints, and life cycles.

Materials resistance

The Mechanics of Materials (MoM) is one of the essential disciplines for engineers and architects. It is a prerequisite for the analyses and justifications necessary for the study of structures such as buildings, bridges, tunnels, etc.
The MoM is introduced here through the usual concepts of physics and aims to provide the student with a foundation to pursue specialized coursework in reinforced concrete, timber construction, metallic construction, and more. The targeted outcomes relate to the physical understanding of static equilibrium phenomena and the constituent materials, all within a context of "design office" simulation.

Structural studies

The Structural Analysis course allows for the calculation of the various forces acting on a structural element and the realization of a load distribution on these elements. This involves understanding the forces that act on a structure, as well as the ability to determine how these forces are distributed and supported by the different elements.

COURSE NAME	HOURS	ECTS
S5 - City metabolism	72h	7

Environment Energy Climate Project

The "Environment Energy Climate Project" allows engineering students to familiarize themselves with project-based learning on a topic related to the environment or energy. In groups of 4 to 5, students will need to develop a problem statement based on a situational analysis and a mapping of the study site. They will then implement a research methodology and justify their approach. Finally, they will analyze the results obtained and present their work both in writing and orally.

“Urban Ecology and Resilient City” conferences

The course "Urban Ecology and Resilient City" enables engineering students to characterize phenomena related to climate and ecosystem changes, as well as the natural or technological risks that territories must face. Students are able to justify actions at different scales to make urban systems more resilient.

City and Energy

The course "City and Energy" enables engineering students to understand the global context of energy production, transportation, distribution, and consumption. It also helps them become aware of energy challenges faced by cities and to integrate these concerns into construction and urban development projects.

COURSE NAME	HOURS	ECTS
S5 - Mobility and transportation	18h	2

Challenges of Transportation and Urban Mobility

The course "Challenges of Transportation and Urban Mobility" introduces students to the fundamental aspects of developing and implementing a sustainable urban mobility policy, providing a dual perspective from both French and international contexts. The course particularly addresses the key challenges of sustainable urban mobility policies, the governance of these issues (stakeholder dynamics), and the modes of action. It covers both the mobility of people and goods. The design of transportation projects is also discussed within the framework of this module.

COURSE NAME	HOURS	ECTS
S5 - Digital and applied mathematics	72h	5

Applied Probability and Statistics

The course "Applied Probability and Statistics" enables students to present data effectively and reliably, to acquire the basics of estimation theory (point and interval estimates) in order to have a reliable understanding of unknown parameters, and to test hypotheses based on data. Refreshers and in-depth discussions on probability theory are provided, which are essential for establishing a solid foundation in inferential statistics.

Algorithms and Python programming

The course "Algorithms and Python Programming" enables engineering students to solve a numerical computation problem by designing an algorithm, analyzing and evaluating the complexity of an algorithm, converting an algorithm into Python code, executing it with input data, displaying the results, and interpreting them.

GIS - Geographic Information System

The GIS course will enable the engineering student to overlay datasets to diagnose a specific area, manipulate geo-numeric data using a GIS tool by reading metadata and attributes, performing table and layer joins, and calculating fields, as well as designing maps that display relevant information about a specific area.

CAD - Computer-Aided Design

At the end of the CAD course, the engineering student is able to identify the information from a reference plan, draw a zoning plan based on an existing plan, and take measurements and create a section from the same existing plan.

COURSE NAME	HOURS	ECTS
S5 - Human and Social Sciences	66h	6

Immersion and Foresight in Urban Engineering
The course "Immersion and Foresight in Urban Engineering" aims to train students in user-centered design by covering all the essential steps of such an approach: studying the target audience through personas, identifying pain points, researching solutions, collecting feedback, analyzing the business model, and pitching in front of a jury.

Theory of Organizations
The course "Theory of Organizations" addresses the theoretical foundations of management applied within a framework context, highlighting the theory of work organization, organizational sociology, and the role of the manager within the organization. It also covers the definition of teamwork, the various roles and interactions within the team, as well as the preparation and conduct of a meeting. The course examines interactions within the structure by focusing on mental representations and analyzing interactions. Finally, it discusses values, motivation, and the meaning of work.

