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## **CIV\_ENV 387 – Design of Sustainable Urban Developments**

Fall Quarter 2022

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This course will provide students with an overview of the theory and practice of Urban Design and the impact of selected architectural interventions that will serve as a catalyst to repairing the urban fabric.

The major emphasis of the semester will focus on a neighborhood adjacent to Ryan field with an emphasis on natural amenities, public parks, as well as mass transit. The goal is to design a sustainable, high performing urban plan that incorporates the principles of density, diversity, and flexibility. Sustainable urban districts are walkable and bikeable, diminishing the reliance on automobiles. These districts embrace the concept of resiliency and are ecologically regenerative, economically vibrant, and socially equitable. Sustainability is more than a reduction in environmental impact; it is rethinking the relationship between humans and nature.

A successful urban development also contains moments of surprise or wonder, focal points that serve as a catalyst to bring people together. It can be a park, civic or public building that can reinforce or establish an identity of a place or neighborhood. With the context of the developed master plan, students will have the opportunity to explore a feature component of the plan and develop its architectural language. Principles of sustainability, resiliency and design excellence should be applied.

The course will revolve primarily around a studio format with group and individual desk critiques serving as the core of our course. Studio work will be supplemented with lectures and presentations from the instructors, as well as other specialists within the local professional community. Course work will focus on team assignments with assessment of individual participation and contribution to work and discussions.

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## Weeks 1-3: Assignment #1 – Urban Design Case Studies:

Tasks: Research and document an urban development to discern how redevelopment projects use sustainable design to drive a project. Each student will pick a project from the list of international developments to compare and analyze. The goal is to build the students literacy of successful urban interventions and gain the understanding of what led to its success. The students will be required to document the original conditions, describe what the catalyst for development was, and present the final vision of how the project addressed the following issues:

1. Connectivity to the surrounding neighborhoods and community – restoration of the Urban Fabric
2. Transportation and mass transit
3. Natural amenities, such as open space and natural topography
4. Sustainability
  - a. Water
  - b. Energy
  - c. Waste
5. Resiliency
  - a. Design's adaptability to weather extremes due to climate change
    - i. Extreme temperature swings
    - ii. Flooding & drought
    - iii. Earthquakes
6. Presentation quality: How was the design graphically communicated
  - a. Preliminary sketches
  - b. Diagrams
  - c. Sections
  - d. Models
  - e. Renderings
7. Summarize the major impact of the interventions
8. Assess the cultural difference and typological differences of the two projects. Convey how they are influenced by the social and economic conditions of the region.
9. Analyze a portion of the project area and for dimensions and block organization strategies and hierarchy.
10. Map the site based on Kevin Lynch's 5 principles from Image of the City
11. Use google maps to compare the scale of your case study with the site area at Ryan Field

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## Projects

1. Transbay Neighborhood. San Francisco, California
2. LA Live, Staples Center, Pico Station. Los Angeles, California
3. Brooklyn Atlantic Terminal Neighborhood. Brooklyn, New York
4. Potsdamer Platz. Berlin, Germany
5. Almere Masterplan. Almere, Netherlands
6. Laurenskwartier District. Rotterdam, The Netherlands
7. Aker Brygge/Tjuvholmen. Oslo, Norway
8. Hafen City. Hamburg, Germany
9. Lincoln Yards, Chicago, Illinois
10. Eastern Docklands / Oostelijk Havengebied. Amsterdam, The Netherlands
11. Aarhus Ø, Aarhus, Jutland, Denmark, AART Architects
12. The 78, Chicago, Illinois

## Deliverable:

Each groups presentation will include the following:

