

2nd Major in Systems Engineering

Systems Engineering for the Future

Why Does Systems Engineering Matter Now?

Engineering the complex systems that shape tomorrow

AI

Autonomous Systems

Smart Infrastructure

Sustainable Engineering

Digital Transformation

Engineering Is Becoming More Complex

The Nature of Engineering Has Changed

PAST

- | Stand-alone products
- | Single engineering discipline
- | Hardware-centric design



TODAY

- | Connected systems
- | Hardware + Software + AI + Data
- | Multiple stakeholders
- | Safety, security and sustainability requirements

Complexity is increasing — and someone must integrate it all.

Global Technology Trends

Systems Engineering Enables Future Technologies



Artificial Intelligence



Autonomous
Vehicles & Robots



Smart Cities



Digital Twins



Industry 4.0



Internet of Things
(IoT)



Sustainable Energy
Systems



Healthcare
Technologies

These are systems — not isolated products.

Why Systems Engineering?

The Integrator of Engineering Disciplines

Systems engineers connect:

Mechanical Engineering

Electrical & Electronics Eng.

Software Engineering

AI & Data Analytics

Human Factors

Operations

Business Requirements



Delivering one integrated, reliable solution.

Relevance to Singapore

Supporting National Priorities

Systems Engineering contributes to:



Smart Nation



Semiconductor Industry



Sustainable Infrastructure



Maritime & Port Automation



Advanced Manufacturing



Healthcare Innovation



Urban Mobility



Future Air Mobility

What Systems Engineers Do

Instead of designing one component, they:



Define stakeholders and needs



Develop system architecture



Integrate multiple technologies



Manage interfaces



Balance cost, performance and safety



Verify and validate complete systems

Careers of the Future

Opportunities Across Industries



Aerospace



Healthcare



Semiconductors



Transportation



Manufacturing



Energy



Robotics



Defence



Smart
Infrastructure

Career Pathways

Systems Engineer

Technical Lead

Engineering Manager

Systems Architect

Chief Engineer/ CTO

The Big Idea

The Engineers Who See the Whole Picture

Engineers

build components.