Written Communication
The course "Written Communication" aims to teach the fundamentals and stakes of communication. The instruction is focused on identifying and producing various written communication materials (such as summaries, reports, scientific posters, etc.) that engineers need to know and master. The methodological aspects necessary for their production are studied.

Health and Safety at Work
The course "Health and Safety at Work" highlights the human, socio-economic, and legal issues related to the prevention of occupational risks. It covers the functioning of the prevention approach and the nine general principles of prevention. It also addresses the various stakeholders and their roles in the prevention of occupational risks, as well as risk assessment methods.

CV, Cover letter, Interview preparation
This course prepares engineering students for their internship search by providing them with the keys to writing a professional CV and a well-structured, persuasive cover letter. It also offers guidance on how to succeed in an interview.

COURSE NAME	HOURS	ECTS
S5 - International opening	36h	2

English 1: acquisition of B2 level

The English course enables engineering students to achieve a B2 level in English, meaning they are capable of understanding complex lectures or speeches, answering questions about articles with differing viewpoints, participating in conversations with native speakers, expressing themselves in detail on various topics, and writing clear texts about their interests or well-argued reports.

Living language 2: Spanish, Italian, German, Portuguese, Mandarin

The living language course should enable engineering students to present topics related to urban engineering fluently in German, Spanish, Italian, Mandarin, or Portuguese, to create technical summaries in these languages, to conduct professional discussions and negotiations, to participate in job interviews, and to write persuasive CVs and cover letters in these languages. Additionally, they should be able to conduct bibliographic research in scientific databases and write critical research reviews in the chosen language.

COURSE NAME	DURATION
S5 - Worker internship	3 weeks

The worker internship is an immersion into the corporate world, aimed at discovering and understanding the multiple aspects of an organization's structure and functioning, as well as grasping the constraints and resources of the teams that the engineering student may be called upon to lead and manage in their professional career. During this internship, the engineering student must be integrated into a team of workers, understand the daily tasks of the workers, and analyze teamwork and communication methods between different hierarchical levels.

Université Gustave Eiffel

1st year
Semester 6

EIVP

COURSE NAME	HOURS	ECTS
S6 - Urban planning and management	36h	2

Legal Environment of Projects

The course "Legal Environment of Projects" is designed to identify the main legal issues that may arise during the management of projects in urban settings. The objective is to ensure the legal security of the files to avoid challenges and claims that could lead to time loss.

Construction site techniques

The course "Construction Techniques" enables engineering students to understand the roles and relationships of various stakeholders on a construction site. They also learn to describe the scheduling of a site, the steps involved, and the constraints in carrying out construction projects. Finally, the student is able to develop a phasing plan based on a simple case, such as the re-calibration of a roadway.

COURSE NAME	HOURS	ECTS
S6 - Sustainable construction	72h	7

Reinforced Concrete Structures

The course on "Reinforced Concrete Structures" enables the engineering student to understand the functional principles of reinforced concrete and identify its main properties. It also allows the student to size common elements of a reinforced concrete structure (beam, column, slab, foundation) according to loading actions and regulatory context (Eurocode 2). Finally, the student is capable of verifying the consistency of the dimensional data and design assumptions in relation to the applicable regulations.

Metal Construction

The course "Metal Construction" based on Eurocode 3 begins with a general introduction to the use of steels in civil and industrial construction, addressing their mechanical properties, advantages, and disadvantages. It then covers the basic concepts and safety considerations, including characteristic values of actions, regulations, safety verification principles, loads, and action combinations. Finally, it discusses the calculation (dimensioning/verifying) of components subjected to various forces such as compression, tension, pure bending, shear, as well as combined stresses. At the end of each chapter, practical applications are provided.

Wood Structure

The objective of the "Wood Structure" course is to enable students to design a structure or a simple part of a structure in wood. The teaching follows a pathway that begins with resources and the wood industry, then covers the characteristics of the material and its durability, construction systems, the sizing of structures and joints, the stability of works, and the approach to fire situations.

