COURSE OBJECTIVES

- To broaden the view of the participants on turning perceived disadvantage to strength, as is illustrated in offshore supply, offshore platform construction, port and shipping, and water management in land-scarce and resource-limited Singapore

- To provide examples and offshore engineering works such as coastal development, port operation ad shipping, jack-up rigs, floating platform, and laying of submarine pipelines that will enhance the interest and appreciation of the participants on marine, coastal and offshore engineering practices

- To provide a broad perspective to the participants on the background and development of environment and water management, both inland and marine, and elaborate in details water practices in Singapore, the goals, challenges, and milestones achieved.

As English is not the native language of the participants, and it is inevitable that the participant would need to make formal presentation in English in their later career, a guest speaker is included to provide pointers and tips on making impactful technical presentation in English.

COURSE CONTENT

The course comprises 16 hours of lectures on specific offshore engineering applications, marine environment and water management, 2 hours of experience, tips and techniques of making formal technical presentation, 12 hours of relevant mini projects which would culminate as the team project final presentation and oral presentations (6 hours).

A. Lecture topics

1. Coastal development in Singapore [TSK]
2. Management of Water in Singapore [TSK]
3. Characteristics of offshore platforms and submarine pipeline technology [GWM]
4. Introduction to Mechanics of Sediment Transport [LSY]
5. Green shipping and the environment [TKH]
6. Preparing for Group Project and Making Impactful Presentation [JC]

B. Class schedule

The preliminary class schedule Runs 1 and 2 are as follow :

Run 1: Jan 12 – 19, 2023			
Session	Date/time	Content	Instructor
1	Jan 12 (Thu) 0900 - 1100	Introduction Coastal development in Singapore	Tan Soon Keat
2	Jan 12 (Thu) 1400-1600	Water Management in Singapore	Tan Soon Keat
3	Jan 12 (Thu) (3 hours)	Team Mini project (1)	Teamwork

4	Jan 13 (Fri) 0900-1200	Introduction to Mechanics of Sediment Transport	Lim Siow Yong
5	Jan 13 (Fri) 1400-1600	Making Impactful Presentation	Joy Chua
6	Jan 13 (Fri) (3 hours)	Team Mini project (2)	Teamwork
7	Jan 16 (Mon) 0900-1100	Shipping and the Environment	Tan Kim Hock
8	Jan 16 (Mon) 1400-1600	Towards Green Shipping	Tan Kim Hock
9	Jan 16 (Mon) (3 hours)	Team Mini project (3)	Teamwork
10	Jan 17 (Tue) 0900-1130	Characteristics of offshore platforms	Gho Wie Min
11	Jan 17 (Tue) 1400-1630	Submarine pipeline technology	Gho Wie Min
12	Jan 17 (Tue) (3 hours)	Team Mini project (4)	Teamwork
13	Jan 18 (Wed) 0900-1200	Project Presentation Groups 1 – 3	Tan Soon Keat
14	Jan 19 (Thu) 1400-1700	Project Presentation Groups 4 - 6	Tan Soon Keat

Run 2: Feb 6 – 13, 2023			
Session	Date/time	Content	Instructor
1	Feb 6 (Mon) 0830 - 1030	Introduction Coastal development in Singapore	Tan Soon Keat
2	Feb 6 (Mon) 1400-1700	Introduction to Mechanics of Sediment Transport	Lim Siow Yong
3	Feb 6 (Mon) (3 hours)	Team Mini project (1)	Teamwork
4	Feb 7 (Tue) 0900-1100	Shipping and the Environment	Tan Kim Hock
5	Feb 7 (Tue) 1400-1600	Towards Green Shipping	Tan Kim Hock
6	Feb 7 (Tue) (3 hours)	Team Mini project (2)	Teamwork
7	Feb 8 (Wed) 0900-1100	Making Impactful Presentation	Joy Chua
8	Feb 8 (Wed) (3 hours)	Team Mini project (3)	Teamwork

9	Feb 9 (Thu) 1400-1600	Water Management in Singapore	Tan Soon Keat
10	Feb 9 (Thu) (3 hours)	Team Mini project (4)	Teamwork
11	Feb 10 (Fri) 0830-1100	Characteristics of offshore platforms	Gho Wie Min
12	Feb 10 (Fri) 1400-1630	Submarine pipeline technology	Gho Wie Min
13	Feb 13 (Mon) 0830-1030	Project Presentation Groups 1 – 2	Tan Soon Keat
14	Feb 13 (Mon) 1400-1800	Project Presentation Groups 3 - 6	Tan Soon Keat

C. Group projects

The participants will form group of 5 and undertake a class project. The group will work as a team, through 4 mini projects (12 hours) exploring the brief history, current development, and future trends of the selected topic. Each member of the group will be allocated 1 hour to make a presentation on the project.

