

National University of Singapore,

College of Design and Engineering

Background of attachment

TWA+ at the College of Design and Engineering (CDE) intends to provide teachers greater understanding of CDE and its programmes so that they may communicate better to their students on the different design and engineering programmes in the tertiary education landscape. CDE will be offering **16 attachment opportunities** from our 14 undergraduate programmes and 2 second majors. Teachers can indicate the programmes of interest based on the programme description listed in Table 1. The duration of the attachment is 2 weeks and during this period, teachers may be attached to more than one programme of interest depending on the hosts' availability for greater exposure to the different programmes offered at CDE.

During the 2 weeks, teachers will be able to participate in a wide range of activities including hands-on laboratory learning, site visits, working with ongoing research teams, and observing lectures conducted by CDE professors.

Programmes offered (Undergraduate Programmes)

Creating Sustainable Innovations

1. Civil Engineering
2. Environmental Engineering
3. Infrastructure & Project Management

Designing the Future

1. Architecture
2. Landscape Architecture
3. Industrial Design

Reimagining Technology

1. Computer Engineering
2. Electrical Engineering
3. Industrial & Systems Engineering
4. Mechanical Engineering

Impacting Lives

1. Biomedical Engineering
2. Chemical Engineering
3. Engineering Science Programme
4. Materials Science & Engineering

Programmes offered (CDE Second Majors)

1. Innovation & Design Programme
2. Sustainable Urban Development

More information can be found below:

INDUSTRY/ SECTOR	Education/ Institute of Higher Learning
NATURE OF ATTACHMENT	The duration of the attachment is 2 weeks and during this period, teachers may be attached to more than one programme of interest depending on the hosts' availability. Teachers can indicate their 2 week period of availability within the windows below and daily attachment timing is negotiable.
LEARNING OBJECTIVES	Through this attachment, teachers will: <ol style="list-style-type: none">1. Develop deeper understanding of CDE programmes, teaching pedagogies and gain insights about ongoing research activities2. Engage and network with CDE professors, students, research teams and other STEM teachers3. Experience the enriching learning environment at CDE through experiential learning, hands-on application and site visits to teaching facilities
CONTENT OF ATTACHMENT	The attachment involves: <ol style="list-style-type: none">1. Familiarisation with CDE programmes' overview, objectives, and outcomes2. Familiarisation with CDE's overview and curriculum3. Understanding programme academic hosts' teaching pedagogies, key area of teaching or research (i.e. attending lectures, conducting lab experiments etc.)4. Participating in discussions with academic hosts, research or student project teams related to the key area of teaching or research5. Contributing in the ideation for curriculum planning using concepts learned
ATTACHMENT PERIOD	1st Quarter: 15 Jan - 8 Mar 2024 (excluding NUS Reading Week 26 Feb – 1 Mar 2024) 2nd Quarter: 18 Mar - 19 Apr 2024 3rd Quarter: 12 Aug - 30 Aug 2024 4th Quarter: 9 Sep - 15 Nov 2024 (excluding NUS Reading Week 23 Sep – 27 Sep 2024)
PRE-REQUISITES	Teachers and ECG Counsellors with or without STEM background are encouraged to apply to learn more about design and engineering.
APPLICATION PROCESS	1. Please register via MOE Intranet at least 2 months prior to your proposed start date of attachment.