COURSE NAME	HOURS	ECTS
S6 - City Metabolism	15h	1

Crisis Management and Resilience

The course "Crisis Management and Resilience" enables engineering students to recommend action plans to address crisis situations by identifying the hazards and risks in a study area or network, mobilizing the necessary stakeholders in case of a crisis, and defining the priority actions to be implemented. Additionally, the student is capable of evaluating, designing, and managing urban projects using resilience concepts, conducting risk analyses, and proposing technical solutions to reduce risks while considering social and environmental issues.

COURSE NAME	HOURS	ECTS
S6 - Numerics and applied mathematics (1/2)	108h	8

DATA Project

The "DATA Project" enables the development of teamwork and addresses data management on a topic related to urban planning. By the end of the project, students are able to design a data processing pipeline for a given problem, justifying each step. In addition, they are capable of interpreting, justifying, and visualizing the results of the data analysis process.

Dataviz : urban data visualization

The course "Dataviz" focuses on communicating an idea or facilitating the understanding of a phenomenon by analyzing data. In this course, we explore the opportunities offered by visualization and the principles that help us use it optimally based on the desired objective and the target audience. Through practical work, we will master Python libraries that allow us to create conventional, geographic, or interactive visualizations. Thus, in connection with the data project, we learn the elements of the complete data analysis chain.

Operations Research and Optimization

The course "Operations Research and Optimization" enables engineering students to apply linear programming methods to solve problems related to planning and transportation. The student will be capable of modeling and formalizing network optimization, planning, and transportation problems. Finally, they will be able to use Python and Jupyter Notebook to address management or optimization problems in the fields of networks, planning, and transportation.

COURSE NAME	HOURS	ECTS
S6 - Numerics and applied mathematics (2/2)	108h	8

CAO 2 - Computer-Aided Design 2
At the end of the CAO course, the engineering student is able to identify information from a reference plan, create a zoning plan based on an existing plan, and carry out measurements and a section from that same existing plan.

New Technologies in the City
The course "New Technologies in the City" enables engineering students to explain the fundamental concepts of telecommunications networks and their importance in the digital development of territories, to study the environmental challenges related to these developments, to explain how surveillance systems, sensors, and IoT devices can be used to collect data and manage urban infrastructures, and to examine the ethical issues associated with the use of these systems.

COURSE NAME	HOURS	ECTS
S6 - Human and Social Sciences (1/2)	84h	5

Organizational Behavior

The course "Organizational Behavior" enables engineering students to justify the choice of methodology selected to address a given problem, propose recommendations to enhance team dynamics within organizations, and analyze the fundamental principles of organizational psychology.

Oral and Interpersonal Communication

The course "Oral and Interpersonal Communication" enables engineering students to communicate clearly, persuasively, and professionally in various contexts, effectively structure presentations, adapt their speeches according to the audience, prepare and facilitate debates on urban issues, analyze interpersonal dynamics, and formulate relevant recommendations for oral communication to solve problems.

Introduction to Law

The course "Introduction to Law" enables engineering students to understand the importance of law in society, identify the implications of law in the protection of fundamental rights, and master legal methodology. It also allows students to explain the organization and functioning of justice, distinguish fundamental legal concepts, and explain the main branches of law and their interrelation.

COURSE NAME	HOURS	ECTS
S6 - Human and Social Sciences (2/2)	84h	5

Public Procurement and Actor Dynamics 1
The course "Public Procurement and Actor Dynamics 1" enables engineering students to recognize the various stages of a good's life cycle (from the expression of needs to deconstruction), identify the roles of the different stakeholders involved in a construction project (client, project manager, control office, health and safety coordinator, project management assistant, companies, suppliers, etc.), and choose the most suitable consultation and contracting processes based on the usage conditions and characteristics of the projects.

Labor Law and Human Resources Management
The course "Labor Law and Human Resources Management" enables engineering students to understand social life within a company and to identify the sources of labor law, to master workforce and skills management in the company, to comprehend sanctions, disputes, and termination of employment contracts, as well as to understand the legal framework of remuneration and dispute management.

COURSE NAME	HOURS	ECTS
S6 - International opening	36h	2

English 1: acquisition of B2 level

The English course enables engineering students to achieve a B2 level in English, meaning they are capable of understanding complex lectures or speeches, answering questions about articles with differing viewpoints, participating in conversations with native speakers, expressing themselves in detail on various topics, and writing clear texts about their interests or well-argued reports.

