

**UTSEUS - SHANGHAI UNIVERSITY**  
**Urban Data Science Research**

**COURSE ON**  
**CITIES INTRODUCTION FOR URBAN DATA RESEARCH:**  
**A JOURNEY THROUGH CITIES DEVELOPMENT AND PLANNING MODELS**

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## 1. COURSE OVERVIEW

### 1.1. Title

**Cities Introduction for Urban Data Research:**

A Journey Through Cities Development and Planning Models

### 1.2. Duration

5 Classes (1 hour and 45 minutes each)

### 1.3. Creators

**Dominique Badariotti:** Geographer specializing in urban studies, Director of Laboratoire: Image, Ville, Environnement (L.I.V.E.); contributing a rich historical perspective on city development.

**Fabien Pfaender:** Computer scientist with a focus on urban data analytics, French Dean of UTSEUS; providing insights into the technical aspects of urban research.

**John Villar:** Architect with extensive experience in multicultural urban developments, Chief Researcher of Desirable Cities project, with guidance from Badariotti and Pfaender; leading the presentation and workshops of this course.

## **2. INTRODUCTION TO THE COURSE**

Welcome to a comprehensive exploration of urban development and planning models. This course delves into the intricacies of city evolution, examining the complex interplay between urban environments, their inhabitants, and the infrastructural systems that support urban life. Rooted in the discipline of Urban Data Sciences, this curriculum bridges historical perspectives with future possibilities, offering insights and tools for innovating within the urban spaces that encapsulate people's collective needs, challenges, aspirations, and desires.

### **2.1. Purpose**

This course is designed to emphasize the critical constants in urban data science research: (1) the environment, (2) its people, and (3) the city systems that facilitate human development. Through examining the evolution of urban landscapes, students will gain a balanced understanding of how these three components interact, serving as the foundation for enhancing city life and informing sustainable urban planning practices.

### **2.2. History's Timeline**

This journey begins with the formation of Planet Earth's (Environment), advancing through the emergence of Homo Sapiens (People), and tracing the development of the first human settlements (The beginning of city systems). From the Stone Age to the Bronze and Iron Ages, and through Classical Antiquity to the Middle Ages, we navigate the milestones that have shaped the different cities of human civilizations. The timeline extends into the Modern and Contemporary Eras, highlighting technological and societal advancements' roles in shaping today's urban environments. This broad historical canvas underlines the importance of maintaining equilibrium with the environment, fostering health, and harnessing technology for sustainable urban living.

### **2.3. Environment and Data**

The environment, the foundation of life, significantly shapes city landscapes and outcomes. As Urban Data Science Researchers, students will learn the importance of extracting and analysing environmental data, as well as understanding its profound impact on urban planning and the sustainable development of future cities.

### **2.4. People and Data**

At the heart of every city are its inhabitants. This course encourages the awareness of mental and physical health within urban contexts, emphasizing the link between well-being and urban design. Students will learn the importance of gathering and interpreting data on urban populations to foster healthier, more vibrant communities.

## **2.5. Systems and Data**

Cities are a mix of complex networks of transportation, utilities, and social activities and services. Understanding these systems' intricacies and the data they produce is crucial for Urban Data Science Researchers. This knowledge enables the extraction of insights critical to developing more ecological, humanistic, and intelligent urban infrastructures.

### **3. COURSE OBJECTIVES**

- To emphasize the significance of the environment, people, and urban systems to support people's life within the evolution of urban development and planning models from ancient times to the 21st century.
- To emphasize the significance of extracting and analysis the: environment, people, and urban systems within urban data science research.
- To equip students with the ability to critically analyse cities and to propose enhancements to urban spaces through the lens of urban data science, that prioritises: the environment, its people, and the urban systems that support people's well-being.

## 4. COURSE CONTENT

### **4.1. Class 1: Course Introduction and Ancient to Renaissance Cities**

Scheduled for Tuesday, the 12th of March 2024, from 1:00 pm to 2:45 pm, at UTSEUS, Shanghai University. This session is structured into three parts, each lasting approximately 30 minutes with two 5-minute breaks in between.

#### **4.1.1. Class 1 - Part 1: Introduction to the entire course and to the first human settlements and cities**

30 minutes divided as follow:

##### 4.1.1.1. Introduction to the entire course

5 minutes introduction of the course and its purpose.

##### 4.1.1.2. Introduction to timeline and world's first human settlements

25 minutes introduction to a timeline diagram, drawing on real-time at the board (as a referential structure to contextualise the space-time relationship of the class content), in parallel with a presentation of digital slides projected next to the board.

##### 4.1.1.3. Theoretical framework content of first human settlements

#### ❖ WORLD'S FIRST SETTLEMENTS AND CITIES

Archaeological discoveries have shown how ancient people began to create settlements to meet their basic needs. In these communities, they developed the necessary conditions for a stable life, including agriculture and livestock farming, food and drink storage, areas for family life, and structures for protection against the weather and potential threats. This evolution of developing, organising, and improving their liveable spaces, its systems, and their tools, highlights the ingenuity and adaptability of people in shaping their environment to support their communities.

This transition, spanning from around 9000 BCE at the Stone Age to the early Bronze Age 500 BCE, saw societies evolve from nomadic lifestyles to settled urban communities. Various factors such as economic conditions, social structures, and technological advancements played crucial roles in the development of these early settlements across the globe. These include regions like the Middle East, Africa, South Asia, East Asia, Europe, North America, Central America, and South America. This period marks a significant shift in human history, showcasing the diverse pathways through which civilizations emerged and flourished around the world. (Bairoch 1991; Clark 2013; LeGates and Stout 2016).

#### ➤ MIDDLE EAST:

The Middle East, particularly the area known historically as Mesopotamia, nestled between the Tigris and Euphrates rivers, is often cited as the cradle of civilization. Spanning modern-day Iraq, Iran, Syria, and Turkey, this region saw the rise of the world's earliest cities from around 9000 BCE. The fertile river valleys stimulated agricultural advancements. These cities became hubs for

trade, politics, culture, and religion, as well as major contributors in architecture and technology. Among the notable ancient settlements are:

- Jericho:  
Dating back to 9000 BCE, Jericho, located in the Jordan River Valley, is one of the oldest continually inhabited cities. Its strategic position and access to water made it a key early settlement, renowned for its significant stone walls built around 8000 BCE, showcasing some of the first urban fortifications.
- Uruk:  
Around 4000 BCE, Uruk marked a significant urban revolution with the introduction of cuneiform writing, monumental architecture, and complex social hierarchies. Its ziggurats and sophisticated irrigation systems highlight early engineering achievements and the city's role in trade and cultural innovation.
- Eridu:  
Believed to be the oldest city in Sumer, dating back to about 5400 BCE, Eridu held religious significance, with the temple of Enki indicating the integral role of religious institutions in city life and urban planning.  
(Adams 1981; Bairoch 1991, 25–27; Gates 2011, 11–51; Lees 2015, 1–14; McMahon 2013, 31–45)

