INDUSTRIAL & SYSTEMS ENGINEERING

Nurturing Holistic Engineers, Impacting Lives
Industrial & Systems Engineering draws concepts from engineering, mathematics, economics, statistics and social sciences to derive efficiency and productivity improvement that is required in today’s increasingly competitive global market.

The NUS Industrial & Systems Engineering programme equips students with a comprehensive and rigorous set of analytical and management skills required to identify, analyse and design complex production systems. Graduates will be able to engineer processes and systems, and develop innovative solutions to improve quality and productivity.

Industrial & Systems Engineering is unique among the engineering disciplines as its techniques can be applied across a diverse range of industries, such as logistics and supply chain management, banking and finance, consultancy services, entertainment, healthcare etc.
Emphasis on different modelling approaches and how the structure of analysis is changing, as well as implementation and analytical issues of public sector risk evaluation and management.

The nature of human factors engineering precludes "one size fits all" solutions, but several tools and techniques are commonly used as human factor approaches to address safety issues.

A discipline that combines processes and procedures from systems engineering, systems management, and product development for the purpose of developing large-scale complex systems. These systems involve hardware and software, and may be based on existing or legacy systems coupled with totally new requirements to add significant functionality.

Operations research focuses on practical applications, and is concerned with determining the maximum (of profit, performance, or yield) or minimum (of loss, risk, or cost) of some real-world objectives.

Plan, coordinate, design, implement and control the quality function in manufacturing and service companies in order to increase productivity, optimise resources, improve product quality etc.

Integrates supply and demand management within and across companies, which encompasses planning and management of all activities involved in sourcing and procurement, logistics management, as well as manufacturing operations.

Focuses on synthesis, analysis, optimisation and space as well as other complex systems in domains such as energy, naval engineering, air transportation and logistics.
Industrial & Systems Engineering is unique among the engineering disciplines as the application of its techniques is not restricted to specific technological and industrial problems. Its applications can be found in a wide range of industries such as:

- **Logistics & Transportation**: Supply Chain Management, Distribution Network Design, Transport Planning Analysis, Order Fulfillment, Vendor Managed Inventory
- **Manufacturing/Engineering**: Quality & Reliability, Process Engineering, Human Factors, Advanced Production Planning
- **Public Sector**: Industry Analysis, Productivity Improvement, Research & Development, Service Quality, Defence Operations Analysis
- **Financial & Business**: Management Consultancy, Risk Analysis, Financial Analysis, Operations Analysis
- **Other Services**: Healthcare Service Management, Project Management, Process Improvement, Systems Integration, Six Sigma Consultancy

NUH Nursing has been privileged to have been able to work with students from NUS Industrial & Systems Engineering for a project to streamline the medication administration process. Although they did not have prior exposure in a healthcare setting, the students stepped up well to the challenge, especially in developing a clear understanding of the established standards and issues, as well as defining very relevant root causes to develop plausible solutions.

Ng Sow Chun  
Deputy Director, Nursing Administration, National University Hospital (NUH)
NUS Industrial & Systems Engineering is a great course that helped shape who I am. The excellent teaching and support that the department gave really helped me learn the skills needed for the workforce. The helpful and caring professors as well as the department staff made the four years spent preparing myself for the workforce an easy and enjoyable process.

**Lim Theck Yee, Class of 2017**  
Associate Consultant,  
Wright Management International

After graduating from NUS Industrial & Systems Engineering, I was fortunate to get a job as an Industrial Engineer in a semiconductor firm where I can put all the knowledge which I have learnt through my course of study into real-life industrial setting. From System Thinking to Project Management and to Lean Manufacturing, I found that the skill sets that NUS Industrial & Systems Engineering taught were highly useful and readily applicable to my day-to-day job function. NUS Industrial & Systems Engineering is a well-designed programme, which seeks to equip students with essential skill sets well sought after by various industries.

**Tan Hui Min, Class of 2016**  
Industrial Engineer,  
STMicroelectronics

After my SDP project at Tan Tock Seng Hospital, where we were tasked to improve the Pharmacy Supply Chain, I became interested in the healthcare industry. This has led me to join Integrated Health Information Systems (IHiS). Singapore’s health ecosystem is extremely complex and at IHiS, we manage highly integrated IT systems across Singapore’s healthcare sector. With my experience in pharmacy operations, I am now supporting the Inpatient Pharmacy Automation System.

The objective is to reduce medication errors and enhance patient safety through the automation process. My role at IHiS is very meaningful as our work will ultimately improve the population’s health and the healthcare administration in Singapore.

I am glad that the NUS Industrial & Systems Engineering curriculum has given me the opportunity to be exposed to the healthcare industry, and prepared me to take on real-world problems.

**Tan Wen Jie, Class of 2016**  
Systems Analyst,  
Integrated Health Information Systems (IHiS)