

SUSTAINABLE URBAN DESIGN & ENGINEERING COURSE MODULES

With a global shift towards more eco-friendly cities, you could be the next architect or civil engineer to help shape Singapore's future landscape, while improving the quality of urban living. Get a step closer to turning dreams into reality with the Diploma in Sustainable Urban Design & Engineering [SDE]!

In the foundation year, you will be immersed in studio-based learning, picking up conceptual thinking, drawing and modelling skills. You will also develop an appreciation of urban planning, building systems, structures and sustainable design to allow an integrated approach in architecture and civil engineering.

You will cultivate an understanding of the intersection of architecture and civil engineering with a view to specialise in either field in the second year.

Architecture Specialisation

Investigate, experiment and explore with different aspects of the architectural design considerations from the conceptual to contextual, physical, social and cultural perspectives through a series of small to large scale design projects. You will be committed to architectural design studio classes to steer your acumen towards creative thinking, to enhance your knowledge on spatial and experiential planning, architectural formation and sustainable design.

You will develop critical design solutions with compliance to statutory requirements for architecture and urban interventions.

Civil Engineering Specialisation

Learn about current Code of Practice for the analysis and design of structural elements in reinforced concrete structures, steel structures and detailed design of various structural elements. Embark on local and overseas study trips to deepen your structural and civil engineering design capabilities as well as the design of eco-friendly buildings. Develop comprehensive awareness of industry trends shared by guest speakers from the industry.

You will explore the latest technologies in Building Information Modelling to produce sustainable architectural and engineering solutions. You will also get a chance to attend off-campus learning as well as to explore through study trips to world renowned architectural festivals, sustainable cities and heritage sites.

Finally, you will round off your third year with a six-month internship, or a three-month internship with final year project to apply what you have learnt in the real world.

ARCHITECTURE SPECIALISATION LEVEL 3.1

Architectural Materials & Technology 2

This module enhances students' understanding with more advanced construction, building technologies, steel structural systems, façade cladding systems and materials applicable to large scale projects. It also covers sustainable construction such as green roofs and walls. Students are required to apply their knowledge through the analysis of large scale buildings and to integrate functional assemblage, architectural enclosure and structural system into their design projects in a cohesive manner.

Design Studio 3

This module enhances the level of the design skills with the considerations for spatial adaptability and sustainability considerations in an urban context. Students are to explore different aspects of the architectural design considerations from the contextual, physical, social and cultural perspectives. Students will develop interpretive analysis, and conceptual and critical thinking to formulate the design narratives and to orchestrate spatial and experiential sequence through creative exploration and creation of form, space, and programme. Students will develop critical design solutions with compliance to statutory requirements for small to large scale architectures and urban interventions.

History & Theory of Asian Architecture

As a follow-on module from History & Theory of Western Architecture, this module focuses on the Asian and local perspectives of architectural history and theory. Through visits, discussions and critiques of significant architectural works, architects and their influences are studied. Students will appreciate the development of architectural ideas and built works in the Asian and local contexts, and their relationship with the prevailing society and culture. Local urban conservation and refurbishment projects will be covered.

Professional Practice

This module places architectural design in the context of a professional practice. Students will learn how an architectural

practice is organised, the roles and responsibilities of architects, and their relationships with the other consultants and professionals of a building project team. The module will provide students the knowledge of the regulatory and discretionary building codes and standards that any architectural design in Singapore must conform to and correspondingly, the standard procedures for project application to the relevant authorities. Students are to apply relevant guidelines to their design projects.

LEVEL 3.2

3-Month Internship

The module provides students with the opportunity to gain experience and apply the knowledge and skills learnt in a working environment relevant to the course. Students will enhance their abilities in problem solving, communication and interpersonal skills in the module. The internship may be conducted locally or overseas. Students are required to submit weekly reports, interim and final reports, and present the internship experiences in an oral presentation at the end of the internship.

Design Studio 4

In this final-year project, students will develop architectural design projects from inception to completion in a succinct manner. Through the study of architectural precedents and site analysis, students' design proposals should demonstrate a keen understanding of context, environment and spatial programming as well as sensitivity to materials techniques and skills to bring out the essence of their design through the use of various representational media to communicate design ideas effectively. The meaning of a space in relation to its function and human activities is also demonstrated against social and cultural aspects.