vs

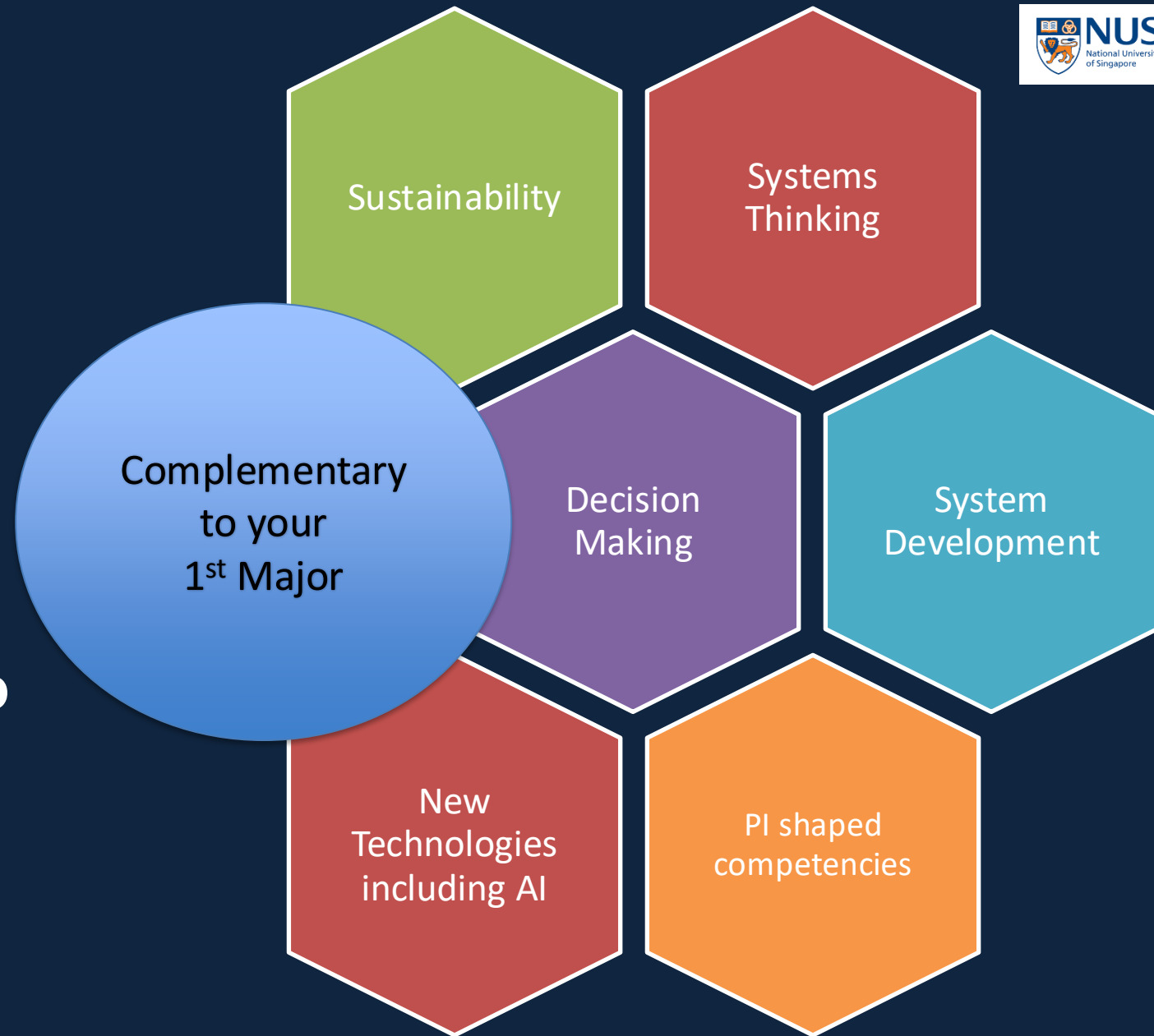
Systems Engineers

build systems.

Future engineering challenges require integration, collaboration and systems thinking.

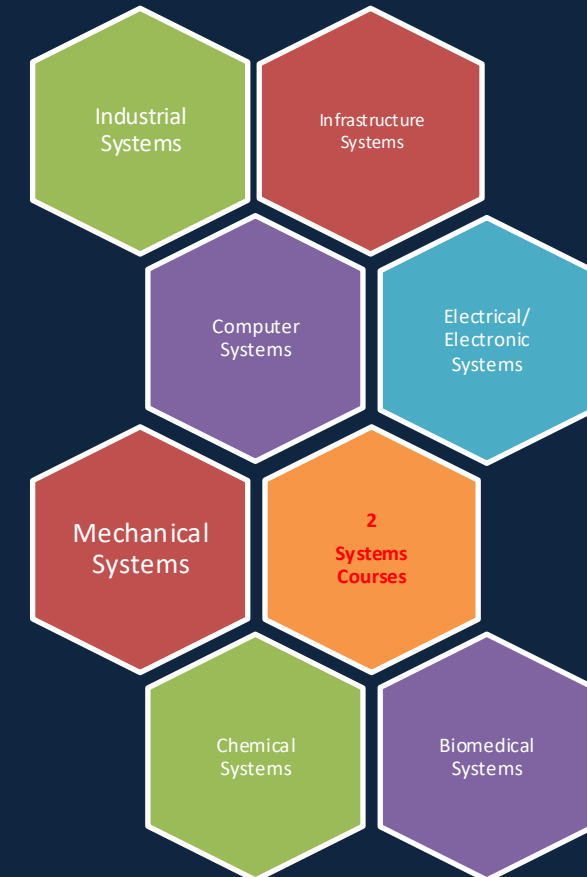
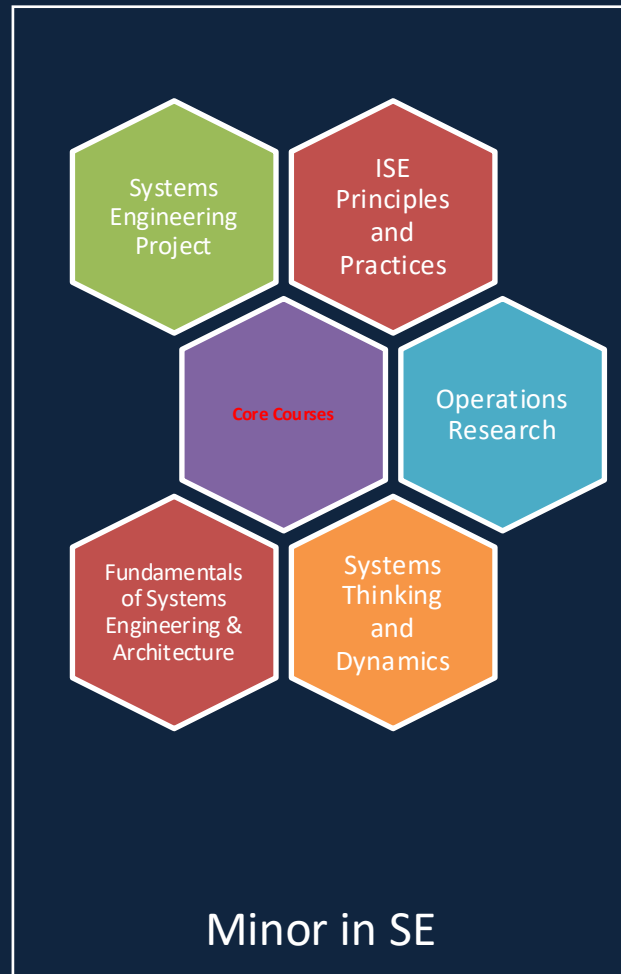
Think Beyond Components. Engineer the Whole System.

Why 2nd Major in Systems Engineering?



Industry Projects

2nd Major in Systems Engineering





To find out more visit:

cde.nus.edu.sg/isem/undergraduate/second-major-in-systems-engineering/



cde.nus.edu.sg/isem/



ug_isem@nus.edu.sg