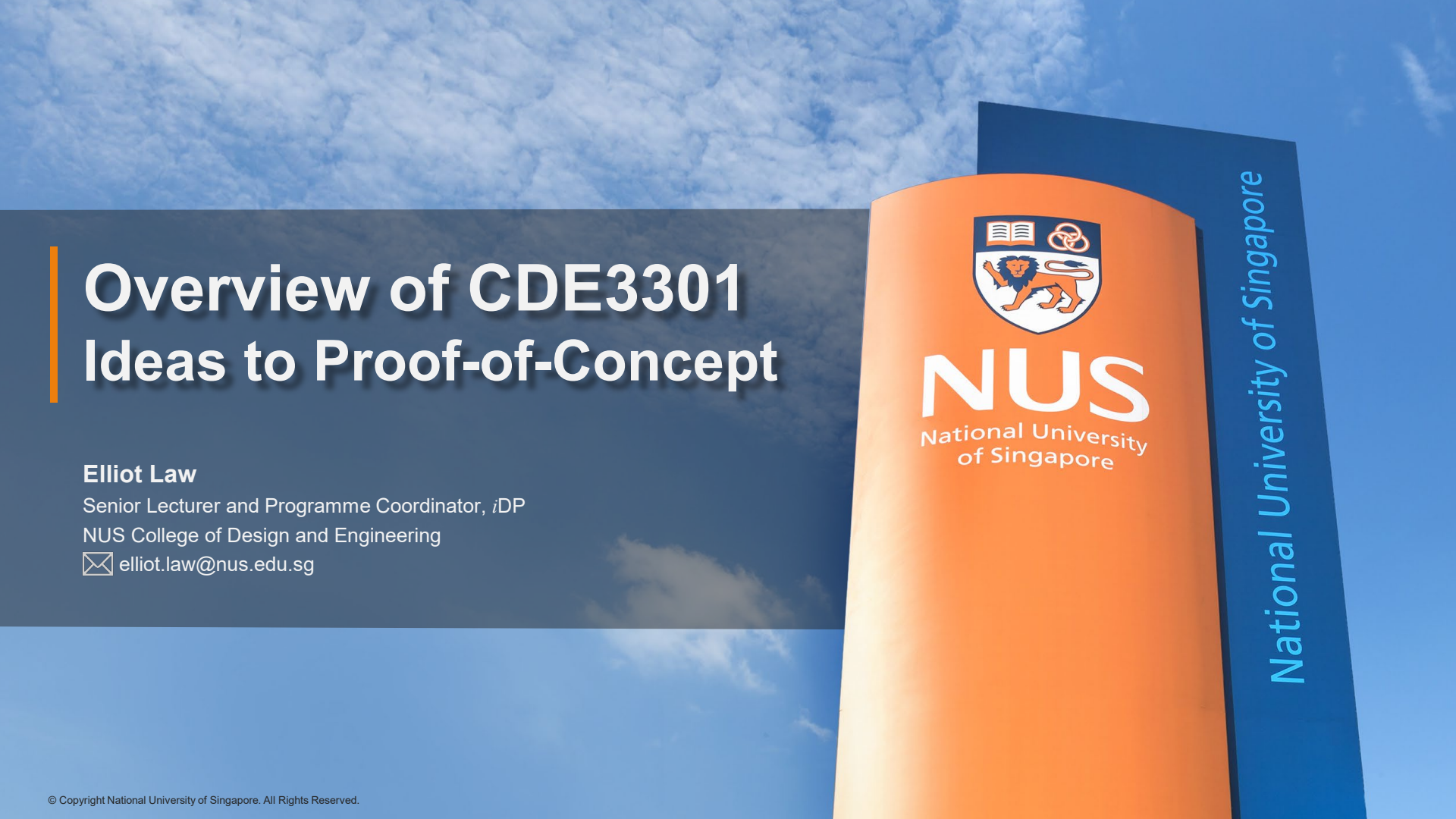
Overview of CDE3301
Ideas to Proof-of-Concept



Elliot Law
Senior Lecturer and Programme Coordinator, *i*DP
NUS College of Design and Engineering
elliot.law@nus.edu.sg

Objective of this info session

- Help you prepare for our year-long design project course:
  - Awareness about different stages of the project course and their associated tasks.
  - Set the right expectations about the deliverables.
  - Roles of lecture classes and studio sessions in this course.
  - How to select or propose topics to work on.