### ➤ AFRICA:

With its vast and varied landscapes, Africa had the emergence of some of the world's first and most enduring civilizations, particularly along the Nile River in what is now Egypt. Circa 3000 BCE, the Nile Valley, with its fertile floodplains, provided an ideal environment for the development of agriculture, supporting dense populations and the rise of organized states. These civilizations were pioneers in writing, architecture, and governance, setting precedents that would shape future societies. Beyond being political centres, these settlements were trade, innovation, and cultural hubs, showcasing interactions across the continent. Key ancient African settlements include:

- Memphis:  
Founded around 3100 BCE, Memphis served as Ancient Egypt's capital during the Early Dynastic Period. At the Nile Delta's apex, it was a crucial cultural, religious, and political hub, linking Upper and Lower Egypt. Home to Ptah, the patron deity of craftsmen and architects, Memphis was pivotal in art, architecture, and urban planning development. Its strategic location promoted trade and communication, highlighting its role as a melting pot of ancient Egyptian civilization.
- Thebes:  
Rising to prominence around the 11th Dynasty (circa 2081–1939 BCE), Thebes later became the capital during the Middle and New Kingdoms. Positioned along the Nile, it was the spiritual centre of Egypt, housing the Karnak Temple complex and Luxor Temple, significant religious sites. As the



gateway to the Valley of the Kings and Queens, Thebes was central to Egypt's religious and cultural life, with its architecture and art reflecting Egyptian civilization's sophistication.

- Abydos:

Around 3100 BCE, Abydos became a crucial religious site, especially as the cult centre of Osiris, the afterlife god. Considered the underworld's entrance, its necropolis was the burial site for early rulers, signifying the city's spiritual significance. Abydos is famed for its temples, like the Temple of Seti I, adorned with detailed reliefs and inscriptions, offering insights into ancient Egyptian beliefs and practices.

(Aston and Jeffreys 2007; Bairoch 1991, 25–29; Gates 2011, 78–82; Lees 2015, 1–14; Mattingly and MacDonald 2013; Mumford 1961, 29–35; O'Connor 2009; Rhind 2002)

➤ SOUTH ASIA:

In the South Asia region, now known as the Indian subcontinent, the Indus Valley Civilization (IVC) emerged around 2600 BCE, marking a significant advance in urban planning, trade, and societal organization. Renowned for its sophisticated cities, advanced water management, and vast trade networks, the IVC thrived in the Indus River's fertile floodplains. This enabled the development of densely populated urban centres, famous for their grid layouts, standardized measurements, and impressive architecture, showcasing an advanced grasp of city planning and governance. Despite its decline around 1900 BCE, the IVC's influence persisted, shaping South Asian history. Key settlements include:

- Harappa and Mohenjo-Daro:

These cities, flourished around 2600 BCE, and were the IVC's core, as both were known for their orderly urban design and early sanitation systems. Harappa, alongside Mohenjo-Daro in present-day Pakistan, was a manufacturing and trade center with ties as far as Mesopotamia. Mohenjo-Daro is famed for its Great Bath, emphasizing the civilization's focus on cleanliness and ritual. Together, they demonstrate the IVC's societal and technological progress, portraying an early yet sophisticated urban lifestyle.

- Kalibangan:

Located on today's Rajasthan's Ghaggar-Hakra River, Kalibangan dates back to 2900 BCE and showcases the IVC's cultural phases. Its findings, including fire altars and a grid-patterned city plan, shed light on the Indus Valley people's religious practices and urban layout.

- Lothal:

As a port city in modern Gujarat, India, around 2400 BCE, Lothal was pivotal for maritime trade across the Arabian Sea, linking the Indus Valley with distant lands. Its artifacts and architecture display meticulous craftsmanship in various industries, while its city planning and water management reflect

the ingenuity of Indus engineers, particularly in adapting to coastal conditions.

(Bairoch 1991, 39–42; Kenoyer 1998; 2008; Petrie 2013, 83–96)

➤ EAST ASIA:

East Asia, rich in diverse landscapes and climates, has been pioneer in early agricultural, urban, and state innovations. This region, which includes modern-day China and its surroundings, saw the rise of complex societies that utilized the fertile valleys of the Yellow River and Yangtze River to boost agricultural output. Transitioning from Neolithic villages, these societies evolved into organized city-states and early empires, marked by advancements in metalworking, ceramics, and writing. The Yellow River valley, the "Cradle of Chinese Civilization," was instrumental in the formation of the Xia, Shang, and Zhou dynasties, foundational to Chinese culture, philosophy, and governance. These early civilizations fostered sophisticated urban centers, ceremonial complexes, and technological progress, highlighting East Asia's significant contributions to human development. Among the earliest settlements in East Asia are:

- Erlitou:

Situated in Henan Province, China, Erlitou is believed to be the Xia dynasty's location, dating back to 1900 BCE. As one of East Asia's initial urban centers, it was pivotal in the shift from Neolithic settlements to complex societal structures. Characterized by palatial complexes, bronze foundries, and ceremonial buildings, Erlitou showcases early Chinese civilization's metallurgical skills and centralized governance. The settlement's layout and artifacts offer insights into its social organization, technological prowess, and cultural achievements.

- Anyang:

In Henan Province, Anyang was a capital of the Shang dynasty around 1300 BCE. Famous for its oracle bone inscriptions, Anyang provides early examples of Chinese writing, shedding light on the Shang's societal, religious, and monarchical aspects. Archaeological finds, including royal tombs and bronze casting workshops, reflect the dynasty's ritualistic sophistication, craftsmanship, and urban planning. Anyang exemplifies the development of hierarchical societies and the significance of ritual and ancestor worship in early Chinese statehood.

- Zhengzhou:

Also in Henan Province, Zhengzhou is linked to the Shang dynasty's early days, with origins around 1600 BCE. Its archaeological discoveries, such as defensive structures, urban planning, and bronze production sites, underline the Shang's urban, political, and technological advancements. As a political and cultural hub, Zhengzhou's importance during the Shang era highlights centralized power's role in societal regulation and territorial expansion,

illustrating the early interplay of political, economic, and religious activities in Chinese urban development.

(Bairoch 1991, 42–45; Liu 2004; Liu and Chen 2012; Steinhardt 2013)

➤ EUROPE:

Europe development started in the Mediterranean region, bridging Europe, North Africa, and the Near East, through the navigable water of its seas (Mediterranean, Aegean, Ionian, Adriatic, Tyrrhenian, Balearic, and Alboran seas). It experienced the transition from small Neolithic villages to large urban centres, marking the start of state formation, extensive trade networks, and cultural developments. The Mediterranean's strategic location enhanced the exchange of goods, ideas, and technologies, enriching its diverse cultural landscape. Key developments like olive and grape cultivation, along with livestock domestication, supported the rise of populous urban centres. Notable ancient Mediterranean settlements include:

- Knossos:

Situated on Crete, this site dates from around 2000 to 1400 BCE and was central to the Minoan civilization. Famous for its elaborate palace, linked to the myth of King Minos and the Minotaur, Knossos showcases advanced Minoan architecture, plumbing, and art, highlighting a society skilful in artistry, trade, and seafaring.

- Tiryns:

In Greece's Peloponnese, Tiryns was a key Mycenaean stronghold, known for its massive "cyclopean" walls, attributed in mythology to the cyclopes. Dating back to before 1200 BCE, its remains, including a palace complex and religious site, shed light on Mycenaean social organization, military strength, and architectural prowess.