Living language 2: Spanish, Italian, German, Portuguese, Mandarin
The living language course should enable engineering students to present topics related to urban engineering fluently in German, Spanish, Italian, Mandarin, or Portuguese, to create technical summaries in these languages, to conduct professional discussions and negotiations, to participate in job interviews, and to write persuasive CVs and cover letters in these languages. Additionally, they should be able to conduct bibliographic research in scientific databases and write critical research reviews in the chosen language.

COURSE NAME	DURATION
S6 - Supervisory internship	8 weeks

The supervisory internship is an introduction to management, aiming to carry out team management tasks in the field of urban engineering (work organization, monitoring task execution, supporting technical personnel in their missions) and to engage in personal reflection on a topic related to management (factors of motivation, responsibilities of a manager, ways to overcome conflicts, etc.) based on lived or observed situations and conducting interviews.

Université Gustave Eiffel

2nd year
Semester 7

EIVP

COURSE NAME	HOURS	ECTS
S7- Urban planning and management	18h	1

Management of Public Space and Heritage

The course "Management of Public Space and Heritage" enables engineering students to formulate hypotheses about the uses and urban identity of a public space based on photographs and location plans. Additionally, it allows them to identify the programmatic issues of a specific public space and to explain the roles of key stakeholders in the planning of an intervention in that space.

COURSE NAME	HOURS	ECTS
S7- Sustainable construction (1/2)	156h	17

Principles of architectural design

The "Thermal and Acoustic" course is organized around a dual objective:
·To study the parameters and physical phenomena that underlie the notions of thermal and acoustic comfort in order to design comfortable buildings.
To understand and estimate the energy consumption associated with comfort thresholds in order to minimize them.

Sustainable Construction Project

The "Sustainable Construction Project" allows engineering students to work in groups on a rehabilitation project. After conducting a site analysis, the student must propose a built solution that responds to the complementary program developed and the site analysis performed. At the end of the project, the student must report on their teamwork in a professional context, both orally and in writing, by providing a general presentation of the project that explains the architectural decisions (building orientation, height, volume, room organization), as well as the technical choices made (structure, envelope, materials, fire safety for ERP, accessibility for people with reduced mobility).

Geotechnics and foundations

Geotechnics encompasses all the construction sciences that interact with soil. This course aims to provide students with a set of knowledge and skills that will allow them to understand the role of the geotechnical engineer in a project. The course covers: the fundamentals of soil identification, soil behavior, and more generally, the concept of geotechnical modeling; the design principles for foundations, both shallow and deep; and the rules for checking the stability of slopes and designing retaining structures.

COURSE NAME	HOURS	ECTS
S7- Sustainable construction (2/2)	156h	17

Thermal and Acoustic

The "Thermal and Acoustic" course is organized around a dual objective:

- To study the parameters and physical phenomena that underlie the notions of thermal and acoustic comfort in order to design comfortable buildings.
- To understand and estimate the energy consumption associated with comfort thresholds in order to minimize them.

Building Life Cycle

In the course "Building Life Cycle," the life of the building is studied from the extraction of the raw materials necessary for its construction to its end of life, with a focus on circular economy. This course covers the management of environmental impacts and their calculation methods, the implementation of an energy sobriety policy during operation, as well as the design of reversible buildings that allow for the reuse of materials at the end of their life.

Construction Economics

The course "Construction Economics" enables students to identify the applications of construction economics throughout the lifecycle of a project. During the classes, some estimation tools are presented along with their phases of use. The main objective of this course is to facilitate the quick identification of construction costs in the preliminary phases and to identify them in detail during the advanced phases of the project.

Fire Safety

The course "Fire Safety" aims to introduce engineering students to the fire safety regulations applicable to buildings. Given the density of fire safety regulations, this day provides students with concepts related to construction measures that help prevent fires and protect themselves in the event of a fire.