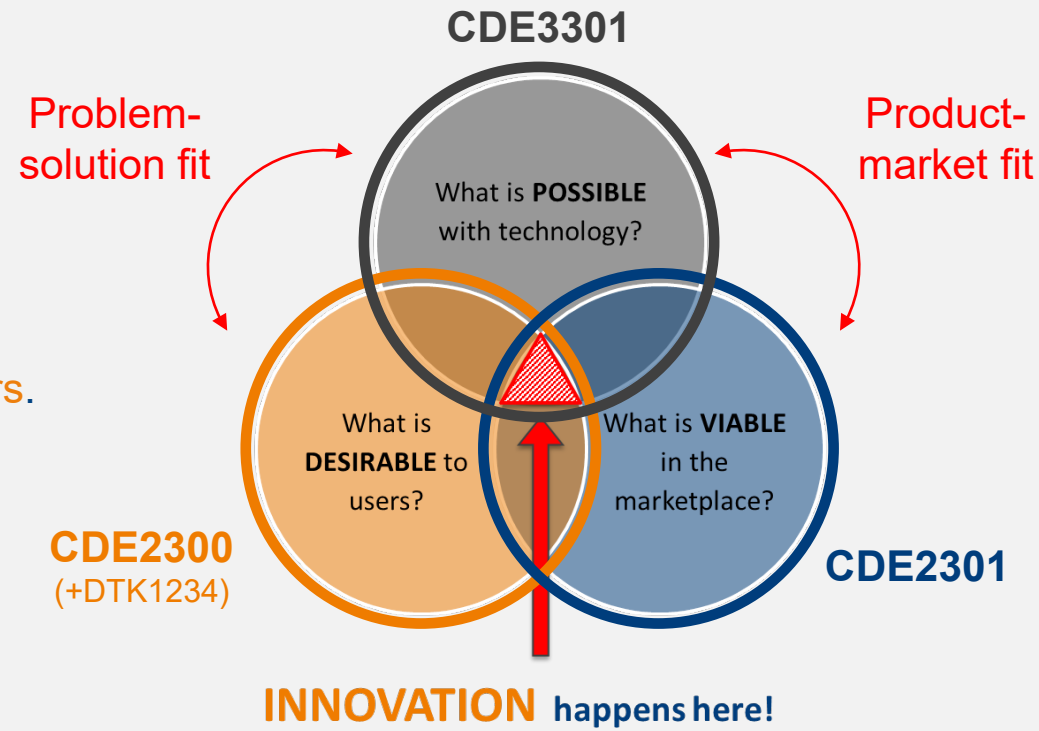
Programme outline

3.30 pm to 4.00 pm: Overview of CDE3301 and studio topics

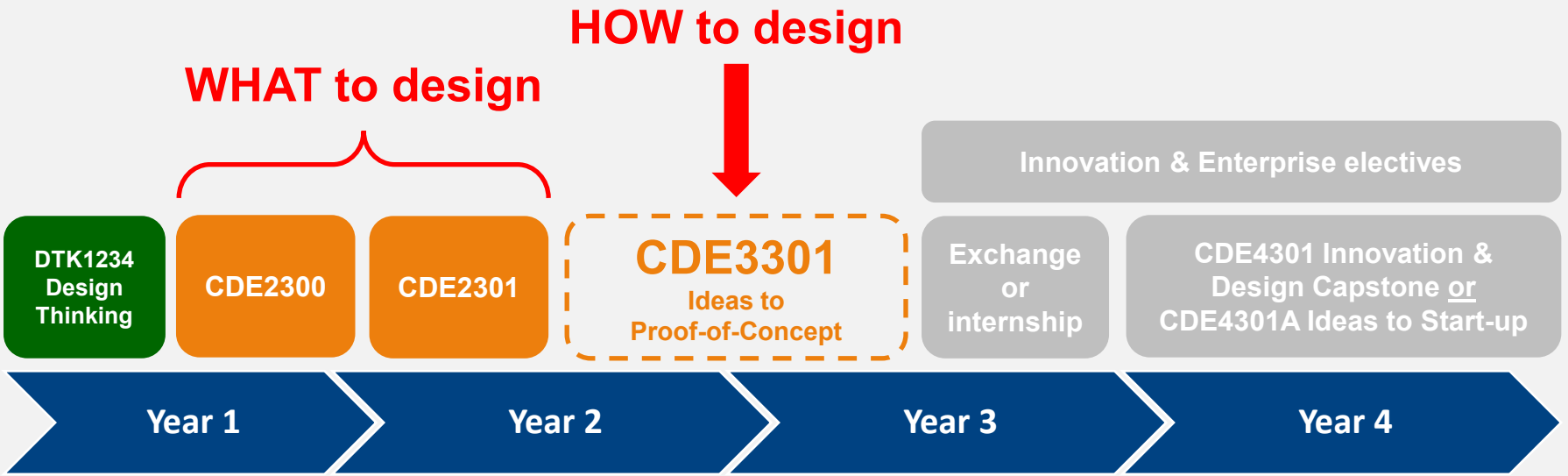
4.00 pm to 5.30 pm: Project booths @ Block E2A

What is innovation?