- Pylos:

Also, a Mycenaean site, Pylos is known for the well-preserved Palace of Nestor, dating to around 1300 BCE. Located in the southwest Peloponnese, Pylos has yielded numerous Linear B tablets, offering deep insights into the Mycenaean administration, economy, and religion. Pylos underscores the intricacy of Mycenaean society and its significance in Mediterranean trade and diplomacy.

(Bairoch 1991, 285; Dickinson 2006; Higgins 1981; Osborne and Wallace-Hadrill 2013, 137–38)

➤ NORTH AMERICA:

Before Europeans arrived, North America was rich with diverse communities, known today as "indigenous" cultures, each with unique traditions and social structures. The Olmec civilization, flourishing in south-central of today's Mexico, from around 1400 to 400 BCE. Olmec is one of Mesoamerica's earliest and most influential cultures in this part of the continent, known as the "mother

culture," which paved the way for future complex societies like the Maya and Aztecs. They developed remarkable sculptures, advanced calendars, and detailed social systems. Similarly, Native American cultures developed settlements tailored to their environments (on today's Canada and USA), showcasing their creativity and adaptability. Key early North American settlements include:

- Poverty Point:  
Dating from 1700 to 1100 BCE in what is now Louisiana, USA, this site is recognized for its significant earthworks and intricate settlement design, suggesting it was a major trade centre.
- San Lorenzo:  
Active between 1200 and 900 BCE, this site is among the Olmecs' earliest urban centres, famous for its massive stone head sculptures representing Olmec leaders or gods.
- Tres Zapotes:  
Emerging around 900 BCE and enduring into the Epi-Olmec period, Tres Zapotes is celebrated for its cultural persistence and impressive stone sculptures, offering a glimpse into the Olmec to Epi-Olmec cultural transition. (Gibson 2001; Coe and Koontz 2013; Pool 2007)

### ➤ CENTRAL AMERICA:

Central America's rich biodiversity and landscapes fostered the emergence of significant civilizations during the pre-Columbian times, notably the Maya civilization. This region, stretching from today's Southern Mexico to parts of Central America, leveraged its fertile lands and tropical weather, for advanced agriculture, supporting dense populations and urban development from 1700 to 1100 BCE. These societies are marked by their impressive architecture, intricate calendrical and mathematical knowledge, and rich artistic heritage. Central America's prime location enabled vast trade networks, enhancing cultural and technological exchanges. The establishment of city-states illustrated sophisticated governance, social, and religious practices shaping Central American history. Notable early settlements include:

- Tikal:  
In present-day northern Guatemala, Tikal stands as a monumental Maya city-state, thriving between 600 BCE and 900 CE. It was a key centre for culture, politics, and commerce, boasting grand temples and plazas. Its pyramid temples and advanced agricultural systems underscore the Maya's architectural and environmental ingenuity.
- Copán:  
Located in today's western Honduras, Copán was famed for its artistic and intellectual contributions, flourishing post-1000 BCE. Known for its hieroglyphic stairway and stelae, Copán highlights the Maya's advancements in astronomy, mathematics, and writing.

- Uaxactun:

Near Tikal, Uaxactun is celebrated for its contributions to Maya astronomy and architecture, particularly from 900-300 BCE. Its “E Group complex” and observatories illustrate an advanced understanding of astronomy's role in society and religion.

(Fernandez-Armesto 2013, 364–67; Martin and Grube 2008; Sharer and Traxler 2006)

- **SOUTH AMERICA:**

From the Andes Mountain to the Amazon rainforest, South America's varied landscapes nurtured early civilizations with remarkable engineering, agricultural, and astronomical skills. The Andean region, in particular, stood out for its rich biodiversity and climate diversity, fostering agricultural innovations such as terrace farming and textile weaving. These early societies laid the groundwork for later advanced cultures like the Inca Empire, showcasing their ingenuity through extensive trade and communication networks. Noteworthy ancient South American settlements before the Inca Era includes:

- Sechín Bajo:

Situated in present-day Peru's Casma Valley, Sechín Bajo, dating back to 3500 BCE, is among the Andes' oldest archaeological sites. The presence of a ceremonial plaza highlights the area's long-standing ritual complexity. The site offers a window into early Andean culture, stressing the role of ceremonial centres in community life.

- Chavín de Huántar:

Founded around 1200 BCE in where is today Peru's northern highlands, Chavín de Huántar was a pivotal religious and cultural hub influencing the wider Andean region. Its notable stone constructions, detailed carvings, and subterranean corridors underscore the inhabitants' engineering prowess and religious depth. Key features like the Lanzón monolith and Tello Obelisk represent the Chavín culture's intricate religious imagery and practices.

- Caral:

Positioned in the Supe Valley near what is today Peru's central coast, Caral stands as one of the Americas' oldest cities, established around 2600 BCE. The city's extensive urban planning, including pyramid-like structures and residential zones, indicates a sophisticated social structure. Discoveries of musical instruments and evidence of long-distance trademark Caral's cultural advancement and pivotal role in Andean civilization's genesis.

(Burger 1995; Fernandez-Armesto 2013, 364–67; Haas, Creamer, and Ruiz 2004; Shady 2004)

- **SUMMARY OF THE WORLDS' FIRST SETTLEMENT AND CITIES:**

The striking similarity in the functional aspects of settlements and cities across these 8 distinct global regions where the first human's settlements emerge,

underscores a shared foundational goal: **enhancing permanent community life** within its spaces.

Despite the absence of cross-communication, these early settlements and first cities universally aimed to facilitate everyday people's activities, positioning cities as essential spaces for sustaining life. In other words: **Cities are spaces designed for people** to carry-on their live.

As these communities evolved, they became more organized and structured, illustrating how cities are deliberately designed systems that cater to the needs and aspirations of their inhabitants. Therefore, it is also important to highlight that: **Cities are systems** designed for people's life to thrive.

However, when we examine the aesthetic outcomes of these regions' settlements and cities, becomes evident that the influences of their local: materials, climate, and cultural self-developed factors, made a distinctive differences on its appearances, creating a **distinct character and aesthetic appeal** for each civilization's unique environmental and cultural context.

In conclusion, cities are since its origins, more than 11.000 years ago, **spatial systems design for people, focused on its functionality** for providing to its people their required conditions for living, **with distinctive aesthetic qualities** related to its circumstances. Thus, the study of urban models allows the comparison analysis of this relationship between functionality and aesthetic (efficiency and appearance), of the diverse propositions and approaches of city developments, over time, in the different regions of the world.

## 5 MINUTES BREAK

### 4.1.2. Class 1 - Part 2: Ancient Greek and Roman urban models

30 minutes class, continue to be supported with the timeline diagram, drawing on real-time at the board (as a space-time referential structure to contextualise the class content), and with a digital presentation of slides projected in parallel next to the board. Divided as follow:

#### 4.1.2.1. Introduction to this second part

5 minutes explanation of how for time management reasons, the focus of urban models will be only in Europe.

