Built Environment

SUSD0016
Sustainable Infrastructure

Dr Sarath Mataraarachchi

3+ Abbreviated Course Outline – T1

Disclaimer
This abbreviated course outline is indicative of the outcomes, delivery and assessment. While Course Learning Outcomes will remain constant, other details may be subject to change. The full and most accurate course outline will be available in Moodle.

1. COURSE STAFF

Course Convenor	Dr Sarath Mataraarachchi
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2. COURSE DETAILS

Credit Points: 6 UoC

Learning Activity	Hours Total
Lecture	16
Tutorial	12
Online learning activity	8

Description

This course provides foundation knowledge for planning and managing sustainable infrastructure and public services. By infrastructure we mean built facilities and networks – either above or below ground – that support health, safety, and welfare. This is a broad take that traditionally has included publicly- and privately-owned providers of systems such as:

Utilities – gas and electricity, water supply and sewerage, waste collection and disposal

Public Works – roads and bridges, dams and canals, ports and airports, railways

Community Facilities – prisons, schools, parks, recreation, hospitals, libraries

Telecommunications - telephony, internet, television, satellites, cable, broadband, etc.

Public services in this context refers to public or social programs designed to benefit a class or classes of citizens, including health care, housing, workfare, education etc. This course prepares students to be proficient in a life-cycle method of infrastructure planning and management, which starts with a needs assessment, and encompasses programming, planning, design, costing, budgeting, financing, operations, maintenance, rehabilitation, replacement/redesign, and evaluation. We will also cover selected infrastructure and service systems, to be selected by the professor in consultation with the students, in order to best meet their interests. These typically include transport, public health, water, sewage treatment, energy, and telecoms. This course provides professionals and researchers with the theory and the tools needed to perform basic infrastructure planning and research. This course is designed to provide a basis for life-long inquiry into infrastructure. It is for students of urban planning, urban design, landscape architecture, architecture, property development, civil and environmental engineering, public health, and public administration.

Students enrolled into SUSD0016 also receive training to become an accredited professional of Infrastructure Sustainability Council of Australia (ISCA) . The cost for this training will be included in the cost of the course (i.e. no additional cost). Students who successfully complete this course can become Accredited Professionals to perform sustainability assessments on infrastructure projects. Students can sit

for the exam to become an Infrastructure Sustainability Accredited Professional (ISAP) by paying a discounted fee ($100). Students will also receive the IS Technical Manual as part of this training.

Program Learning Outcomes (PLOs)

1. Advanced disciplinary knowledge and practices - Graduates will have acquired advanced disciplinary knowledge and skills, and an ability to apply these in a range of contexts.
2. Enquiry-based learning - Graduates will have developed an understanding of enquiry-based learning and demonstrate analytical skills
3. Cognitive skills and critical thinking - Graduates will have developed advanced critical thinking and problem solving skills.
4. Communication, adaptive and interactional skills - Graduates will be able to communicate effectively to a range of audiences, and be capable of independent and collaborative enquiry and working effectively with others.
5. Global outlook - Graduates will have an awareness of international issues within their field of study.

Course Learning Outcomes (CLOs) with Alignment to PLOs and Assessment

CLO #	CLO Statement	PLO #	Related Assessment
CLO 1	Identify infrastructure planning as a key approach to planning and urban development leadership.	1, 5	Assignment 1 Assignment 2 Assignment 3 Assignment 4
CLO2	Describe infrastructure networks and recognise the significance of infrastructure provision as a defining function of, and framework for, the planning, designing, and building of cities and metropolitan areas.	1, 2, 3, 5	Assignment 1 Assignment 4
CLO 3	Explain how infrastructure is absolutely critical to the sustainability of cities.	2, 3, 5	Assignment 2
CLO 4	Be able to articulate and understand the infrastructure life cycle thinking, and how it leads to sustainable infrastructure.	3, 4	Assignment 1 Assignment 2 Assignment 4
CLO 5	Critically appreciate the roles of government, private sector, and other agents in infrastructure development processes.	1, 5, 4	Assignment 3 Assignment 4
CLO 6	Have the ability to provide advice on planning and designing sustainable infrastructure networks for the built environment.	1, 4	Assignment 2 Assignment 4

3. ASSESSMENT

Assessment Task	Weight	Course Learning Outcomes Assessed	Due Date
1. Assignment 1	5%	1	22/02/2019
2. Assignment 2	35%	1, 2, 3, 4, 5, 6	23/03/2019
3. Assignment 3	25%	3, 6	03/05/2019
4. Assignment 4	35%	1, 2, 3, 4, 5, 6	05/05/2019

4. WEEKLY COURSE SCHEDULE

Week	Topic	Activity	Related CLO
1	• Introduction to sustainable infrastructure • The players in the infrastructure market in Australia • Partners in Infrastructure Provision in Australia	• Short video lectures • Lessons in Slide format • Q&A session on Video • Relevant Youtube videos • Reading • Quizzes	1, 2, 3,
2	• Introduction to ISCA • 3 ISCA Case Studies	• Short video lecture • ISCA case studies on Video • Reading	2
3	• What is basic systems thinking? • Systems Thinking in infrastructure planning using a computer model	• Short video lectures • Lessons in Slide format • Q&A session on Video • Relevant Youtube videos • Reading • Quizzes	4, 5, 6
4	• Life Cycle thinking in infrastructure planning • Life Cycle Thinking related to infrastructure planning	• Short video lectures • Lessons in Slide format • Q&A session on Video • Relevant Youtube videos • Reading • Quizzes	4
5	• Infrastructure and Sustainable Urbanism 1 • Infrastructure and Sustainable Urbanism 2	• Short video lectures • Lessons in Slide format • Q&A session on Video • Relevant Youtube videos	1, 2, 3, 4, 5

		• Reading • Quizzes	
6	• Sustainable transport and sustainable design guidelines • Sydney Metro Project • Environmental Impact Assessment (EIA) in transport projects	• Short video lectures • Lessons in Slide format • Q&A session on Video • Relevant Youtube videos • Reading • Quizzes	1, 2, 5, 6
7	• National infrastructure planning • Financing infrastructure • Global infrastructure challenge	• Short video lectures • Lessons in Slide format • Q&A session on Video • Relevant Youtube videos • Reading • Quizzes	1, 5
8	• Sustainable energy challenge • Renewable energy transformation in Australia	• Short video lectures • Lessons in Slide format • Q&A session on Video • Relevant Youtube videos • Reading • Quizzes	1, 2, 5, 6
9	• Sustainable water Infrastructure in Perspective • Water Conservation and achieving sustainability • Green Infrastructure	• Short video lectures • Lessons in Slide format • Q&A session on Video • Relevant Youtube videos • Reading • Quizzes	1, 2, 5, 6
10	• Waste Management • Challenges with waste • Land fills and infrastructure	• Short video lectures • Lessons in Slide format • Q&A session on Video • Relevant Youtube videos • Reading • Quizzes	1, 2, 5, 6