- Innovation is more than just about creativity.
- Innovation is about:
  - Creating outcomes that are of value to target users or customers.
  - Using technologies that are effective.
  - Result in enterprises that are scalable and sustainable.



Your journey so far



How do CDE2300 (or CDE2310)
and CDE2301 Value Creation in Innovation (or CDE2311 or CDE2605R)
build up to CDE3301 Ideas to Proof-of-Concept?

What you will DO in CDE3301

Ideas

What to design
(Starting point)

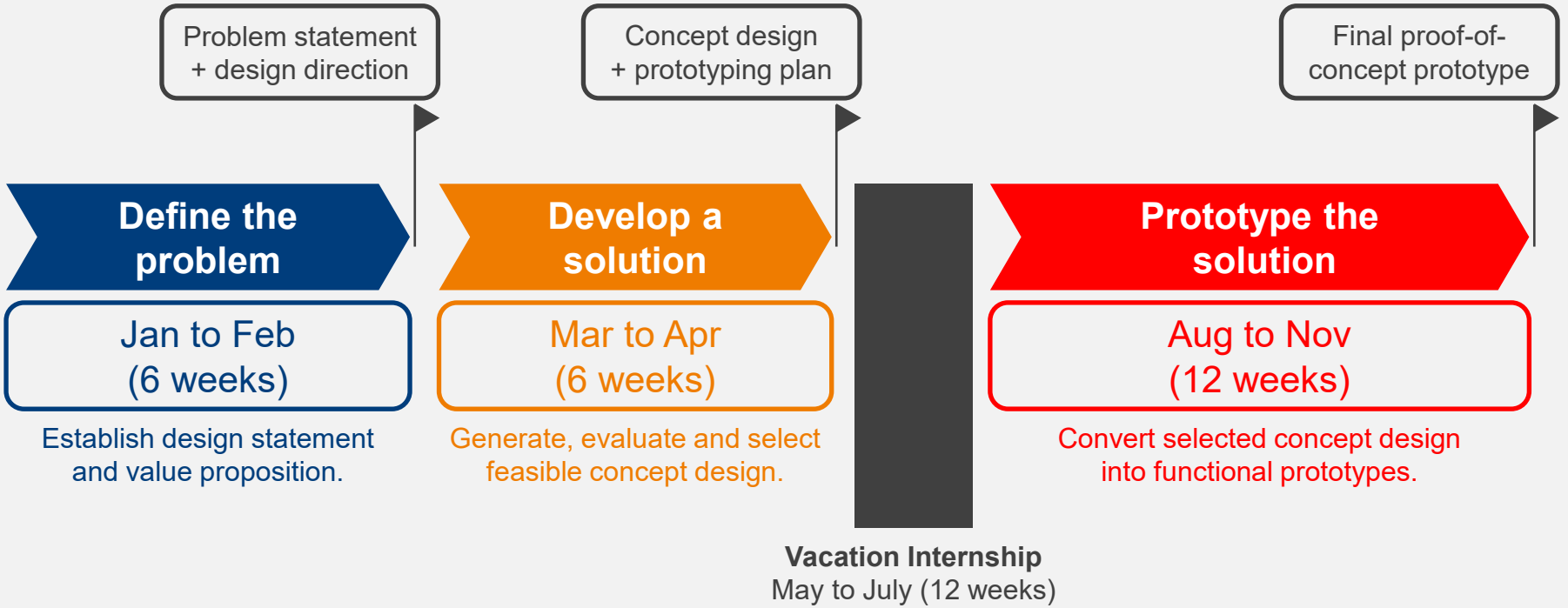
Process

How to design
(The journey)