1. Context map at multiple scales
2. Brief description of environmental context - climate and resiliency
3. Brief history of the site: Show existing conditions, pre master plan
4. Identify the existing site constraints and challenges and the goals of the project
5. Identify general program elements. (Sports and Rec, Commercial, Business District, Retail, Housing, ETC.)
6. Diagram the solution
  - a. Discuss general organizing principles
    - i. Centralized green space
    - ii. Urban grid
    - iii. Building Types
7. Graphic Representation of the finished project. (Renderings, photos)
8. Critique: Evaluate the areas of concern on the project. Identify the consequences of certain design strategies and why they may work in the project's environment but not in another. Relate it to a city you have experienced / grew up in.
9. Analyze a **14 acre area** of the project development area and document setbacks, streets, sidewalk edges, and different building scales / dimensions. Overlay the analyzed area to scale on the project sites for the semester. Use tools like google earth to get dimension information. Include street images from Google Earth of the area and present a brief walkthrough using the images to support your analysis.
10. Using Google, compare the scale of the case study to a city where you grew up.
11. Following Kevin Lynch's 5 ideas from Image of the City analyze your case study site area and its surroundings to identify Path, Edge, District, Node, and Icon.
12. Conclusion: Final thoughts on the overall success of the project

The presentation should be limited to 7 to 10 min. using a maximum of **30 slides**.

**Due Monday 10/3/22**

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## Weeks 4-7: Assignment #2 – Mid Term Master Plan Concepts

Problem: What is the goal of the masterplan?

Tasks: The site provides numerous opportunities for improving a variety of conditions both local to the site as well as those that impact its greater surrounding. Utilizing knowledge gained from the case studies, students should leverage their understanding of the site and its zoning implications, as well as the successes and failures of historical precedents to consider and prioritize some of the possibilities of urban planning, including, but not limited to the following issues.

Your team of **(2)** will develop the site using your case study's from assignment 1 as a springboard. Each team will analyze the site and support their findings with numbers, drawings, and diagrams. Using this information each team will present 1 design concept to the class. Each concept is meant to focus on an area of interest with a simple design narrative to support the idea using plans, sections, diagrams, or physical models. Below is a general outline of things to look at for your site area. Teams are encouraged to share their general analysis, common elements such as traffic, transit, jobs, etc. can be shared.

- Concept – What is the big narrative or program idea you want to explore? How will it drive the design of your development?
- Community – how can a scheme create, reinforce, or improve a community?
- Sustainability – how can a scheme help minimize energy consumption, reduce loads on storm and water infrastructure, and help improve the water quality of the neighborhood?
- Resiliency – how can a scheme help minimize the impact to the site from disasters and the changing climate?
- Traffic and congestion – how can a scheme deal with the potential added capacity of residents, workers, or visitors in an already congested area?
- Transit, Connectivity, Bicycling – how can a scheme promote shared transportation options, as well as healthy lifestyles by altering or reinforcing the existing condition?
- Open space – how can a scheme provide and utilize open space to encourage interaction, play and healthy living?
- Jobs – can a scheme provide significant opportunities to create jobs and, if so, which kinds are intended and why?
- Diversity – how can a scheme promote diversity of uses to enhance vibrant 24-hour lifestyles in the community and how are the transitions between diverse programs dealt with?
- Scale, density – How can the scale and density of a scheme work independently as well as impact its adjacent vicinity?
- Compatibility- How can a scheme impact its adjacent vicinity?

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Observations and photographs of contextual elements and project site conditions gathered from previous site visit may be useful in supporting your analysis.

Each team will present a brief analysis of the site collectively. Individual team members will then present a design scheme based on their key take aways from the site, reinforcing a sustainable design concept that they are interested in. Use narrative tools to pitch each design option clearly and succinctly.

Deliverable:

Analysis:

- Provide diagrams analyzing the site area, based on the categories listed above. Reinforce this information with analysis of major site elements in addition to site history. Examples of elements to diagram...
  - Streets, Transit, Pedestrian and Vehicle Circulation
  - Utilities and Infrastructure
  - Buildings and Uses
  - Natural Amenities
  - Adjacent Conditions
  - Views and Connections
  - Microclimate and Macroclimate Conditions
  - Scale Comparison of site to similar areas
  - Implications of gentrification
  - Use intensity of the area
  - Radial Walk Diagram
  - Pervious vs. Impervious surfaces

Students will slowly develop their concepts based on weekly milestones starting week 4. Each week will have an assignment paired with a lecture, slowly building design concepts until finally presenting the combined schemes on **10/32/22**.