COURSE NAME	HOURS	ECTS
S7 - City Metabolism	36h	3

Urban Hydrology

The course "Urban Hydrology" enables engineering students to analyze hydrological data, create statistical models to estimate rainfall or flow quantiles, utilize a conceptual rain-flow model, determine the boundaries of a watershed, and calculate design rains and peak flows for an urban watershed while considering its drainage network. The students are also trained to identify hydrological processes, risks, and impacts of climate change related to the water cycle.

COURSE NAME	HOURS	ECTS
S7 - Mobility and transportation	18h	2

Supply and Mode of Transport

The course "Supply and Mode of Transport" aims to provide an overview of the various modes of transportation in urban areas, highlighting the main challenges associated with each in terms of both economic development and environmental impact.
The course successively addresses the issue of public transportation, its hierarchy, and its importance in urban development, followed by the topic of individual mobility, its integration into the urban environment, and its effects on the environment. The sessions are supported by concrete case studies and practical exercises.

COURSE NAME	HOURS	ECTS
S7 - Numerics and applied mathematics	36h	3

BIM - Building Information Modeling

The "BIM" course enables engineering students to create a 3D digital model of a simple building using Revit by drawing basic elements such as walls, floors, roofs, columns, ventilation ducts, pipes, roofs, terrains, lines, and rectangles. At the end of the course, the student is capable of creating floor plans and sections, as well as generating quantity takeoffs from the model. Additionally, they know how to compile multiple IFC models. Finally, they are able to explain the principles and objectives of the BIM process and describe the main benefits of a BIM process.

COURSE NAME	HOURS	ECTS
S7 - Human and Social Sciences	42h	2

Project Management

At the end of the course "Project Management," the engineering student is able to plan a project using management software, PERT, and GANTT charts. They can also assess technical and operational risks by conducting a risk analysis and lead effective project follow-up meetings.

Change Management

The course "Change Management" enables engineering students to understand how to successfully implement a change project within an organization, engaging team members while considering the natural resistance to change. By the end of the course, students will grasp the key principles of change management to address the numerous and necessary transformations that companies undergo.

Economics and Business Organization

The course "Economics and Business Organization" enables engineering students to recognize the various types of companies based on their legal structure and organizational principles. By the end of the course, students will know how to analyze an organizational chart and identify the different functions of the company. Furthermore, they will be able to understand key financial statements such as the income statement and the balance sheet, by identifying various items and locating relevant information.

COURSE NAME	HOURS	ECTS
S7 - International opening	42h	2

English 1: acquisition of B2 level

The English course enables engineering students to achieve a B2 level in English, meaning they are capable of understanding complex lectures or speeches, answering questions about articles with differing viewpoints, participating in conversations with native speakers, expressing themselves in detail on various topics, and writing clear texts about their interests or well-argued reports.

Living language 2: Spanish, Italian, German, Portuguese, Mandarin

The living language course should enable engineering students to present topics related to urban engineering fluently in German, Spanish, Italian, Mandarin, or Portuguese, to create technical summaries in these languages, to conduct professional discussions and negotiations, to participate in job interviews, and to write persuasive CVs and cover letters in these languages. Additionally, they should be able to conduct bibliographic research in scientific databases and write critical research reviews in the chosen language.

Université Gustave Eiffel

2nd year
Semester 8

EIVP

COURSE NAME	HOURS	ECTS
S8 - Urban planning and management	54h	5

Managing a Development Project

The course "Managing a Development Project" enables the engineering student to understand and master the various stakeholders involved in a development project, as well as their respective roles. It also teaches them how to choose the most suitable operational and financial structure for a given case, justifying their decision. Furthermore, the student is capable of identifying the key stages of a development project and proposing solutions to optimize the timeline and/or budget of the operation.

Citizen Participation and Co-Construction

The course "Citizen Participation and Co-Construction" enables students to explain the various forms of citizen participation, recognize the stakeholders involved in a public spaces project, conduct a technical diagnosis to identify technical issues influencing design choices, perform a sensitivity analysis and study of usages, and propose a co-construction approach for the project.

Urban Soils and Subsoils

The course "Urban Soils and Subsoils" enables engineering students to understand the nature and uses of urban soils and subsoils, geotechnical risks, soil pollution issues (diagnosis and remediation), and preventative archaeology in urban environments.