The followings are possible project titles:

No.	**Project title**	**Remarks**
1	Sponge city – is it a solution for all urban centres?	Water management
2	Issue and consideration for water reclamation	Water Management
3	General beach stabilization schemes	Coastal development
4	Land reclamation – issues and solution	Coastal development
5	Characteristics of offshore fixed and floating structures in response to environmental forces	Offshore engineering
6	Comparison of the structural behavior of three (3) types of offshore floating platforms	Offshore engineering
7	Considerations of strength, stability, and span assessment in submarine pipeline design	Offshore engineering
8	Characteristics of various pipe laying methods in shallow and deep water working environments	Offshore engineering
9	Bed and bank protection at the outlet of a culvert	Jet scour
10	Bed and bank protection at the outlet of below a sluice gate	Jet scour
11	Identify shipping activities and their impacts on the environment.	Shipping – Impacts on the environment

No.	Project title	Remarks
12	The technologies and progress towards: “Green Shipping”	Towards “Green Shipping”

Biography of Instructors

Dr Tan Soon Keat is both an academic staff member in Nanyang Technological University, Singapore since 1984, and a professional engineer practising as a consultant for over 40 years in areas including hydraulic design, water resources engineering, sediment transport and coastal engineering. In particular, Dr Tan conducts numerical and physical model studies for hydraulic systems, on such project as river training, coastal defence, nearshore and offshore structures and platform, ocean intake and outfall, pumping stations, pipe network, as well as dispersion and diffusion in the surface water and subsurface water and aquifer. Recently Dr Tan becomes increasing involved with environmental engineering in such issues as water quality, environmental impact and solid waste management from the perspective of surface water management. At the national level, Dr Tan has served as a member of the drainage design review panel for the Ministry of Environment and Water Resources, Singapore, and is currently a resource specialist in the panel of the GPC MND/MEWR Resource/NEA Panel for Singapore. Dr Tan's research interests include application of geographical information system (GIS) in water resources, numerical simulation of flow for hydraulics, hydrodynamics and coastal engineering applications.

Dr Lim Siow Yong is an Associate Professor in the School of Civil and Environmental Engineering, Nanyang Technological University. He received his Ph.D. from the University of Liverpool, 1985. He joined NTU in 1991. His research and consulting works focus in the areas of hydraulic and water resources engineering in general and in localised scour phenomena around hydraulic structures in particular.

Capt Tan Kim Hock, Deputy Director for Maritime Studies in the School of Civil and Environmental Engineering, Nanyang Technological University. A veteran figure in Singapore’s Maritime Industry, He started his sea career from Cadet to Captain in NOL and sailed the seven seas for some 30 years. Remained in Command of foreign going vessels 13 years; Embarked ashore serving the industry, from a Safety Auditor to position of MD leading shipping companies prior to joining NTU. Presently, he is actively involved with the industry and University in Maritime Studies Curriculum and focus on enhancements. He lectures Maritime Technology and Ship Chartering, along with other related maritime subjects

Dr Gho Wie Min has more than 30 years of experience in engineering education, training and consultancy service, and project management in the offshore marine and renewable energy industries. He was previously an assistant professor and director for MSc Offshore Engineering programme at Nanyang Technological University (2001-06). He has worked as a production engineer at McDermott Indonesia and a structural, pipeline and project engineer at J Ray McDermott Singapore (1992-97). He has also worked as a senior engineer at American Bureau of Shipping for the design guide development of offshore floating structures and the setup of offshore technology center (2006-08). He was involved in some technology development such as the fixed and floating LPG terminal systems, research programme on the underwater infrastructure and underwater city for the future funded by the National Research Foundation Singapore (2010-15), the deep water jack-up drilling unit and the small scale floating storage regasification unit funded by SPRING Singapore (2014-18). The recent assignment is the intelligent aquaculture and fishery resources exploitation technology in deeper waters funded by the Ministry of Science and Technology China. He is currently a consultant and trainer, holds the position of the director at Maritime Production Research, and a member of the leadership committee of LNG Center of Excellence ™ Houston.

Ms Joy Chua is a specialist consultant and trainer at Tawazhota Consultants Pte Ltd. She is trained in the Building and Construction industry, project information and management. She is involved in the preparation of strategic reports, formal presentations, boardroom meetings and technical assessments. Joy holds a post graduate degree in Information Studies.