#### 4.1.2.2. Introduction to Greek and Roman models

25 minutes introduction divided as follow: 10 minutes for the Greek model; 10 minutes for the Roman model; and 5 minutes for the summary and conclusion.

#### 4.1.2.3. Theoretical framework content of Greek and Roman models

### ❖ LATE BRONZE AGE, IRON AGE, AND CLASSICAL ANTIQUITY'S URBAN MODELS IN EUROPE

Focusing on the development of urban models in Europe during ancient times (circa 800 BCE – 500 CE), we delve into the Greek and Roman contributions that

shaped early urban planning, emphasizing their integration of functionality with aesthetic and social dimensions. These civilizations, flourishing in distinct historical periods, laid the groundwork for urban development in Europe that combined practical needs with cultural and political expressions.

### ➤ ANCIENT GREEK CITIES MODEL (CIRCA 800-323 BCE)

The Greek city-state, or polis, was more than a physical space; it was a community bound by laws, customs, and institutions. This model of urbanization introduced key concepts to town planning:

- Dual Nature of the City (URBS and POLIS):

Greek cities exemplified the belief that a city is both a constructed entity (URBS) and a social organism (POLIS), highlighting the importance of community and the division of labour. This dual nature underscored cities as spaces designed for living, where the social division and stratification emerged. This approach guaranty to its population:

- ◆ Hygienic living conditions.
- ◆ Protective cities (including defensive and military capabilities).

- Integration of Political and Social Principles in Urban Design:

According to Aristotle, the layout and site choice for a town should mirror prevailing political and social norms. For example:

- ◆ Cities' infrastructure for the oligarchies or monarchies were situated near hills, within the Acropolis or fortress for the ruler's maximum protection, leaving the lower city for the rest of the population, which emphasized social hierarchies,
- ◆ Also established that a democratic city favoured flat landscapes to accommodate large Agora (Central square for public assembly, where people expressed and executed democracy).

- Introduction of the urban intentional Orthogonal plan:

known as "Hippodamean" plan, attributed to Hippodamos of Miletus, showcased an early attempt at organized urban growth, facilitating movement and enhancing city functionality.

(Camp 2003; Camp, Dinsmoor, and The American School of Classical Studies at Athens 1984; I. Morris and Powell 2014; Osborne 2009; Burns 1976)

### ➤ ANCIENT ROMAN CITIES MODEL (CIRCA 753 BCE – 476 CE)

Expanding upon Greek foundations, Roman urban planning incorporated:

- Grid-based Layouts:

Central to Roman cities were the "decumanus" in the east-west direction and "cardo" in the north-south direction, intersecting at the "Forum" (the Roman equivalent of the Greek Agora). This arrangement fostered a well-organized, navigable urban space, reflecting the Romans' pragmatic approach to city-building.

- Space Rationalization and Zoning:

Roman towns exemplified the efficient division of urban space, allocating blocks for diverse functions and ranks in a spirit of equity.

- Functional and Sacred Cityscape:

The ideal Roman city was more than a matrix. By planning their cities aligned with the cardinal directions, they linked urban design to cosmological and religious beliefs, as the relationship with the sun movement and decumanus, indicates both: the sacred dimension of the city (the god Janus) and its relationship to the world (its universalism). This design facilitates citizens' daily lives, work, and spiritual well-being, illustrating the city as a multifaceted space catering to various aspects of human existence.

When looking at ancient Roman cities, Rome serves as a prime example of Roman urban planning and architecture. The city was meticulously organized into large-scale plots, a method known as the Centuriation principle. Here's a simpler breakdown of how Rome was structured:

- City Layout:

The urban area was divided into blocks, each measuring between 70 and 150 meters on each side. These blocks were intersected by streets of varying widths, ranging from 2.8 metres to over 6 metres.

- Types of Streets:

- Itinera: were narrow paths designed for pedestrians.
- Actus: were slightly wider, accommodating a single cart.
- Viae: were the main streets, wide enough for two carts to pass side by side, facilitating commerce and transport.

- Use of Space:

Each block was further divided into smaller plots for different purposes:

- Public and Monumental Buildings: Spaces were allocated for monuments and government buildings, symbolizing Rome's administrative and cultural significance.
- Residential Areas: Housing varied from collective buildings, known as "insulae" (on plots of 3 to 4 ares), to individual homes or "domus" (Mediterranean villas on plots of 8 to 10 ares), reflecting the city's social diversity.

- Planning Tools:

The layout of Rome was precisely planned by using a "groma", an instrument with a cross and plumb lines, allowing architects to draw straight lines and right angles, essential for the city's orthogonal (grid-like) layout.

This methodical approach to city planning underlines the Romans' commitment to creating organized, functional, and aesthetically pleasing urban environments. Rome's design principles, emphasizing practicality, social order, and beauty, have influenced urban planning for millennia.



(Benevolo 1980; Connolly and Dodge 1998; MacDonald 1982a; 1982b; Rykwert 1976)

➤ **SUMMARY OF EARLIEST URBAN MODELS IN EUROPE**

Encapsulating, the ancient cities in Europe planned political and social spaces (functionality), with geometric designs (aesthetics) showing how important was for their urban model to have:

- **Places for political expression:**  
The Agora and Forum were central to civic life, allowing citizens to gather, discuss, and make societal decisions.
- **Urban social structure:**  
These models organized urban space to create a structured social hierarchy, facilitating division of labour and defining roles, ensuring efficient city life.
- **Manifestations of Cultural Identity:**  
The architecture and design of these cities reflected societal values and technological progress, showcasing community priorities through their grand structures and material choices.

**5 MINUTES BREAK**

**4.1.3. Class 1 - Part 3: Middle Ages and Renaissance urban transformations.**

30 minutes class, continue to be supported with the timeline diagram, drawing on real-time at the board (as a space-time referential structure to contextualise the class content), and with a digital presentation of slides projected in parallel next to the board. Divided as follow:

4.1.3.1. The Middle Ages, and Renaissance models

30 minutes presentation divided as follow: 10 minutes for the Middle Ages model, or medieval cities in Europe; 5 minutes for the summary and conclusion; 10 minutes for the Renaissance cities model; and 5 minutes for the summary and conclusion.

4.1.3.2. Theoretical framework content of Middle Ages, and Renaissance models

❖ **MIDDLE AGES' URBAN MODELS IN EUROPE**

In Europe, the Middle Ages (or Medieval Period as it is also known,) were characterized by profound urban transformations shaped by a myriad of social, political, and religious shifts. This era experienced three significant urban phases:

- Initial period: Shrinking towns (200 - 700 CE):  
The early medieval period witnessed a contraction in urban life, primarily due to barbarian invasions. Many towns faced destruction, leading to a dramatic reduction in their size, such as Périgueux shrinking from 50

hectares to 5.5 hectares and Autun's perimeter contracting from 6 kilometres to 1600 meters. This phase marked a regression from the urban complexity of the Roman era towards smaller, more fortified settlements.