	<p><i>Example, if you would like to start your attachment on 14 August, please register by 14 June.</i></p> <p>2. Please view Table 1 below for the description of the programmes.</p> <p>3. In your application to MOE, shortlist your top 5 programmes of interest. <i>Example:</i></p> <p>1st Choice: Innovation & Design Programme 2nd Choice: Civil Engineering 3rd Choice: Engineering Science Programme 4th Choice: Industrial & Systems Engineering 5th Choice: Sustainable Urban Development</p> <p>4. Indicate your proposed start and end dates (2 weeks duration). <i>Example:</i></p> <p>Start date: 14 August 2024, Monday End date: 25 August 2024, Friday</p> <p>5. CDE will update on the programme availability.</p>																															
Sample Attachment	<table border="1"> <thead> <tr> <th>Month</th> <th>NUS Week</th> <th>MON</th> <th>TUE</th> <th>WED</th> <th>THUR</th> <th>FRI</th> </tr> </thead> <tbody> <tr> <td rowspan="4">Oct '23</td> <td rowspan="2">Week 7</td> <td>DAY 1 2 START</td> <td>DAY 2 3</td> <td>DAY 3 4</td> <td>DAY 4 5</td> <td>DAY 5 6</td> </tr> <tr> <td>Orientation + Tour</td> <td colspan="4">IDP Attachment</td> <td>ESP Attachment</td> </tr> <tr> <td rowspan="2">Week 8</td> <td>DAY 6 9 No scheduled activities</td> <td>DAY 7 10</td> <td>DAY 8 11</td> <td>DAY 9 12</td> <td>DAY 10 13 END</td> </tr> <tr> <td></td> <td>ESP Attachment</td> <td colspan="2">ISE Attachment</td> <td>Debrief</td> </tr> </tbody> </table>	Month	NUS Week	MON	TUE	WED	THUR	FRI	Oct '23	Week 7	DAY 1 2 START	DAY 2 3	DAY 3 4	DAY 4 5	DAY 5 6	Orientation + Tour	IDP Attachment				ESP Attachment	Week 8	DAY 6 9 No scheduled activities	DAY 7 10	DAY 8 11	DAY 9 12	DAY 10 13 END		ESP Attachment	ISE Attachment		Debrief
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ENQUIRIES	<p>CDE's website: https://cde.nus.edu.sg/ Email: Ms Izzah (izzah.s@nus.edu.sg)</p>																															

Table 1: Programme Description

Creating Sustainable Innovations	
Programme Name	Programme Description
Civil Engineering	<p>Civil Engineers plan, design and create the world around us. With a civil engineering degree, students will be able to play a vital role in transforming the built environment. Our graduates can make a difference to people and world by creating smart, sustainable and resilient urban systems. They will be empowered with the skills from the programme to tackle complex issues that range from mitigating climate change to planning, financing and managing mega infrastructures.</p>

Environmental Engineering	<p>Environmental Engineering draws from the science of biology, chemistry, ecology and hydrology to devise sustainable solutions to improve our quality of life, while maintaining a clean and healthy environment. Our domains include air pollution and water quality monitoring and control, circular economy and resource management, climate change mitigation, water reclamation and reuse, public health, safety and environment, renewable energy, and sustainability development.</p>
Infrastructure & Project Management	<p>Infrastructure and Project Management traverses the domains of engineering, design, management, technology, building science, and law. We nurture built environment professionals with deep knowledge and skills in planned specialisations such as Cost and Contract Management, Facilities Management, and Sustainable and Digital Technologies. We also develop the ability of future professionals to make cogent connections across broad but related disciplines.</p>
Designing the Future	
Programme Name	Programme Description
Architecture	<p>Architecture champions design excellence through studio research, exploration, and making. The fundamental skills of drawing, model-making and visual representation are complemented by an inspiring and interdisciplinary curriculum comprising architectural history, theory, tectonics, as well as environmental systems and building technologies. An extensive range of issues-driven studio topics promotes the development of thinking and design skills necessary for students to take on complex issues of the built environment in Asia and beyond.</p>
Landscape Architecture	<p>Landscape Architecture prepares students to respond to multifaceted issues in Asia. Our core emphasis is design excellence that is grounded in critical thinking, analytical inquiry, and creative expression. We imbue our students with a deep understanding of the dual nature of design as both a process and a product. This programme provides the core foundation, training, as well as skills and knowledge for our students to become the next generation of effective and innovative landscape architects.</p>
Industrial Design	<p>Industrial Design specialises in innovating for humanity. Its purpose is to create new products, services, spaces, apps, user experiences, and businesses that people love. Industrial designers create with deep understanding of how human beings perceive, adopt, and use innovative</p>

