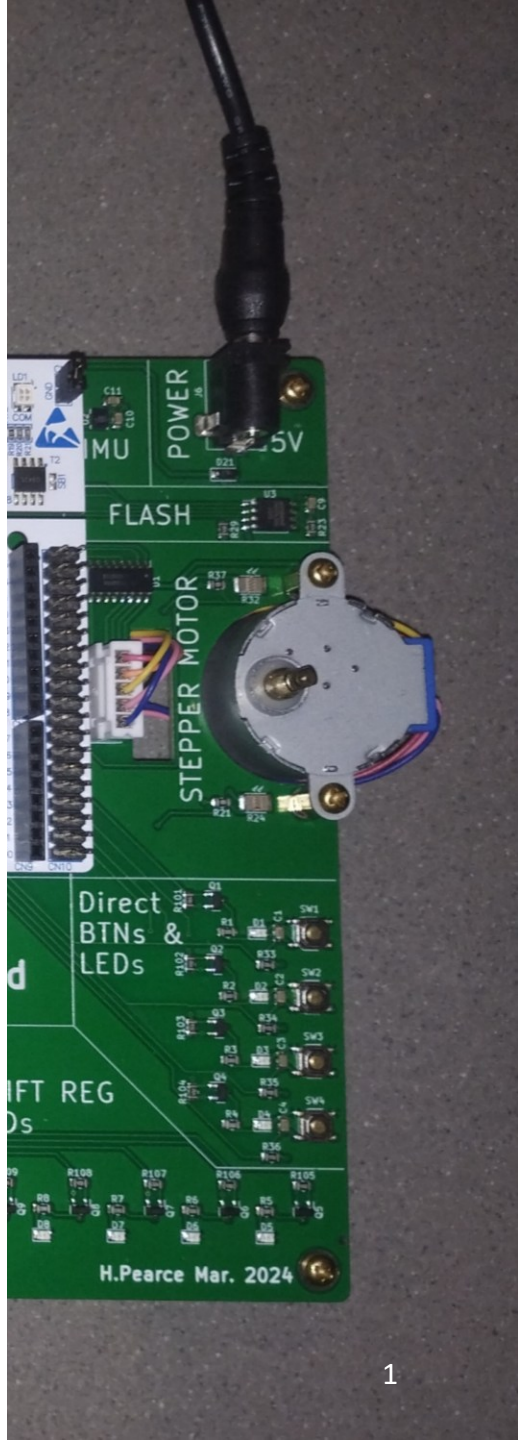
# DESN2000 (Computer Engineering) 2026 T2

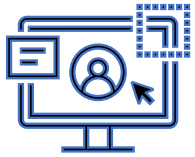
# Course Introduction

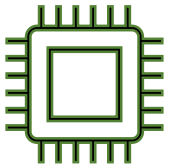
Hasindu Gamaarachchi



# DESN2000 (COMP Stream)

DESN2000 = Engineering Design + Technical Component





For computer engineering stream, it is about embedded systems design

- Stream Coordinator:
  - Dr Hasindu Gamaarachchi (myself)
  - hasindu+desn2000@unsw.edu.au
- Course Coordinator:
  - Ilpo Koskinen
  - ilpo.koskinen@unsw.edu.au

# Timetable (Lectures)

- Technical Lectures (in-person)

| Name | Staff | Day | Start Time | End Time | Weeks | Room |
|---|---|---|---|---|---|---|
| G | Hasindu Gamaarachchi | Mon | 09:00 | 11:00 | 1,3-5,7-10 | Tyree Energy Technology LG05 (K-H6-LG05) |
| | | Thu | 16:00 | 18:00 | 1-5,7-10 | Tyree Energy Technology LG07 (K-H6-LG07) |

- Design Lectures (online)
  - Was originally planned to be online on Mon 4.00pm-6.00pm
  - Ilpo Koskinen mentioned last week that it will now be an on-demand video

# Timetable (Labs)

| Name | Staff | Day | Start Time | End Time | Weeks | Room |
|---|---|---|---|---|---|---|
| M12A | Kavindu Jayasooriya<br>Suneth Samarasinghe | Mon | 12:00 | 14:00 | 1,3-5*,7-9 | Lyre Lab K17 (CSE) G12 (K-K17-G12) |
| W16C | William Chan<br>Kavindu Jayasooriya | Wed | 16:00 | 18:00 | 1-5,7-9 | Lyre Lab K17 (CSE) G12 (K-K17-G12) |
| H09B | William Chan | Thu | 09:00 | 11:00 | 1-5,7-9 | Lyre Lab K17 (CSE) G12 (K-K17-G12) |

*week 2 Monday is a public holiday, so the replacement lab for that week is Wed 09:00 - 11:00 Quadrangle G048 (K-E15-G048)

# Lab Demonstrators

- William Chan
  - william.chan5@student.unsw.edu.au
- Suneth Samarasinghe
  - suneth@unsw.edu.au
- Kavindu Jayasooriya
  - k.jayasooriya@unsw.edu.au