- Second period: Internal redefinition of the towns (700 - 1100 CE):  
Following the era of decline, European towns began a process of internal transformation. The redefinition of urban spaces and social organization gravitated towards a more homogeneous environment, diverging from the stratified Roman city. This period saw the emergence of the "archipelago city," characterized by a dispersion of power centers across the urban landscape, including:
  - Religious:  
Abbeys and bishoprics became focal points for community and spiritual life.
  - Political:  
Castles and courts of princes and nobles exerted local governance.
  - Economic and Civil:  
Suburbs and guilds of craftsmen and merchants flourished, reflecting the growing importance of trade and industry.
- Last period: Urban expansion (1100 – 1400 CE):  
The later medieval period heralded a phase of significant urban growth and demographic expansion, culminating in the development of new urban models such as the Gothic town and bastide. This era of burgeoning urban development was eventually curtailed by the advent of the plague.  
(Gies and Gies 2016; Hodges 1989; 2000; Lilley 2009; 2013; Pirenne 2014)  
Two models of town planning were developed in the medieval period:

#### ➤ GOTHIC TOWN PLANNING

The late Middle Ages witnessed the rise of Gothic architecture, a movement that revolutionized architectural practices and urban planning. Unlike its predecessors, Gothic architecture was distinguished by its innovative use of geometric principles and a blend of functional and aesthetic considerations, thanks to the geometric knowledge of the builders at that time, such as the use of compass (point and wire) and the 13-knot rope (with its 12 intervals: 3, 4, 5).

- Key Features of Gothic Urbanism:
  - Geometric Planning:  
Builders utilized tools such as the compass and a 13-knot rope, embodying Pythagoras' theorem, to create urban spaces that balanced regular and organic forms. This method allowed for complex, yet coherent, urban layouts without adhering to a singular logic like the centre-periphery model.
  - Standardization and Human Scale:  
Gothic planning emphasized the standardization of urban spaces based on anthropometric proportions. This approach, often incorporating the

golden ratio, ensured that urban environments were tailored to human needs and scales.

- **Social Integration:**

Unlike earlier models that segregated social classes, Gothic towns mixed large and small plots within neighbourhoods. This mosaic of land use facilitated a diverse urban tapestry, where the wealthy lived alongside the less affluent, promoting a more integrated society.

- **Religious Centricity:**

The structuring of towns around main parishes and places of worship underscored the profound influence of religion on Gothic urbanism. This focus on religious centres served not only spiritual needs but also reinforced the communal bonds within the town.

- **Tools and Measurements:**

- **Quine and Measurement Standards:**

The quine, or builder's cane, represented five primary units of measurement (palm, empan, foot, and royal cubit), adhering to the Fibonacci sequence and a geometric progression based on the golden ratio ( $\Phi$ ). This sophisticated approach to measurement underscored the integration of mathematical precision in urban design.

- **The Golden Ratio ( $\Phi$ ):**

The application of the golden ratio (1.618) in town planning, especially in determining proportions within the urban fabric, highlighted the Gothic era's commitment to creating spaces that were both aesthetically pleasing and functionally sound.

- **Impact and Legacy:**

A significant portion of northern European towns, out of 4,000 surveyed north of the Rhine, nearly 3,000 were built or restructured according to Gothic planning principles. This widespread adoption attests to the enduring influence of Gothic urbanism in shaping the medieval landscape.

(Bony 1983; Frankl and Crossley 2000; Simson 1988; Wilson 2008)

### ➤ COUNTRY HOUSES PLANNING

At the same time (13th century), a revival of the geometric rationality characteristic of Roman urban planning emerged in southern Europe, notably in the south of France with the development of bastides. These new towns, often granted franchises to exempt them from duties and taxes, were typically established on cleared lands. They utilized the Hippodamean grid plan, facilitating the division of land into manageable parcels to attract settlers and encourage urban growth. The bastide model represented a blend of strategic planning and economic incentives, aiming to create organized, thriving communities in previously rural areas.

### ➤ SUMMARY OF THE MIDDLE AGES' URBAN MODEL IN EUROPE

The medieval town had a completely different character from the ancient town:

- Religious Influence:  
Urban planning revolved around Christianity, organizing towns around faith centres.
- Social Integration:  
Medieval cities blended social classes, breaking down feudal barriers and fostering unity.
- Geometric Complexity:  
Unlike the straight lines of ancient towns, medieval planning embraced varied and intricate designs, reflecting adaptability and the human scale.

#### ❖ RENAISSANCE'S AND MODERN PERIOD'S URBAN MODELS IN EUROPE

At the end of the Middle Ages, right after the Black Death (a Pandemic also known as Second Bubonic Plague) Europe entered the Renaissance around 1400 CE. Originating in Florence, the Renaissance heralded a period of profound cultural, artistic, and intellectual revival that spread across Europe. This era, coupled with the global influence exerted by European empires post-1492 (after the discovery of the Americas), marked the advent of the Modern Period, initiating significant changes in urban planning and architectural practices.

#### ➤ RENAISSANCE'S CITY RENOVATIONS AND PLANNING

The Renaissance redefined urban spaces as entities for thoughtful planning and global representation. The era sought to address the inadequacies of medieval towns, characterized by their winding lanes, with a return to the organized, strategic urban forms of ancient cities. This period witnessed:

- Revival of Geometric Urban Organization:  
Philosophers, artists, and architects debated the political and geometric structuring of cities, conceiving plans for ideal cities. Notably, Le Filarete's Sforzinda introduced the radioconcentric plan, emphasizing symmetry and advanced defensive systems to match contemporary military technologies.
- Introduction of Monumental Perspective:  
A significant innovation of the Renaissance was the use of monumental perspective, integrating straight streets and endpoint buildings into a cohesive visual axis. This represented a shift from the Middle Ages' theocentric spatial organization to a 'spectacle space' focused on visual harmony and grandeur.

Thus, the "contact space" produced by the Middle Ages, based on a theocentric vision, then began to be juxtaposed with a "spectacle space", based on the interplay of a large monument highlighted by a long perspectival axis (and vice versa). Renaissance urban planning manifested in two principal styles across Europe:

- Baroque Influence:

Notable in Rome under Pope Sixtus V and through Bernini's works, this style extended to France (Le Vau) and cities like Prague and Krakow, emphasizing dramatic, ornate designs and expansive urban visions.

- Classical Style:

Symbolized by the creation of royal squares such as Place Dauphine, Place des Vosges, Place Vendôme, and Place de la Concorde. These spaces epitomized the era's architectural ethos, combining grandeur with geometric precision.

(Johnson 2002; Murray 1997)

➤ **SUMMARY RENAISSANCE'S AND EARLIEST MODERN PERIOD'S CITY RENOVATIONS AND PLANNING**

From the Renaissance through the early modern era, urban design evolved through diverse practices, including:

- Selective Reorganization:

Cities like Rome, Paris, and Amsterdam underwent partial restructuring to improve functionality and aesthetics.

- Urban Extensions:

Nancy, London, and Bath expanded, incorporating new urban principles.

- Comprehensive Rebuilding:

Lisbon's large-scale reconstruction following the 1755 earthquake.

- New Town Creation:

Planned cities such as Richelieu, Versailles, Mannheim, and St. Petersburg emerged, showcasing the era's innovative urban planning concepts.