Proof-of-concept prototypes

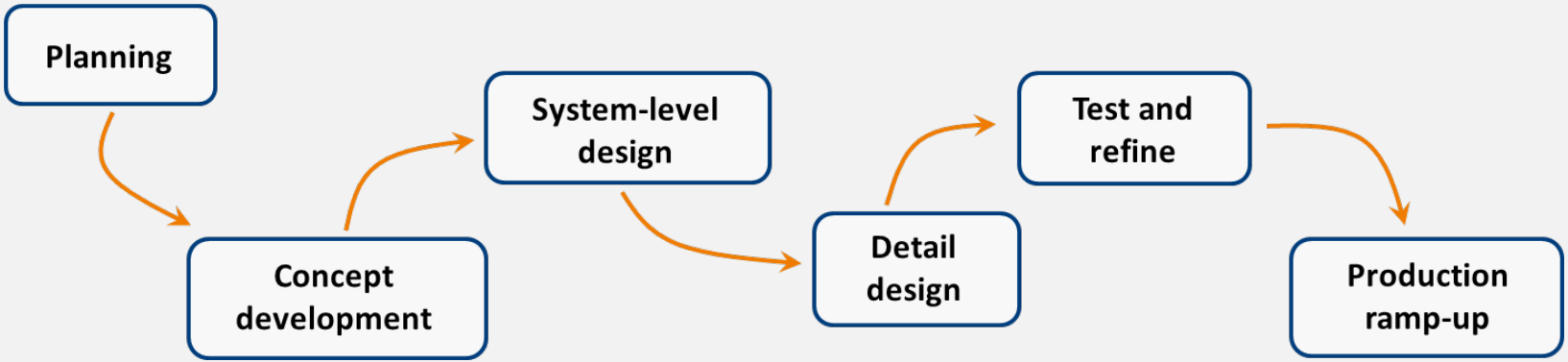
Outcome of design
(End point)

What you will DO in CDE3301



What you will LEARN in CDE3301

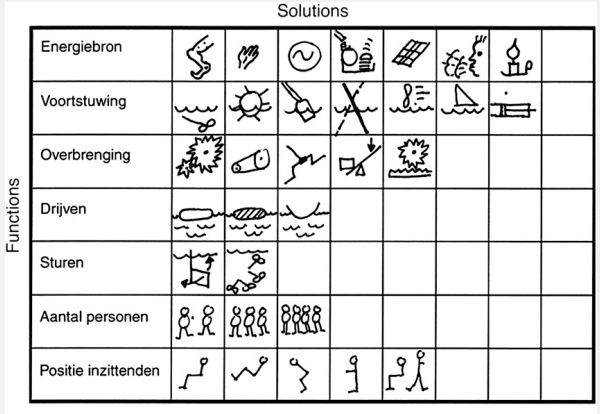
- Systematic product design and development process.
  - Methodologies and tools to translate product ideas into proof-of-concept prototypes.
  - Taught in lecture classes but applied in your project.

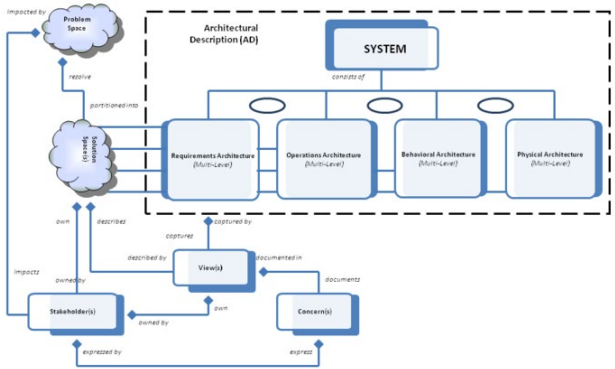


What you will LEARN in CDE3301

- Systematic product design and development process.
  - Methodologies and tools to translate product ideas into proof-of-concept prototypes.
  - Taught in lecture classes but applied in your project.

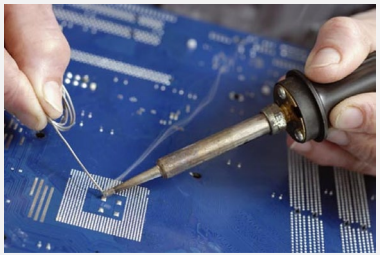
DESIGN REQUIREMENT	SPECIFICATION METRIC:	QUANTITATIVE VALUE:
PORTABLE	COMPACT:	≤ 1 liter
	LIGHTWEIGHT:	≤ 0.5 kg
SUBSTANTIAL OPERATION TIME	POWER:	No mains power
	OPERATION TIME:	1000 measurements before recharge, 8.3 hours
	LIFETIME:	≥ 2 years
	HIGH THROUGHPUT:	≤ 30s per measurement
RELIABLE: DURABLE	TEMPERATURE RESISTANT:	[-10 °C, 55 °C]
	WATER RESISTANT:	≤ 2-3 bar
	STURDY:	Withstand impact force ≤ 313 N*
SAFE	NONINVASIVE:	No skin penetration
	NON TOXIC (FOR PATIENT):	Total Effective Dose ≤ 0.5 mSv*
	NON TOXIC (FOR USER)	Total Effective Dose ≤ 36.5 mSv*
	SHOCK PROOF:	Compliance voltages ≤ 25V DC
EASILY OPERATED	HIGH USABILITY:	Operable by individuals 18+ Unspecified language No previous experience required
	MINIMAL SETUP TIME:	[10s, 15s]
RELIABLE: ACCURATE	LOW FALSE + RATE:	≤ 10%
	LOW FALSE - RATE:	≤ 10%
INEXPENSIVE	LOW PRODUCT COST:	≤ $150
ACCEPTABLE PATIENTS	AGE RANGE:	12+
	WEIGHT RANGE:	[30kg, 100kg]