### **Assignment 2.1 - Urban Developments: Blocks, Streets, Setbacks Due Monday 10/17/22**

Explore ideation of street and block organization within the site area. Referencing our lecture and discussion, choose and test 2 different block sizes (1 per person on the team) and explore street network and organization within the site boundary.

### **Assignment 2.2 – Public Spaces Due Monday 10/24/22**

Explore ideation of public spaces within the site area. Referencing our lecture and discussion, choose and test 2 different landscape/public realm strategies within the site area through simple diagrams (1

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per person on the team). Use precedent images to support the character and intent of your landscape design and public spaces.

## **Assignment 2.3 – Architecture Due Monday 10/31/22**

Explore ideation of building massing within the site area. Referencing our lecture and discussion, choose and test 2 different building scale organizations within the site area through simple extruded masses or sketches. Also consider where you are placing your major building types and what the overall program strategy is. (1 per person on the team). Use precedent images to support the character and intent of your architecture styles.

### Concepts:

- Develop one masterplan concepts per team member and describe the driving ideas using plans, sections, diagrams, or models (physical or digital). Diagrams are left at the discretion of each student. Use whatever you think will best express your big idea. Supplement with images from existing projects to convey the details of your design intent. Students are encouraged to explore ideas that they are passionate about, reinforcing them with the site analysis.
- Using your case study, occupy the 14 acres on the north side of the site with buildings and amenities to understand scale.
- Examples of Site Overlay Diagrams
  - Pedestrian circulation
  - Vehicular and service circulation
  - Program distribution
  - Open space definition
  - Sustainable strategies for the following:
    - Water, Permeability
    - Shadow study
- Establish parcel areas and streets to be occupied with building footprints. Use your case study to help inform scale and development for consistency throughout the plan.
- 4-8 minute elevator pitch presentation

### **Midterm Presentation**

Using the process and sketches generated from assignment 2.1-2.3, assemble a presentation to pitch your design concepts for the site to the class.

**Midterm Presentations Due Monday 10/31/22**

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## Weeks 8-11: Assignment #3 – Final Presentations - Masterplan Design and Development

Problem: Develop the site in teams of **(4)** using design concepts from assignment 2 with a higher level of detail.

Scope to include:

- Streets (primary and secondary): How is your design addressing vehicular movement and pedestrian flow? Provide street sections to illustrate important relationships and an understanding of urban scale.
- Sustainability initiative diagrams.
- Buildings: How are your built forms enhancing the urban experience? How do they not only provide places for living, business or entertainment but also create exterior spaces?
- Public Spaces: How are you utilizing “green” space? How are you framing views and enhancing the space between buildings?

**Riverwalk / Riverfront** project, focusing on exploring the following issues

- Riverfront Development
- Ecological Improvement
- Water Quality Improvement
- Pedestrian Engagement of Division and Halstead
- Connecting and Integrating the Riverfront Trail into the Surrounding Development
- 400 subsidized living units accounted for in the final plan
- Achieve a combined FAR of 5 across your total site area

**Transit Oriented Development** focusing on the following issues

- Relocation of the Clark/Division Station and the Implications of a Transit Oriented Development on Surrounding Neighborhood
- Centralizing Density and Managing Vehicle and Pedestrian Movement around Transit Center
- Runoff Storage and Grey Water Management
- Scale and Engagement of Open Space
- Pedestrian Experience on Division
- 150 subsidized living units accounted for in the final plan
- Achieve a combined FAR of 7

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## Assignment 3.1 - Narrative Design Concepts

Following the lecture, teams will pair up to form a group of **(4)**. Each team will discuss design ideas from assignment 2, and begin to form an overarching idea or narrative to bring the concepts explored into one driving design idea.