COURSE NAME	HOURS	ECTS
S8 - Research	12h	1

Research initiation

The research initiation week is a thematic week dedicated to discovering what scientific research entails, the doctoral studies in urban engineering, the role of laboratories, and the various stakeholders in research. Students take on the role of researchers conducting a state of the art review on a topic of their choice, allowing them to justify research questions. They can manipulate bibliographic research tools, identify, and utilize relevant resources for their topics, including articles from scientific journals, book chapters, and technical literature. This week also provides an opportunity to present the research conducted at EIVP, including the participation of former doctoral students.

COURSE NAME	HOURS	ECTS
S8 - City metabolism (1/2)	141h	10

Urban Metabolism Project

The "Urban Metabolism Project" allows engineering students to take on the role of technical designers (engineering consultants) who support a project owner in a chosen area of sanitation, drinking water, or waste collection. After conducting a general assessment of the urban area and a technical diagnosis, the various groups must propose management solutions for stormwater and wastewater or design a drinking water network or a waste collection service. Students are required to estimate the costs of their designs and strive to develop well-justified innovative solutions. Finally, the project is presented both in writing and orally before a jury of professionals and students. The project also enables students to position themselves within a network of public stakeholders by questioning other projects in the role of service provider / operator / consultant / project owner.

Sanitation (stormwater and wastewater)

The course "Sanitation" enables engineering students to understand the regulations in force in a given area, to design a sanitation network, to size water management structures and wastewater collection networks, to identify sources of pollution, and to describe techniques for treating wastewater and rainwater, as well as to explain sludge treatment techniques based on their type.

COURSE NAME	HOURS	ECTS
S8 - City metabolism (2/2)	141h	10

Drinking Water

The objective of the course "Drinking Water" is to enable students to understand, diagnose, and size the drinking water supply of a city, from the resource to the consumer. This includes assessing needs and resources, understanding water transport methods, treatment, storage, and distribution. Possible technical issues as well as current regulations are also addressed. Upon completion of the training, the student will have a comprehensive view of the drinking water supply system.

Waste and Urban Cleanliness

The course "Waste and Urban Cleanliness" enables engineering students to identify the stakeholders responsible for waste management, understand the regulations in force, become familiar with the various waste collection systems, size the waste production and necessary collection systems, and utilize GIS tools.

COURSE NAME	HOURS	ECTS
S8 - Mobility and transportation	18h	1

Design of Cycling Infrastructures

The course "Design of Cycling Infrastructures" enables engineering students to apply regulations and technical recommendations for integrating cycling infrastructures into urban planning projects. They will also be able to propose modifications to traffic plans to facilitate the integration of bike lanes and design high-quality facilities.

COURSE NAME	HOURS	ECTS
S8 - Numerics and applied mathematics	36h	2

GIS - Geographic Information System

The “SIG” course enables engineering students to select geo-numeric data to address a specific question by evaluating their relevance, to answer a posed question by analyzing geo-numeric data, and to present the results of a diagnosis in the form of a geo-numeric resource map.

COURSE NAME	HOURS	ECTS
S8 - Human and Social Sciences (1/2)	95h	4

Entrepreneurship and innovation week

During the entrepreneurship and innovation week, students are placed in the role of engineer-entrepreneurs, acting as "start-up creators" with the management of all responsibilities and a comprehensive understanding of their innovative idea (including technical, scientific, economic, financial, legal, managerial, and marketing aspects, etc.). Students are required to research information, verify its validity, and select the useful information.

At the end of the week, students must present their project in a few minutes, highlighting the techno-economic advantages of their solution and addressing any potential limitations; this presentation must be delivered in both French and English.

Management of Corporate Social Responsibility (CSR)

The course "Management of CSR" enables engineering students to understand the fundamentals of CSR and sustainable development, critically analyze CSR initiatives and business practices, utilize tools and concepts associated with CSR, convincingly present the benefits of CSR, and propose innovative solutions inspired by international best practices to address environmental, social, and economic challenges.

Multi-Stakeholder Communication and Consultation

The course "Multi-Stakeholder Communication and Consultation" enables engineering students to critically analyze the communication strategies of actors in specific situations, identify the specific challenges and obstacles encountered in complex intercultural contexts, and formulate recommendations to improve communication among the actors.