**END OF THE CLASS**

**4.2. Class 2: Modern and Contemporary Times – Groups Formation**

Scheduled for Wednesday, the 13th of March 2024, from 1:00 pm to 2:45 pm, at UTSEUS, Shanghai University. This session is structured into three parts, each lasting approximately 30 minutes with two 5-minute breaks in between.

**4.2.1. Class 2 - Part 1: Recapitulation of Class 1 and introduction to Haussmann and Cerda**

30 minutes class, continue to be supported with the timeline diagram, drawing on real-time at the board (as a space-time referential structure to contextualise the class content), and with a digital presentation of slides projected in parallel next to the board. Divided as follow:

4.2.1.1. Recapitulation of the first class

5 minutes highlights and key points from the first class.

4.2.1.2. Introduction to Greek and Roman models

25 minutes introduction divided as follow: 10 minutes for Eugene Haussmann's work in Paris; 10 minutes for Ildefonso Cerda's work in Barcelona; 5 minutes summary and conclusions.

4.2.1.3. Theoretical framework content of Haussmann's and Cerda's work

❖ GLOBAL URBAN PLANNING MODELS OF THE 19TH AND 20TH CENTURIES

The supremacy and Hegemony of the so call Western Empires of the 1800 CE towards today made the Urban planning of cities a homogeneous global phenomenon. The European cities underwent very rapid and significant phases of expansion during this period. According to Françoise Choay, there were three main trends in urban planning during this period. To these can be added the great town planners of the 19th century, who were to some extent pre-progressives.

➤ PRE-PROGRESSIVE URBAN PLANNERS:

Today the Pre-progressive (or pre-functionalist) urban planners still been recognized as the pioneer on this modern urban transformation: Haussman and Cerdà. Eugène Haussmann (1809-1891), prefect of the Seine from 1853-1870 and transformer of Paris, and Idelfonso Cerdà (1815 - 1876), transformer of Barcelona. Both are, to some extent, "pre-progressives".

▪ Haussmann's work on Paris

Under the direction of Baron Georges-Eugène Haussmann and commissioned by Napoleon III, Paris underwent transformative urban redevelopment in the mid-19th century. This grand project was marked by its practical application rather than being rooted in social critique or theoretical urban planning. Haussmann's renovation of Paris was characterized by several key strategies:

- **Comprehensive Approach:**  
Haussmann's vision encompassed the entire city, extending beyond the limitations of individual districts or streets. His efforts aimed to modernize Paris as a cohesive whole.
- **Topographical Integration:**  
The redesign took full advantage of Paris's natural topography, incorporating and enhancing the city's squares and parks as integral components of the urban landscape.
- **Self-Financing Mechanism:**  
A novel funding strategy allowed property owners to capitalize on the increased value brought by urban improvements. This initiative motivated private investment in the redevelopment process.
- **Hierarchical Road System:**  
Haussmann introduced an efficient and hierarchical road network that facilitated quick connections across different city areas, improving accessibility and traffic flow.

- **Ventilation and Green Spaces:**  
The plan included the strategic placement of parks, squares, alleys, and gardens to ensure proper city ventilation, contributing to the overall health and aesthetic appeal of the urban environment.
- **Wastewater Management:**  
The implementation of a comprehensive drainage system addressed the city's sanitation needs, significantly enhancing public health standards.
- **Artistic and Architectural Unity:**  
Haussmann's approach also had a strong aesthetic component, aiming to:
  - ◆ Position major monuments as focal points at the ends of significant avenues (e.g., the Opera, Arc de Triomphe).
  - ◆ Achieve a unified urban appearance through the consistent use of materials (Parisian stone, slate roofs, zinc) and homogeneous architectural styles.

(McAuliffe 2020; Pinkney 2019; Saalman 1971)

### ▪ Cerda's work on Barcelona

Ildefons Cerda's urban planning for Barcelona, known as the "Eixample" (extension), represented a pioneering approach to city design during the mid-19th century. Unlike Haussmann's transformative projects in Paris, Cerda's vision was focused on the city's expansion rather than its existing structure. His theoretical framework aimed to distil universal principles that could guide the systematic organization of urban environments. Cerda's plan for Barcelona introduced:

- **Hierarchical and Linear Road Network:**  
The plan included a meticulously organized street system featuring roads of 20 meters, coupled with broader avenues of 60 and 80 meters. This hierarchical arrangement facilitated efficient urban mobility and connectivity.
- **Innovative Residential Layouts:**  
By adopting an octagonal layout at crossroads, Cerda's design ensured ample sunlight in living spaces. The unique shape of intersections created square urban blocks with canted corners, optimizing light exposure and ventilation within residential areas.

Cerda's contributions to urban planning were not solely architectural but also deeply rooted in a holistic understanding of urban dynamics, emphasizing the importance of health, light, and social equity in city development.

(Frampton 2020; Marshall 2004)

### ▪ Summary of Hausmaan's Paris & Cerda's Barcelona

Hausmann's Paris and Cerdà's Barcelona represent monumental urban planning projects that, despite their differing approaches, share common objectives in modernizing and rationalizing urban spaces. Both projects:

- **Function Segregation:**  
Strategically divided urban functions to streamline city life, with distinct zones designated for residential, commercial, and recreational purposes.
- **Connectivity Enhancement:**  
Focused on improving communication routes, including the creation of hierarchical road systems that facilitated easier movement within and between urban areas.
- **Architectural and Urban Cohesion:**  
Aimed to homogenize architectural styles and urban layouts, establishing a visual and functional unity across the cityscape.
- **Infrastructure Modernization:**  
Equipped cities with contemporary infrastructure, addressing the needs of sanitation, transportation, and public utilities to support a growing urban population.

### 5 MINUTES BREAK

#### 4.2.2. Class 2 - Part 2: Introduction to other Modern Models and Contemporary Trends

30 minutes class, continue to be supported with the timeline diagram, drawing on real-time at the board (as a space-time referential structure to contextualise the class content), and with a digital presentation of slides projected in parallel next to the board. Divided as follow:

##### 4.2.2.1. Introduction to Modern and Contemporary models and trends

30 minutes introduction divided as follow: 10 minutes for progressist and functionalist urban planners and their ideas; 10 minutes for alternative trends such the Culturalist and Naturalist movement; 10 minutes for a critical overview of the 21<sup>st</sup> century urban current conditions, and challenges and opportunities for Urban Data Researchers.

##### 4.2.2.2. Theoretical framework content of Modern and Contemporary Urban Planning

#### ❖ THE PROGRESSIVE OR FUNCTIONALIST TREND

The 19th and 20th centuries witnessed a dominant urban planning movement known as the "progressive" or "functionalist" trend. This movement profoundly influenced the 20th century with its conceptual strength, doctrinal diversity, and international scope. It received official recognition in countries like France and evoked varied responses from the public. The fundamental goal of functionalist urban planning was to meticulously design cities to align with evolving operational



conditions, thereby creating functional, harmonious environments that catered to the modern, universal human needs. Key characteristics of this trend include:

- Zoning and Specialization:

Cities were divided into distinct zones for residential, work, and leisure activities. A comprehensive traffic network distinguished various lanes (expressways, feeder roads, pedestrian paths) to efficiently connect these specialized areas.