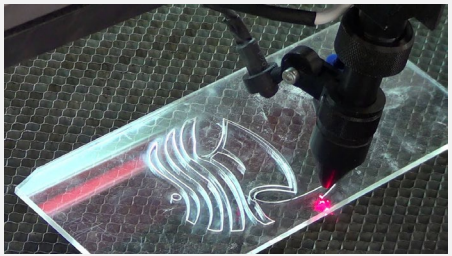


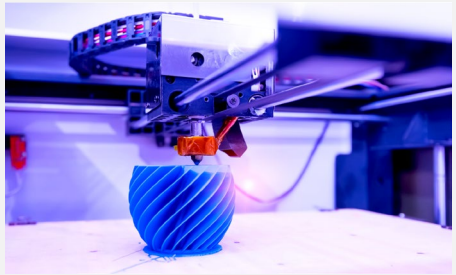


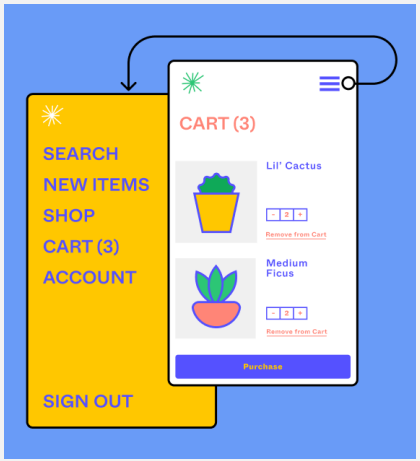
What you will LEARN in CDE3301

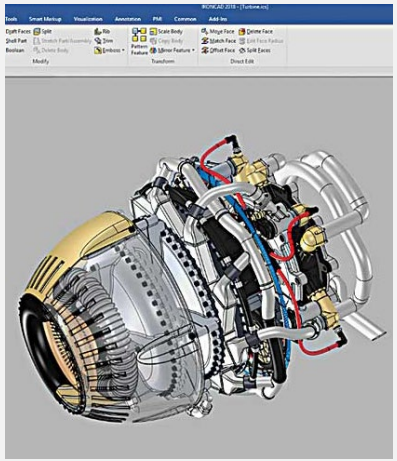
- Hands-on skills in physical and digital prototyping and testing.
  - Through online resources and prototyping workshops.











What you will LEARN in CDE3301

- Systematic product design and development process.
  - Methodologies and tools to translate product ideas into proof-of-concept prototypes.
  - Taught in lecture classes but applied in your project.
- Hands-on skills in physical and digital prototyping and testing.
  - Through online resources and prototyping workshops.
- Content specific to topic of your project.
  - Through activities in studio sessions with your project supervisors.

Classes for CDE3301

- Lecture classes on Wed 6 pm to 9 pm (selected weeks only):
  - Systematic product design and development process.
  - Methodologies and tools to translate product ideas into proof-of-concept prototypes.
  - Taught by course coordinator.
- Studio sessions generally on Wed 9 am to 12 pm or Thu 1 pm to 4 pm:
  - Content specific to topic of your project.
  - Application of content from lecture classes to context of your project.
  - Taught by project supervisors (a.k.a. studio masters).
- Attendance for both is compulsory.

Studio sessions in CDE3301

- Concurrent supervision and teaching of several project groups working on same or similar issues.
- Structured sessions to help you explore different aspects systematically.
- Platform for industry engagement.
- Encourage peer learning and sharing of best practices.

CDE3301 studio topics (for 2026)

Healthcare and Wellbeing

- Designing for Community Wellbeing
- Innovating for Paediatric Care
- MedTech Innovation Studio
- Mental Wellness Studio

Agritech and Sustainability

- Design the Future of Food
- Sustainable Innovation Studio

Intelligent Systems

- Automation and Robotics
- Smart Solutions Studio
- Space Systems Studio: Galassia-5

Smarter Living

- Aviation Studio
- Creating Iconic Audio Experiences
- Intelligent Wearable Technology

Immersive Experiences

- Creative Media Technology
- Immersive Intelligence: Transforming Healthcare and Aviation Futures

Competition Projects

- University Rover Challenge
- Other competition projects?