COURSE NAME	HOURS	ECTS
S8 - Human and Social Sciences (2/2)	95h	4

Territorial Policy and Public Finances

The course "Territorial Policy and Public Finances" enables engineering students to understand and analyze an operating budget and an investment budget based on a concrete case. They are also capable of identifying the various stakeholders involved in financing a local authority, differentiating between amounts excluding tax (HT) and including tax (TTC), as well as managing VAT within a budget. Finally, they are able to grasp the concept of total cost, distinguish between capital expenditures and operating expenses, and identify the associated budgets.

Career conference

The career conference provides engineering students with the opportunity to explore a variety of professions related to urban engineering, through the testimonials of professionals from different sectors.

COURSE NAME	HOURS	ECTS
S8 - International opening	36h	2

English 1: acquisition of B2 level

The English course enables engineering students to achieve a B2 level in English, meaning they are capable of understanding complex lectures or speeches, answering questions on articles that present differing viewpoints, participating in conversations with native speakers, expressing themselves in detail on various topics, and writing clear texts about their interests or well-structured reports.

Living language 2: Spanish, Italian, German, Portuguese, Mandarin

The LV2 course should enable engineering students to present topics related to urban engineering fluently in German, Spanish, Italian, Mandarin, or Portuguese, to develop technical summaries in these languages, to engage in professional discussions and negotiations, to participate in job interviews, and to write persuasive CV and cover letters in those languages. Furthermore, they should be able to conduct bibliographic research in scientific databases and write critical research reviews in the chosen language.

COURSE NAME	DURATION
S8 - “Studies and research” internship	12 weeks

The internship in studies and research provides students with the opportunity to discover the world of Higher Education and Research, both in France and internationally, through internship assignments. Students are encouraged to explore scientific work in research laboratories in France and abroad. If a student has a clearly identified preference for research, technical expertise, and innovation, it is also possible to complete their internship in one of these fields. For students not planning an exchange or a double degree abroad, this internship offers the chance to gain international professional experience (mostly in research laboratories), to practice English and/or the local language if well mastered, and to fulfill the requirement for an international stay as part of their degree program.

Université Gustave Eiffel

3rd year
Semester 9

EIVP

COURSE NAME	HOURS	ECTS
S9 - Urban planning and management (1/2)	186h	16

Urban Planning Project

The "Urban Planning" project allows students to work in groups of 4 or 5 on the development of local public spaces that accommodate everyday uses. As part of a collaboration between the school and a municipality in Île-de-France, students conduct a technical diagnosis and, based on a programming workshop with the community stakeholders, they formulate two development proposals: a street allocation strategy that enables a rapid transformation of the site, and a development project that includes the rehabilitation of road infrastructure.

In these neighborhoods, the distribution of public space is currently unfavorable to pedestrians and active modes of transport. Therefore, the goal is to propose developments that enable the rebalancing of urban activities based on the program established with the community stakeholders. Consideration is given to the coexistence of humans and nature in the city in order to integrate these sites into the regional green and blue framework.

Designing Public Spaces

The course "Designing Public Spaces" enables engineering students to dimension the various components of a public space in accordance with current regulations, while addressing usage and mobility objectives (such as sports, play, and street habitation). Students learn to draw cross-sections and site plans based on a given program, the available width of the public space, and various regulations. By the end of the course, students are also capable of proposing circular economy solutions by detailing the implementation based on a practical case of transforming a public space. They will design greening solutions, dimension and plan public lighting, identify the different competent services for various networks, and describe the specific technical constraints associated with each network.

COURSE NAME	HOURS	ECTS
S9 - Urban planning and management (2/2)	186h	16

Real Estate

The course "Real Estate" enables engineering students to identify the stakeholders and phases of a real estate operation, address the financial and environmental aspects of a project, and draft a detailed summary note that allows for the analysis of risks and feasibility of the project, evaluation of costs and benefits, assessment of environmental impact (carbon footprint), and establishment of a comprehensive timeline.