**Due Monday 11/14/22**

Each Team will assign a member to a focus area following the midterm. All team members will be responsible for developing the overall design, including architecture, façade development, public realm, and sustainability relative to their focus area.

Focus areas:

### Transportation

- Street Network and Street Section Development
- Sidewalk and Public Space Development
- Solutions for Access and Pedestrian Safety for Division

### Water Management, Environment, and Ecology

- Biodiversity and Wildlife strategies
- Defining water management strategy and how you will manage irrigation and conservation of onsite water use
- How can the district use its infrastructure to be resilient to natural and man-made events?

### Density and Program Mixes

- Define and Maintain FAR Metrics for Building Programming
- Making this an accessible place for all people and economic classes
- Approach for mixed-income housing. How to make this development a socially diverse and inclusive district.

Teams are encouraged to work with one team of the opposite site to share content and develop a larger connected vision between each Site A and Site B.

Final Deliverables for Team Presentations on December 06:

One full bleed image per 11x17



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2-minute presentation for orienting mid-term concepts:

Use the content from your mid-term scheme presentations and case studies.

- Diagrams
- Masterplan
- Consolidated site analysis
- A correlation diagram between your scheme and how your case study informed the design.
- At the end identify the takeaway from your midterm design that translated to the final group scheme.

20-minute team presentation

- Diagrams
- Masterplan
- Site Plan
- Sections
- Sustainable initiatives
- Physical Model
- Consolidated site analysis
- Precedent Images (limited)
- 3d Views
- 3D Land Use
- Open Space Diagram
- List of Principals
- Transportation Diagram
- Concept Diagram and Title
- Sustainability goals
- Sustainability processes diagrammed
- Kevin Lynch image of the city diagram of site before and after
- Overall program intent from assignment 2 and how it adapted

Presentations to be broken into timed segments 45 minutes per team:

- 20 minutes for team presentation
  - o 5 minutes of speaking time (approx. per person)
- 20 minutes of question and answer

**Full Assignment \*Due Thursday 12/8/22 - (Tentative)**

**\*Specific drawings such as sections, plans, and diagrams will be assigned each week during this time with a graded value. Content will count toward final presentation and final grade will reflect revisions made as design schemes are further developed. Final grade for group work and individual assignments will be assessed for final grade.**

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## Grade Breakdowns

**Assignment 1: 20 Points**

**Assignment 2 Total: 45 points**

- **Assignment 2.1:** 10 Points
- **Assignment 2.2:** 10 Points
- **Assignment 2.3:** 10 Points
- **Midterm Presentation and Organization of Concepts:** 15 Points

**Assignment 3 Total: 70 points**

- **Assignment 3.1:** 10 Points
- **Final Presentation, Development, and Organization of Concepts:** 60 Points

**Class Participation and Discussion: 15 Points**

**Pinups and Preparation: 15 Points**

Attendance is treated as reductive. First absence is free, every additional unexcused absence will cost up to a 2% reduction in final grade per instance. In the event that you test positive for Covid-19, please notify the instructors.

## Resources

### Communication

- Canvas
- Email
- Slack

### Adobe Creative Software

<https://www.adobe.com/creativecloud/buy/students.html>

- Adobe Photoshop
- Adobe Illustrator

### Revit

<https://www.autodesk.com/education/free-software/revit>

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## Rhino

<https://www.rhino3d.com/download>

You can get a free 90-day trial which should last the duration of the course. It serves a similar purpose to Revit, just with more freedom to design. Modeling done in this software can be imported to Revit. It is good for creating more unusual shapes. I normally use this as a supplemental tool to Revit.

