

Sustainable Cities and Urban Ecologies

Into which MS degree will this Graduate Certificate convert?

This certificate can lead into the current MS Arch degree or M Arch degree. Students may also take the courses of the certificate as elective courses and apply them for both, the certificate and their M Arch degree. We are also in the process to restructure the MIP (Master of Infrastructure Planning) degree and rename it Master of Urban Design. Once this degree is available, this certificate can also lead towards the latter degree.

In what industries might a holder of this Graduate Certificate find employment?

Especially large architecture firms operate at the urban scale. This certificate provides a better understanding of systems that operate at an urban scale that usually falls short in a typical professional architecture education. It also attracts professionals in the architecture and planning industry that want to update their skillset with cutting-edge tools, techniques and methods in the field of urban design.

In what job titles might a holder of this Certificate fit?

Architect, Urban Designer, Urban Planner, Real Estate Developer

Description of certificate program

Cities are ecological systems that are defined by social, economic, cultural and political processes. A better understanding of these ecologies is necessary in order to steer the direction of urban design and development in order to respond to climate change, inequality and a digital lifestyle. This certificate will introduce you to tools such as GIS and other technologies to monitor the environmental impact and methods to operate at the scale of urban ecological systems. You will learn about master planning, community engagement, zoning and land use. You will also gain an insight into a contemporary and historic perspective of public space, housing, development, redevelopment and re-use.

The 12-credit Graduate Certificate in **Sustainable Cities and Urban Ecologies** is comprised of four courses for those who wish to gain the foundational skills and knowledge to operate as an Architect and Designer at an urban scale.

What are the Required Courses?

Students have to select four courses from the following list:

ARCH 636 History and Theory of Urban Planning and Design

3 credits, 3 contact hours

The course examines methods for conducting historically driven, interdisciplinary research on the built environment (with a focus on cities and suburbs) through the lens of architecture, landscape, geography, and material culture. Methodology is studied to inform the production of urban history and to frame historical perspectives on contemporary urban issues. Historiography and critical theory are key aspects of the study of urban history's methodologies. In addition to traditional historical methodologies, the course examines emerging digital humanities methodologies.

ARCH 647 Visualizing Urbanism

3 credits, 3 contact hours

Evaluation and use of computer graphics hardware and software for architectural applications. Focus is on computers as tools, operating systems and methods of data manipulation. Two- and three-dimensional modeling software are discussed, and assignments using such software are given to provide understanding of the modeling of built environments.

ARCH 651 Public and Private Development

3 credits, 3 contact hours

Introduction to the economic, financial and political aspects of real estate and their effect on architectural decision-making. Topics include: needs assessment, real estate appraisal, financial instruments, regulations and real estate, design as value-adding, and the effect of tax policies on real estate development. This course is required for the dual degree M.Arch./MS in Management program. It can also be used as an elective in the M.Arch. program.

ARCH 655 Land Use Planning

3 credits, 3 contact hours

Planning Spatial relations of human behavior patterns to land use: methods of employment and population studies are evaluated; location and spatial requirements are related to land use plans; and concepts of urban renewal and recreational planning are investigated by case studies. Same as TRAN 655 and CE 655.

ARCH 677 Geographic Information Systems

3 credits, 3 contact hours

Prerequisite: course or working knowledge of CADD or permission of instructor. Geographical/Land Information System (GIS/LIS) is a computerized system capable of storing, manipulating and using spatial data describing location and significant properties of the earth's surface. GIS is an interdisciplinary technology used for studying and managing land uses, land resource assessment, environmental monitoring and hazard/toxic waste control, etc. Introduces this emerging technology and its applications.

ARCH 684 Topics of Sustainable Urbanism

3 credits, 3 contact hours

Cities are growing at an unprecedented speed. Cities currently account for about 70 percent of global carbon emissions and over 60 per cent of resource use. We have to develop a vision for more sustainable cities and new protocols and processes to implement more sustainable vision for urban areas. This course will provide an inside into challenges we face (growing number of slum dwellers, inadequate infrastructure and services) and on solutions to address them.

ARCH 688 The Augmented City

3 credits, 3 contact hours

Digital technology disrupted city life. The use of ICTs (Information Communication Technologies) has radically changed the way we inhabit and operate in the urban space. This course provides a history of how information technology is used to influence and support social structures and an inside in how ICTs are used as a catalytic tool for expanding, augmenting and altering social interactions.

FIN 600 Corporate Finance I

3 credits, 3 contact hours

This course introduces concepts and analytical tools to identify and solve Financial Management problems. After introducing the corporation, the course focuses on how firms invest in real assets (capital budgeting) and how they raise money to pay for assets (financing). Practical problems in valuing bonds, stocks and other investments will be based on the time value of money. The trade-off between risk and return will be introduced with the Capital Asset Pricing Model.

FIN 611 Intro to Topics in Fin Tech

3 credits, 3 contact hours

The financial services industry is presently undergoing dramatic changes as recent technological advances have enabled the automation of former workflows. This course will survey current trends in the Financial Technology (FinTech) industry. Students will have the opportunity to develop their own software related to FinTech ideas discussed during this course.