- Standardization and Modernization:

Urban space witnessed the introduction of standardized building types, incorporating modern forms, technologies, and materials. Traditional neighbourhood and street designs were eschewed in favour of modular units that could be flexibly integrated into both urban and rural settings.

- Automobile Emphasis and Geometric Efficiency:

The design favoured the automobile, with urban routes planned for both efficiency and aesthetic appeal. The traditional city fabric, characterized by street-aligned flats, was replaced by high-rise buildings set amidst green spaces, marking a departure from past urban forms.

- Futuristic Aesthetic:

By leveraging new construction technologies and materials (steel, concrete, glass), functionalist planners introduced a "futuristic" aesthetic that dictated housing typologies and the overall morphology of towns and cities.

- Universalist Ambition:

Viewed as a scientific endeavour, functionalist urban planning aimed to enhance individual well-being and the human condition at large. Planners sought to adapt and reconfigure cities in anticipation of future developments. Notable functionalist planners included Tony Garnier, with Brasília, redesigned by Oscar Niemeyer, standing as a quintessential example of functionalist city planning. Additionally, Washington D.C., planned by Pierre Charles L'Enfant, presaged functionalist principles.

(Benevolo 1980; Frampton 2020; Hall 2014; Le Corbusier 1986; 1991)

### ➤ THE CULTURALIST MOVEMENT

In response to the forward thrust of modernism, the "culturalist" movement emerged, championing an urban philosophy grounded in respect for historical continuity, particularly valuing the medieval urban heritage. This movement advocates for urban planning that is informed by comprehensive understanding of a city's demographic, geographical, social, and cultural contexts. Pioneered in the 19th century by thinkers like John Ruskin and William Morris, the culturalists critiqued the industrial society's urban paradigm for its disregard of aesthetic and spiritual values, proposing instead a revival of the medieval city's intricate streets and human-scaled towns as models for contemporary urban development.

Key Attributes of Culturalist Urban Planning:

- Preservation of Historical Boundaries:  
Emphasizes maintaining the city within its traditional limits.
  - Modest Scale:  
Draws inspiration from the manageable size of medieval cities, advocating for urban environments that foster community and human connection.
  - Rejection of Geometric Planning:  
Prefers irregularity, asymmetry, and sinuosity, celebrating the organic growth patterns of historical urban fabrics.
  - Diversity in Architecture:  
Opposes standardization, encouraging a rich variety in building designs and urban forms.
  - Integration of Art and Nature:  
Places equal importance on artistic expression and landscape within the urban setting, alongside functional considerations like hygiene.
- This movement also underscores the importance of conserving historic monuments and sites, a policy that gained momentum in the early 20th century. A quintessential example of culturalist urban planning is Ebenezer Howard's Garden City, which sought to harmonize residential communities with green spaces and industry in a self-contained city model.  
(Howard 1902; W. Morris 1995; Ruskin 2022)

➤ THE NATURALIST MOVEMENT

The naturalist movement represents the third major urban planning model of the twentieth century, originating as a minor trend primarily in North America. This model aimed to harmonize the industrial city with a society valuing individualism, family, and a deep connection to nature. Unlike previous models that focused on integrating nature within urban confines, the naturalist movement proposed developing urban areas within natural settings. This approach underpins the movement toward peri-urbanization observed in European cities, characterized by sprawling urban landscapes. Often referred to as de-urbanism, this trend challenges traditional urban forms, advocating for a dissolution of cities into the countryside to combat urban congestion exacerbated by automobile dependence.

- Key Principles of the Naturalist Movement:
  - City Dispersion:  
Advocated for the expansion of cities into large, vehicle-friendly areas, essentially the countryside, introducing a new scale of urban development—the metropolitan region.
  - Technological Connectivity:  
Relied on technology (telephones, automobiles) to maintain social and economic links within the dispersed city model.
  - Functional Segregation:

Proposed the separation of city centres as work hubs from suburban areas dedicated to housing and residential life.

Prominent proponents like Frank Lloyd Wright envisioned decentralizing cities to allow for the spread of naturalist cities within a new, dispersed urban land use system. This vision aimed to accommodate modern agrarian and democratic values within a metropolitan context.

- Influences on the urban planning in the 20th Century:

The naturalist movement influenced several urban development strategies, including:

- **Creation of New Towns:**

Varied from industrial towns, new capitals, and attempts to alleviate congestion in large cities through garden cities and new towns, to scientific cities.

- **Reconstruction Initiatives:**

Post-war or post-disaster rebuilding efforts that either restored towns to their original form or introduced new urban plans.

- **Comprehensive City Restructuring:**

Included projects like Haussmann's Paris reorganization and urban renewal initiatives, as well as planned expansions like the large housing estates post-WWII in France.

(Fishman 1997; Hall 2014; Wright 1955)

### ➤ GLOBAL 21TH CENTURY GLOBAL TRENDS

The 21st century heralds a new era for urban development, characterized by several global trends that are reshaping the landscape of cities worldwide. These include:

- Growing Urbanization:

The global trend points towards an increase in the size, number, and density of cities, particularly challenging for non-European countries due to varying economic and infrastructural capabilities.

- Complex Urban Diversity:

Cities are becoming increasingly complex with heightened economic, social, cultural, ethnic, and religious diversity. This complexity necessitates a more nuanced approach to urban planning to accommodate the myriad of stakeholders and scenarios.

- Environmental Challenges:

The concentration of human activity in urban areas is leading to increased pollution levels, necessitating innovative solutions to mitigate environmental impact.

- Technological Innovations:

The advent of new technologies is driving the differentiation of cities, offering new opportunities and challenges in urban development.

Urban areas are undergoing significant transformations due to societal shifts and the evolving role of transportation:

- Urban Sprawl:

The traditional urban continuum is giving way to extensive sprawl, as cities extend into rural areas, resulting in less dense and more fragmented urban forms.

- Functional and Social Specialization:

Cities are fragmenting into zones with distinct functional and social characteristics, reflecting the diversity of urban life.

The future of urban spaces will be shaped by emerging technologies and changing social dynamics:

- Densification and Greenification:

A movement towards denser, more sustainable urban environments is emerging, emphasizing:

- Reutilization of high-rise buildings and towers.
- Urbanization of previously neglected areas, including industrial and port zones, into residential spaces.
- Transformation of motorways into urban boulevards and car parks into green spaces.

- The Sustainable or Neo-Functionalist City:

This concept reimagines the city's relationship with nature, integrating green spaces not merely as aesthetic elements but as integral components of the urban ecosystem. Unlike the traditional functionalist city, the sustainable city envisions a harmonious coexistence with nature, embedding natural elements into the fabric of urban life.