## Lumion

<https://lumion.com/educational-licenses-us.html>

I highly encourage everyone with capable setups to get a student version. This software will be useful toward the backend of the course, especially for Assignment 2 and beyond. The downside is that it is graphically intensive so I wouldn't recommend downloading it unless your computer has a dedicated graphics card. It is incredibly helpful for making images that sell your design ideas. There are libraries of people, trees, objects, and much more that you can use to populate your projects and really immerse people during your presentations. The computers in the class space have recently had this software installed if you cannot access it on your PC.

## Drawing Materials

- Sign Pen package:

[https://www.amazon.com/Pentel-Felt-Assorted-Colors-S520-12/dp/B00006IFJK/ref=sr\\_1\\_2?dchild=1&keywords=Pentel+S520+Assorted+Pack+Sign&qid=1599235062&s=office-products&sr=1-2](https://www.amazon.com/Pentel-Felt-Assorted-Colors-S520-12/dp/B00006IFJK/ref=sr_1_2?dchild=1&keywords=Pentel+S520+Assorted+Pack+Sign&qid=1599235062&s=office-products&sr=1-2)

- Engineer Scale:

[https://www.amazon.com/Alvin-241P-Plastic-Engineer-Triangular/dp/B0058UE2TC/ref=sr\\_1\\_1?dchild=1&keywords=alvin+241p+12%22+high+impact+plastic+engineer&qid=1599235152&s=office-products&sr=1-1](https://www.amazon.com/Alvin-241P-Plastic-Engineer-Triangular/dp/B0058UE2TC/ref=sr_1_1?dchild=1&keywords=alvin+241p+12%22+high+impact+plastic+engineer&qid=1599235152&s=office-products&sr=1-1)

- Tracing Paper (roll):

[https://www.amazon.com/Alvin-Lightweight-Tracing-inches-55W-G/dp/B0055Q16TI/ref=sr\\_1\\_17?dchild=1&keywords=Alvin%2C+Lightweight+White+Tracing+Paper+Rolls&qid=1599235364&refinements=p\\_89%3AALVIN%2Cp\\_36%3A2638326011&rnid=2638325011&s=arts-crafts&sr=1-17](https://www.amazon.com/Alvin-Lightweight-Tracing-inches-55W-G/dp/B0055Q16TI/ref=sr_1_17?dchild=1&keywords=Alvin%2C+Lightweight+White+Tracing+Paper+Rolls&qid=1599235364&refinements=p_89%3AALVIN%2Cp_36%3A2638326011&rnid=2638325011&s=arts-crafts&sr=1-17)

- Drafting Dots (optional, but suggested):

[https://www.amazon.com/Mr-Drafting-Supplies-Architectural-Stationary/dp/B07F1TX7CC/ref=sr\\_1\\_2\\_sspa?dchild=1&keywords=drafting+dots&qid=1599235428&sr=8-2-](https://www.amazon.com/Mr-Drafting-Supplies-Architectural-Stationary/dp/B07F1TX7CC/ref=sr_1_2_sspa?dchild=1&keywords=drafting+dots&qid=1599235428&sr=8-2-)

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- Tracing Paper (14x17 pad) (optional):  
[https://www.amazon.com/dp/B0027A76BM/ref=twister\\_B08435NX7W?encoding=UTF8&th=1](https://www.amazon.com/dp/B0027A76BM/ref=twister_B08435NX7W?encoding=UTF8&th=1)

- Highlighter pack (optional):  
[https://www.amazon.com/Sharpie-27145-Highlighters-Assorted-12-Count/dp/B002BA5WMI/ref=sr\\_1\\_8?dchild=1&keywords=highlighter+pack&qid=1599234960&s=office-products&sr=1-8](https://www.amazon.com/Sharpie-27145-Highlighters-Assorted-12-Count/dp/B002BA5WMI/ref=sr_1_8?dchild=1&keywords=highlighter+pack&qid=1599234960&s=office-products&sr=1-8)