Project Management

This module covers the principles of project management at various stages of a building and construction project. Elements of contract administration, quality management, coordination, engineering economics and finance will be taught.

CIVIL ENGINEERING SPECIALISATION

LEVEL 3.1

Project Management

This module introduces students to the rudiments of modern construction project management. The module covers the principles of Project Management in the construction business at the various stages of planning. Elements of contract administration, construction and engineering economics and finance will be taught.

Soil Mechanics & Foundation Engineering

Students will study the behaviour of soil under structural loading. The properties of common types of soil, soil compaction, soil permeability, shear strength of soil, earth pressure and stability of slopes are covered in detail. Students will also learn about soil investigation, analysis of soil samples, and shallow and piled foundations to support intended structures.

Structural Assessment & Improvement

This module introduces the requirements of mandatory building inspection under the local Building Control Act. It covers the inspection of existing reinforced concrete structures, concrete defects, structural and non-structural cracks, non-destructive tests and repair works. Students will be given practical sessions in the use of equipment for non-destructive testing of concrete. The module also covers the process of building condition survey in preparation for conservation and refurbishment projects.

Structural Design 2

The topics in this module cover the design concepts of steel structures and detailed design of various structural steel elements based on the provisions of the structural steel design code. Students will also be taught how to prepare structural steel detailing and drawings.

Water Reclamation Technology

The module provides students with the fundamental principles of wastewater management. Students will be taught the design and operation of recycling technologies applied in water reclamation plants. The module also covers reclaimed water re-uses and applications as well as pumped and piped systems for collection of used water. There is focus on a planning and design approach to integrate the urban water cycle, including wastewater management into urban design.

LEVEL 3.2

OPTION 1

6-Month Internship

The module provides students the opportunity to gain experience and apply the knowledge and skills learnt in a working environment relevant to the course. Students will enhance their abilities in problem solving, communication and interpersonal skills in the module. The internship may be conducted locally or overseas, depending on the availability of internship companies. Students are required to submit weekly reports, interim and final reports, and present the internship experiences in an oral presentation at the end of the internship.

OPTION 2

3-Month Internship

The module provides students with the opportunity to gain experience and apply the knowledge and skills learnt in a working environment relevant to the course. Students will enhance their abilities in problem solving, communication and interpersonal skills in the module. The internship may be conducted locally or overseas. Students are required to submit weekly reports, interim and final reports, and present the internship experiences in an oral presentation at the end of the internship.

Final-Year Project

This module will allow the students to apply and integrate their knowledge and skills learnt in the first five semesters in solving a practical problem or study a given issue related to Civil Engineering. The project may be proposed by industry, staff or students themselves.

COURSE CURRICULUM

Module Name	Credit Units
YEAR 3	
ARCHITECTURE SPECIALISATION	
Level 3.1 (23 hours per week)	
Architectural Materials & Technology 2	3
Design Studio 3	10
History & Theory of Asian Architecture	3
Professional Practice	3
Interdisciplinary Studies (IS) elective ^	2
World Issues: A Singapore Perspective ^	2
Level 3.2 (26 hours per week)	
3-Month Internship	12
Design Studio 4	10
Project Management	4
CIVIL ENGINEERING SPECIALISATION	
Level 3.1 (28 hours per week)	
Project Management	4
Soil Mechanics & Foundation Engineering	5
Structural Assessment & Improvement	4
Structural Design 2	6
Water Reclamation Technology	5
Interdisciplinary Studies (IS) elective ^	2
World Issues: A Singapore Perspective ^	2
Level 3.2 (22 hours per week)	
6-Month Internship	22
OR	
3-Month Internship	12
Final Year Project	10

Notes:

^ For more details on Interdisciplinary Studies (IS) electives, please log on to www.np.edu.sg/is/

IS Modules

The School of Interdisciplinary Studies (IS) delivers a broad-based curriculum, which nurtures a new generation of professionals with multidisciplinary skills and an innovative and entrepreneurial spirit to meet the challenges of a knowledge economy. IS offers both prescribed modules and electives to challenge boundaries. Prescribed modules develop students' competencies in core areas such as Communication, Innovation and Enterprise, Culture and Communication, and Personal Mastery and Development, while elective modules provide insights into Arts and Humanities, Business, Design, and Science and Technology.