(Gehl 2010; Harvey 2012; Register 2006)

#### **4.2.3. Class 2 – Part 3: Formation of student groups and introduction to homework assessment**

##### **4.2.3.1. Groups formation**

Students will self-divide into groups, encouraging a mix of cultural background and gender, mirroring the interdisciplinary nature of urban planning. The instructor will facilitate the formation of these groups, ensuring diversity and balance in each team. (Approx. 15 minutes)

##### **4.2.3.2. Overview of Homework Assessment**

Introduce to the homework group assessment, explaining its objectives, requirements, and evaluation criteria. This assignment is designed to apply the theoretical knowledge acquired in the course to practical urban planning challenges. Teams will be tasked to identifying key elements on cities today, current issues, together with one analysis of a chosen area in Shanghai, in which

they can provide, data-driven solutions to improve its liveability, sustainability, or experience. (Approx. 15 minutes)

### **END OF THE CLASS**

#### **4.3. Class 3: Urban Morphologies and Workshop Briefing**

Scheduled for Monday, the 18th of March 2024, from 1:00 pm to 2:45 pm, at UTSEUS, Shanghai University. This session is structured into three parts, each lasting approximately 30 minutes with two 5-minute breaks in between.

##### **4.3.1. Class 3 – Part 1: Recap and Introduction to urban morphologies**

###### **4.3.1.1. Recapitulation of the first two classes**

Highlights and key points from the first class. (Approx. 5 minutes)

###### **4.3.1.2. Introduction to Urban Morphologies and Workshop briefing**

Introduction to the concept of urban morphologies; introduction to the upcoming workshop; providing clarity of how urban morphologies will play an important role in the workshop's goals and expectations; conducting a Q&A session, and open forum for students to ask questions about clarifying any doubts regarding the relationship of urban morphologies and the upcoming workshop. (Approx. 25 minutes)

### **5 MINUTES BREAK**

##### **4.3.2. Class 3 – Part 2: Explorations of urban morphologies**

###### **4.3.2.1. Exploration of Urban Morphologies**

Presentation of Urban Morphologies utilizing digital slides and real-time board drawings, this segment presents various urban morphologies through history, highlighting their characteristics, development factors, and impacts on urban life. The examples will include traditional, colonial, industrial, and modern urban morphologies, providing a broad perspective on how cities have evolved. (Approx. 30 minutes)

### **5 MINUTES BREAK**

##### **4.3.3. Class 3 – Part 3: Conclusions of Cities' theoretical introduction**

###### **4.3.3.1. Conclusions of the theoretical introduction to cities**

This concluding segment of our third class will summarize the theoretical journey through urban development, from the earliest settlements to contemporary urban trends, and transition into the

practical application of these concepts in the upcoming workshop.  
(Approx. 15 minutes)

4.3.3.2. Q&A and Preparation for Workshop

Question and Answer Session. An open forum for students to ask questions about the course so far, clarifying any doubts regarding objectives, methods, and expectations. (Approx. 15 minutes)

**END OF THE CLASS**

**4.4. Class 4: Workshop on Shanghai Districts**

Planned for Tuesday, the 19th of April 2024, from 1:00 pm to 2:45 pm, this hands-on workshop session engages students in practical urban analysis and planning exercises.

**4.4.1. Workshop Introduction**

A brief of the workshop objectives and the importance of applying urban data science principles to real-world scenarios. Clarify the goals and expectations for the upcoming workshop, focusing on analysing and proposing improvements for Shanghai's districts through the eyes of urban data researchers. Each group receives a map of their district, tracing paper, and guidelines for conducting their analysis and making propositions. (Approx. 10 minutes)

**4.4.2. Group Work Session:**

In their groups, students use the maps and tracing paper provided to analyse their assigned Shanghai districts. They will identify key issues, opportunities, and areas for improvement, identifying: (1) environmental and humanistic factors, and (2) urban morphologies, in order to propose innovative solutions from the Urban Data Research point of view. (Approx. 90 minutes)

**4.4.3. Wrap-Up and Briefing for Presentation:**

Groups finalize their findings and proposals, preparing for the presentation in the next class. (Approx. 5 minutes)

**END OF THE CLASS**

**4.5. Class 5: Workshop Presentation and Course Conclusion**

Planned for Tuesday, the 19th of April 2024, from 1:00 pm to 2:45 pm, this hands-on workshop session engages students in practical urban analysis and planning exercises.

**4.5.1. Presentation protocols**

Briefing of how each group will presents their Shanghai district analysis and propositions. The presentations are conducted around the large, empty room floor, where maps are placed according to their geographical location in Shanghai, gradually forming a complete map of the city. (Approx. 5 minutes)

**4.5.2. Groups presentation**

Each group has 5 minutes to present their findings and proposals (approx. 70 minutes in total): After all presentations, an open discussion is facilitated to explore the interconnectedness of the proposed solutions across different districts, emphasizing the complexity and integrated nature of urban development. (Approx. 90 minutes)

**4.5.3. Course Conclusion:**

Summarize key learnings, reflect on the importance of urban data science in contemporary city planning, and thank students for their active participation and contributions. (Approx. 10 minutes)

**END OF THE COURSE**

## 5. EVALUATION SYSTEM

### 5.1. Homework Assessment:

Students are asked to be self-organized in teams, and each team is tasked with synthesizing crucial aspects of contemporary urban spaces and selecting a specific urban area in Shanghai as a case study. This should be illustrated through a one-page (A4 horizontal format) poster that includes both textual analysis and visual elements (maps and pictures).

#### 5.1.1. **Assessment's Evaluation Criteria:**

##### Analytical Depth:

The extent to which the group has identified and explored the significant aspects of modern cities, demonstrating a comprehensive understanding of urban complexities.

##### Creativity:

Originality in the approach to presenting the critical viewpoint on urban issues, including innovative use of design and visual communication in the poster.

##### Feasibility and Critical Positioning:

The practicality of the suggestions made for the chosen urban space in Shanghai and the effectiveness of the group's critical stance on urban development challenges.

##### Correlation with Case Study:

How well the general discussion on cities is tied to the specific Shanghai case study, showing a meaningful connection between theoretical insights and practical observations.

##### Presentation:

Clarity, coherence, and visual appeal of the poster, including the effective use of maps and images to support the analysis.

### 5.2. Workshop:

Organised in the same teams of the assessment, this hands-on session, tasked the students to analyse and to propose enhancements for assigned districts in Shanghai. The culmination of this workshop is a collective presentation that pieces together a comprehensive map of Shanghai, integrating each group's district proposals for a comparison analysis.

#### 5.2.1. **Workshop's Evaluation Criteria:**

##### Diagnostic Accuracy:

Precision in identifying the key urban challenges and opportunities within the assigned district, based on urban data science methodologies.

##### Innovative Solutions:

The creativity and originality of the proposed improvements, and how they address the diagnosed issues.



Collaborative Integration:

The ability of the group to work collaboratively in fitting their district proposal into the larger context of Shanghai, demonstrating an understanding of the interconnectedness of urban spaces.

Feasibility and Sustainability:

Realism of the proposed enhancements in terms of implementation potential and their sustainability from environmental, economic, and social perspectives.

Presentation and Communication:

Effectiveness in presenting the district proposal and its integration into the macro-map of Shanghai, including the clarity of the narrative, the quality of visual aids, and the ability to engage the audience.

Reflective Insight:

Depth of insight shown in the final discussion, particularly in understanding the complexity of city development and how district-level interventions contribute to the overall urban fabric of Shanghai.

## **6. METHODOLOGY**

- Interactive lectures using PowerPoint and board diagrams.
- Group discussions and collaborative projects.
- Hands-on workshop with real-life application of urban data science principles.

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