Building Management and Operations

The course "Building Management and Operations" enables engineering students to define a management and operational policy for buildings through the example of a social housing provider's asset strategy. The regulatory context, the characteristics of the property portfolio, and its occupancy determine the asset strategy, as well as the social and environmental issues.

Project Financing

The course "Project Financing" enables the engineering student to understand the skills and contractual relationships of the financial stakeholders in a Project Finance context, to describe the financial parameters that allow for the management of a project's financial performance, to analyze the distribution of risks in a partnership contract, and to compare it with other types of contracts.

Universal Accessibility

The course "Universal Accessibility" enables engineering students to identify various types and situations of disabilities, explain the fundamental principles of universal design, and create a specification document for universal design.

COURSE NAME	HOURS	ECTS
S9 - Option	186h	16

Governance and water issues (option)

The course "Governance and Water Issues" allows students to integrate current major water challenges in urban areas (sustainable development, climate change, etc.), leading to the need to rethink the urban water cycle to make it more resilient. Additionally, the course provides specific elements related to the operation of drinking water networks and project management, thereby complementing the technical component of the second-year courses.

Transport governance and economics (option)

The course "Governance, Transport Economics, and Foresight" addresses passenger and freight transport policies. Mobility policies are always implemented within a complex and regulated collaborative framework.

The objective of the governance and transport economics course is to enhance understanding and knowledge of the institutional and organizational context of mobility projects and public policies in order to promote the development of strong professional skills in the passenger and freight transport sectors.

COURSE NAME	HOURS	ECTS
S9 - Mobility and transport	63h	4

Analysis and Design of a Transportation System

The course "Analysis and Design of a Transportation System" covers transport demand, supply concepts, and the notion of elasticity between supply and demand. By the end of the course, the engineering student is capable of developing a transportation system or network that addresses the challenges of land development, urban planning, and environmental or climatic impact. The evaluation of performance and levels of service is also central to this course, which draws on narratives and lessons from concrete projects. It creates valuable links between disciplines and project scales.

Transport Modeling

The course "Transport Modeling" focuses on the management of traffic light intersections in urban areas, the sizing of infrastructure, and operational simulations in relation to their environment and the overall mobility context.

COURSE NAME	HOURS	ECTS
S9 - Numerics and applied mathematics	18h	2

City Information Model 3D

The course "City Information Model 3D" enables engineering students to create a three-dimensional model of a territory using geo-digital data, add visual elements to this model, and conduct 3D spatial analysis using both 2D and 3D geo-digital data with the help of a ready-to-use tool.

COURSE NAME	HOURS	ECTS
S9 - Human and Social Sciences	48h	4

Innovation Management

The course "Innovation Management" enables engineering students to understand the scope of key concepts related to innovation and its dynamics, and to foster effective communication and collaboration within a project team. At the end of the course, students are also capable of incorporating a continuous improvement approach through quality and lean management in the implementation of a project, and of adjusting strategies based on data analysis and the desired outcomes.

Public Procurement and Stakeholder Dynamics 2

The course "Public Procurement and Stakeholder Dynamics 2" enables engineering students to select the most relevant consultation for a given case, to write an analysis of a bid criterion based on a consultation regulation and various offers, and to plan the awarding of a contract according to the type of consultation chosen.

Visual communication

The course "Visual Communication" aims to teach the fundamentals of visual communication. The instruction is primarily focused on identifying and drafting various written communication materials (scientific posters, presentations, etc.) that engineers need to know and master. Methodological aspects that facilitate their production are also taught.

Career conference

The career conference provides engineering students with the opportunity to explore a variety of professions related to urban engineering, through testimonies from professionals from various sectors.

Université Gustave Eiffel

3rd year
Semester 10

EIVP

COURSE NAME	DURATION
S10 - End-of-studies project Accessible only to exchange students as part of a dual diploma	24 weeks

During the TFE internship, the engineering student, integrated into a professional environment (administration, design office, company, research laboratory), responds, either alone or as part of a team, to a request in the field of urban engineering. The student addresses all technical, scientific, economic, and human aspects that characterize the engineer's mission.

In this context, the student solves concrete technological questions related to the design, implementation, and use of products, systems, or services. To do this, they must apply a set of knowledge acquired throughout their studies and, if necessary, supplement it to fulfill the request.