CDE3301 studio topics (for 2026)

- 14 studios across 5 themes (+ competition projects):
  - Each studio is helmed by project supervisors (a.k.a. studio masters).
  - Specific industry partners or clients for each studio.
  - 8 to 15 students per studio.
- Studio sessions are generally held on Wed AM or Thu PM:
  - Weekly meetings with project supervisors.
  - Selected studios may be scheduled at other times.
- Self-proposed projects are welcomed.
  - Ideally aligned to the 14 studios / 5 themes and can attend same studio sessions.

CDE3301 studio topics (for 2026)

Tentative schedule for studio sessions:

Tuesday 9 am to 12 pm

- Space Systems Studio: Galassia-5

Tuesday 2 pm to 5 pm

- University Rover Challenge

Wednesday 9 am to 12 pm

- Design the Future of Food
- Creating Iconic Audio Experiences
- Designing for Community Wellbeing
- Immersive Intelligence: Transforming Healthcare and Aviation Futures
- Innovating for Paediatric Care
- Intelligent Wearable Technology

Thursday 1 pm to 4 pm

- Automation and Robotics
- Aviation Studio
- Creative Media Technology Studio
- MedTech Innovation Studio
- Mental Wellness Studio
- Smart Solutions Studio
- Sustainable Innovation Studio

Self-proposed projects

- Self-proposed projects that are seeking team members:
  - AI-powered wearable vision assistant for the visually impaired
  - Autonomous drink mixing and serving system
  - FREESTRYDE: A predictive compression device for active lymphedema management

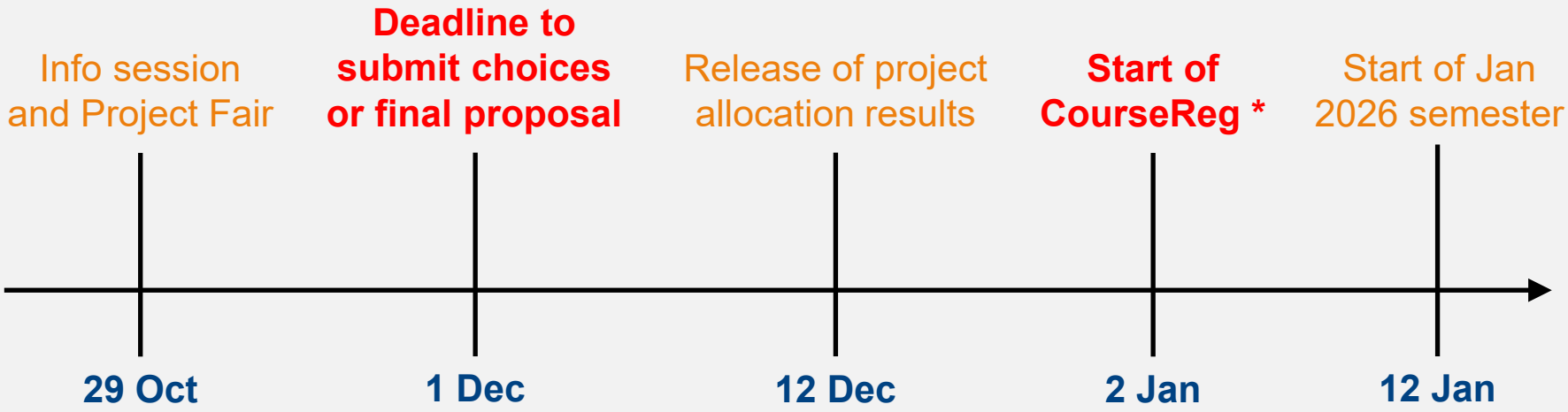
Check out their booths at E2A later!

CDE3301 project selection exercise

- Choose 5 topics ranked in order of preference.
  - Based on interest and availability for studio sessions.
  - We will try to allocate your preferred topics (subject to factors such as maximum number of students per topic and mix of disciplines).

- Self-proposed projects:
  - Submit final proposal (1-2 pages) with team composition.
  - Ideally aligned to the 14 studios / 5 themes and able to attend same studio sessions.

CDE3301 project selection exercise



* Classes (i.e. studio sessions) for CDE3301 will be pre-allocated.
Select classes for other courses that do no clash with studio sessions.