	solutions - and how tangible and immaterial resources can be put together to make these solutions happen.
Reimagining Technology	
Programme Name	Programme Description
<u>Computer Engineering</u>	Computer Engineers link sophisticated hardware to software, bringing intelligence to devices from the ubiquitous mobile phones to autonomous vehicles on land, air, sea, even in space. Computer engineers focus on solving real-world problems by designing hardware and software interfaces to connect the physical and virtual, creating solutions that are bigger than the sum of their parts.
<u>Electrical Engineering</u>	Electrical Engineering centres on the design and fabrication of components, devices and systems that use electricity. This includes the smallest microchips in smart devices to power grids that span the nation. Our graduates will master the physics and mathematics of electricity, electronics and electromagnetism, and apply them to create systems that transmit and process information, generate and deliver energy and enable mobility.
<u>Industrial and Systems Engineering</u>	Industrial and Systems Engineering strives to improve systems and processes so they run profitably, efficiently and safely. Our graduates will use extensive mathematical tools for modelling and computational methods for analysis, evaluation and optimisation. They will also use data science and artificial intelligence to understand complex systems.
<u>Mechanical Engineering</u>	Mechanical Engineering is one of the broadest and most versatile of the engineering disciplines, involving the design, manufacture or operation of any product or system that moves and uses or produces energy. It is at the centre of almost all technical advancements, from healthcare to transportation, mobile phones to biomedical devices, aircraft to powerplants. Our graduates will have the knowhow to solve real-world problems in areas such as renewable energy, future transportation and healthcare.
Impacting Lives	
Programme Name	Programme Description
<u>Biomedical Engineering</u>	Biomedical Engineering helps people live safer and healthier lives through the design and development of medical devices, techniques, instrumentation and software used in healthcare, ranging from regenerative medicine and synthetic biology to medical robotics and digital therapeutics. Our graduates combine knowledge

	and skills from design, biology, physiology, imaging, electronics, machine learning, and robotics to analyse and solve complex problems in medicine and healthcare.
<u>Chemical Engineering</u>	Chemical Engineering is engaged with large-scale chemical conversion of raw materials into useful products in a safe sustainable, energy-efficient and economical way. Our graduates are equipped with the knowhow to manufacture chemicals, fuels, plastics, electronics, pharmaceuticals, food and beverages, even consumer goods. Our graduates can also invent new technologies for cleaning up the environment, and pioneer developments in recycling, clean energy, water purification, medicine and biotechnology.
<u>Engineering Science Programme</u>	Engineering Science is the integrated application of engineering and science to solve complex, multidisciplinary problems by working at the interfaces of traditional disciplines. Our graduates will be able to use their board-based interdisciplinary training and mindset to create innovative technologies that tackle today's increasingly complex issues.
<u>Materials Science & Engineering</u>	Materials Science and Engineering improves what things are made of and how they are made. It goes beyond selecting the best material for an application. Focus is placed on developing custom materials from specific properties tailored for specific uses. Our graduates will gain cutting-edge knowledge and skills to create new materials that can yield new applications and revolutionary technologies.
CDE Second Majors	
Programme Name	Programme Description
<u>Innovation & Design Programme</u>	The Innovation and Design Programme (iDP) trains engineering and non-engineering students with an entrepreneurial mindset, applying their knowledge and skills to solving problems or designing new products, services, and experiences. Our iDP students will learn tools and processes for ideation and design from working together on hands-on projects with real-world impact, incorporating healthcare, urban mobility, sustainable cities, smart living, intelligent systems, and immersive reality. Structured as a Second Major or Minor in Innovation & Design, the iDP can be taken with any primary major.

Sustainable Urban Development

Sustainable Urban Development (SUD) aims to provide students with broad exposure to the field of urban sustainability from an interdisciplinary viewpoint. SUD equips students with cross-disciplinary knowledge and unique skillsets to be able to tackle the most pressing issues of urban development such as climate change, mitigate its human impacts, and make cities more liveable, sustainable and climate-resilient.