CDE3301 project selection exercise

- Notes for those in FSAE boot camp:
  - Selection of main FSAE team will only be done in end-December.
  - Choose one of the studios or a self-proposed project if you have decided not to be main FSAE team.
  - Choose one of the studio or a self-proposed project as back up if you are interested to remain in CDE3301 with other projects.

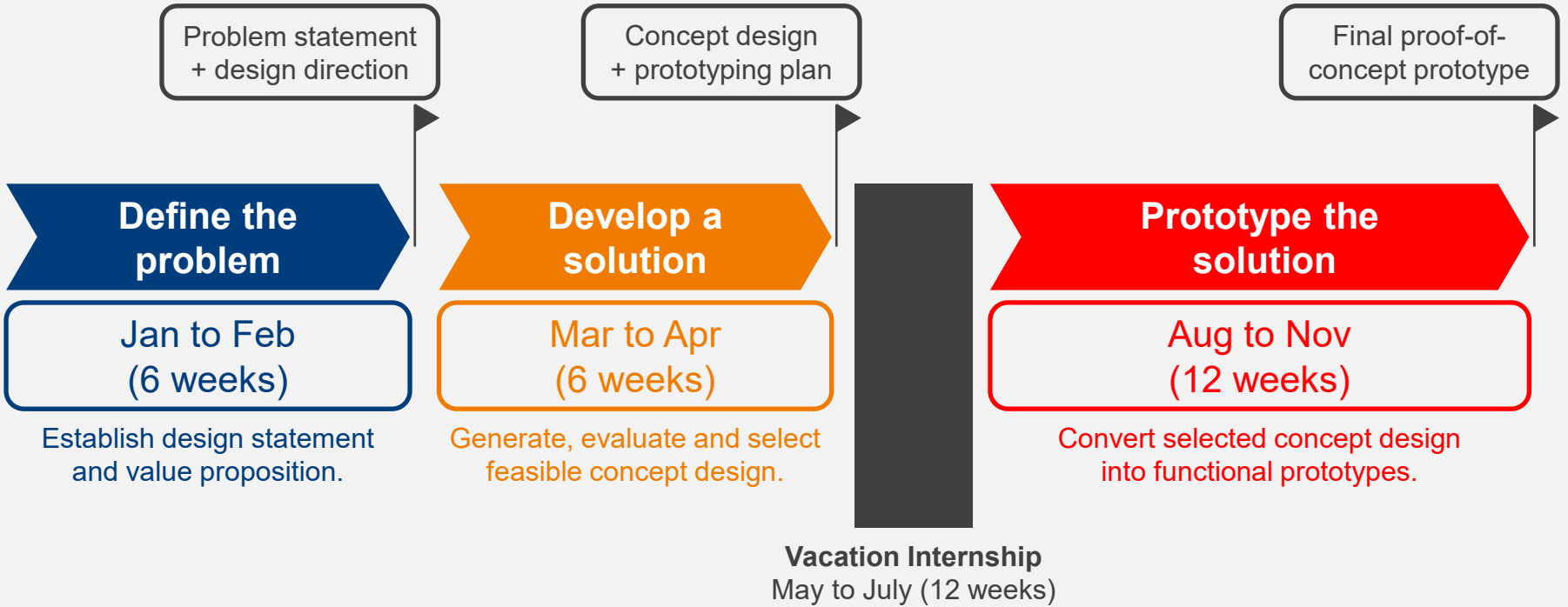
- Notes for self-proposed projects:
  - Final approval is subject to suitability of proposed topic and availability of supervisor.
  - Must form your own project group (3 to 5 members, preferably from at least 2 different disciplines) and have an NUS teaching staff who is agreeable to supervise.
  - Choose one of the studios as back up.

Team formation for project

- Project teams will be formed within each studio at a later date.
  - Based on choice of problem statements within each studio.
  - Based on choice of solutions to explore within each studio.
  - Handled by project supervisors.

- Interested to form your own project team?
  - Select same topics ranked in same order of preference.
  - Indicate proposed list of team members in the project selection form.
  - Final team formation is up to discretion of project supervisors.

CDE3301 course timeline



IA/SEP/NOC in August 2026 semester

- CDE3301 runs across two consecutive semesters, i.e. January 2026 and August 2026 semesters.
  - IA/SEP/NOC is **not allowed** concurrently with CDE3301.

- What if you are planning to go for IA/SEP/NOC in the August 2026 semester?
  - Complete second half of CDE3301 during Special Term (May to July 2026).
  - **Everyone** in your project team must complete CDE3301 together during Special Term — form a team with those who are going away in the August 2026 semester to work on the same project.
  - Not allowed to do credit-bearing vacation internship (VIA) or NOC concurrently with CDE3301 during Special Term.

CDE3301 studio topics (for 2026)

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What about other competition projects?

CDE3301C for competition projects

- Complex Systems Design: From Mission to Prototype
- Variant for CDE3301 for mission-driven competition projects:
  - Final deliverable: complex engineering system, tested in competitive scenario.
  - Emphasises systems engineering approach for development of complex engineering systems instead of the general product development process.
- Two-semester course, to be offered starting August 2026 semester:
  - August to April timeline to better suit competition timelines.
  - Year 2 Sem 1 + Year 2 Sem 2 or Year 3 Sem 1 + Year 3 Sem 2.
  - Must be in NUS for both semesters, not taking credit-bearing internship concurrently.

CDE3301C for competition projects

- Currently available only for students who have been selected for the following competition projects: (1) Bumblebee, (2) Calibur Robotics, (3) CanSat, (4) FSAE, (5) University Rover Challenge.

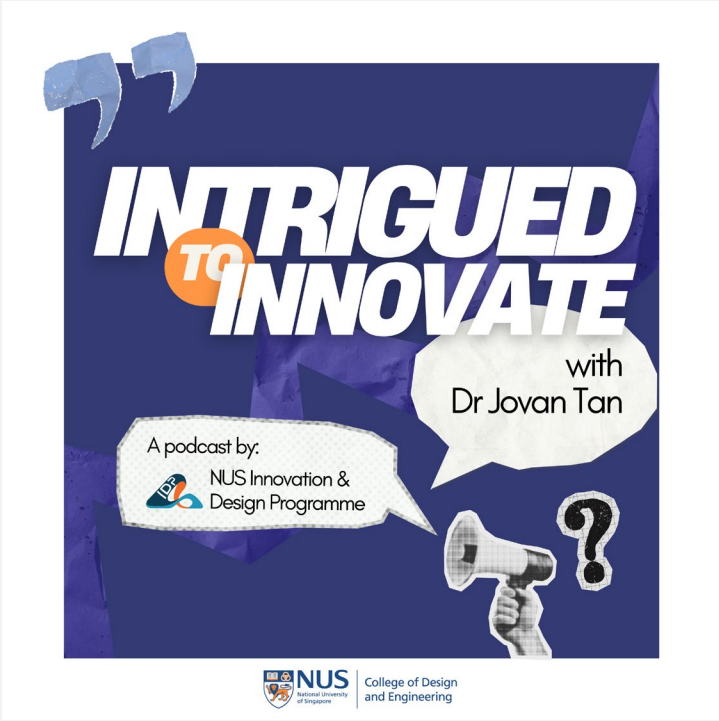
- How to sign up for CDE3301C?
  - FSAE: current trainees in the FSAE bootcamp who are selected for the main FSAE team will be automatically enrolled in the August 2026 and January 2027 semesters.
  - University Rover Challenge: can still enrol in regular CDE3301 for present cohort or choose to register for CDE3301C in the August 2026 and January 2027 semesters.
  - Other competition projects: inform your project supervisor / staff advisor by end of November if you plan to enrol in CDE3301C instead of the regular CDE3301.

EDIC Project Showcase

- See projects (and prototypes) done by your seniors, hear more from them about their experience in CDE3301.
- 14 November 2025 (Friday), 5 pm to 8 pm at Block EA Atrium.
- Register by 5 November 2025.
  - Refreshments will be catered.

Intrigued to Innovate podcast

- New podcast, 1st episode airing TODAY!
- Inspiring stories of young innovators developing creative solutions for complex, interdisciplinary real-world challenges.
- Featuring selected project teams from CDE3301, CDE4301 and CDE4301A.
  - Hear from your seniors about their experience and insights in CDE3301.



Location of project booths at E2A

Studio 1 (E2A-02-01)

- Aviation Studio
- Creating Iconic Audio Experiences
- Creative Media Technology
- Immersive Intelligence: Transforming Healthcare and Aviation Futures
- Intelligent Wearable Technologies

Studio 2 (E2A-03-01)

- Designing for Community Wellbeing
- Innovating for Paediatric Care
- MedTech Innovation Studio
- Mental Wellness Studio

Studio 3 (E2A-03-02)

- Design the Future of Food
- Sustainable Innovation Studio

Studio 4 (E2A-03-03)

- Automation and Robotics
- Smart Solutions Studio
- Space Systems Studio
- University Rover Challenge

- Enquire about internship opportunities with industry partners.
- Check out the booths for self-proposed projects in each studio too!

QUESTIONS?