# Project work

If you wish, the following rooms have been reserved and may be used to coordinate project work with your teams

| Day | Start Time | End Time | Weeks | Room |
|---|---|---|---|---|
| Wed | 09:00 | 11:00 | 1,3-5*,7-10 | Quadrangle G048 (K-E15-G048) |
| Fri | 09:00 | 11:00 | 1-5,7-10 | Quadrangle G048 (K-E15-G048) |
| Fri | 13:00 | 15:00 | 1-5,7-10 | Quadrangle G048 (K-E15-G048) |

*week 2 is reserved for a replacement lab

# Communication

Course Material:

https://webcms3.cse.unsw.edu.au/DESN2000/26T2/

Forum:

https://discourse03.cse.unsw.edu.au/26T2/DESN2000/

# Assumed knowledge

- C programming language
- assembly language
- architectural layers of modern computer systems

assumed to have been acquired in COMP1521

- design concepts

assumed to have been acquired in DESN1000

# Content

- Designing embedded systems. We will cover several technical topics such as:
  - STM32 ARM microcontroller architecture and programming
  - General purpose Input/Output (GPIO)
  - I/O peripherals such as keypads and LCD
  - Interrupts
  - Timers
  - Analog Input/Output such as Analogue to Digital Converter (ADC) and Pulse Width Modulation (PWM)
  - Serial communication

# UNSW CoaST Education Board

# Lectures

- You are expected to attend all lectures
- Delivered face-to-face

This is a project-based course in which learning is driven by hands-on practice rather than passive listening. As a result, lecture sessions are primarily used for in-class activities rather than traditional lectures.

# Labs

- Groups of 3
- 2h sessions every week (except week 6 and 10)
- 4 sets of lab exercises (lab sheets)
  - 2 weeks for each set
- Lab demos will tell you more info during the first lab
- Lab resources:
  - https://webcms3.cse.unsw.edu.au/DESN2000/26T2/resources/121313

# Project

- A Smart Door
- Groups of 3 (same as lab groups)
- Detailed discussion in the next lecture
- See the project brief provided on webCMS
  - https://webcms3.cse.unsw.edu.au/DESN2000/26T2/resources/121363

# Design Assessments

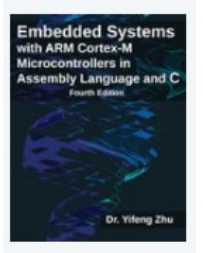
| Item | Weight | Assessment criteria | Due date |
|---|---|---|---|
| **Design Journal** | 20% | Refer to assessment guide (will be provided later in WebCMS) | 11:59 PM, Friday (Week 5) |
| **Design Presentation** | 20% | Refer to assessment guide (will be provided later in WebCMS) | Week 5 (during lecture hours) |

# Technical Assessments

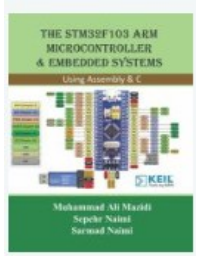
| Item | Weight | Assessment criteria | Due date |
|---|---|---|---|
| **Lab Exercises** | 30% | Refer to assessment guide (will be provided later in WebCMS) | End of Week 2, 4, 7, 9 labs |
| **Project implementation** | 30% | Refer to assessment guide (will be provided later in WebCMS) | 11:59 PM, Friday (Week 10) |

# Resources

1. Zhu, Yifeng, Embedded Systems with ARM Cortex-M Microcontrollers in Assembly Language and C




2. Sepehr Naimi, Sarmad Naimi, The STM32F103 ARM Microcontroller and Embedded Systems




- UNSW Leganto library reading list for these two textbooks:
  - https://unsw.alma.exlibrisgroup.com/leganto/public/61UNSW_INST/lists/7505302375000173 1?auth=SAML

# You are not alone!

## What to do in the event of a problem or concern with the course

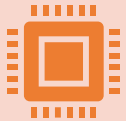
1. In the first instance, please try to resolve the issue with the **immediate party** - which in most cases will be your **tutor**
2. If unresolved, please escalate to the **course admins and lecturer**
3. If unresolved, please escalate to the CSE Student Representatives at **stureps@cse.unsw.edu.au** (or anonymously through our website)
4. If unresolved, please escalate to the CSE Grievance Officers at **grievance-officer@cse.unsw.edu.au**
5. If unresolved, please escalate to **UNSW Complaints** via the UNSW website

**Brought to you by the CSE Student Representatives** | **Find us at https://cgi.cse.unsw.edu.au/~stureps/**

# Where this DESN2000 sit in the degree

Program: Engineering (Honours)

https://www.handbook.unsw.edu.au/undergraduate/programs/2026/3707



Specialisation: Computer Engineering

https://www.handbook.unsw.edu.au/undergraduate/specialisations/2026/COMPBH

Course: DESN2000

https://www.unsw.edu.au/course-outlines/course-outline#year=2026&term=Term%202&deliveryMode=In%20Person&deliveryFormat=Standard&teachingPeriod=T2&deliveryLocation=Kensington&courseCode=DESN2000&activityGroupId=4

# DESN2000 (Computer Engineering)

## Course Learning Outcomes (CLO)

| CLO | Description |
|---|---|
| **CLO1** | Develop design concepts using standard methods to collect, assess and integrate end-user, stakeholder and project requirements. |
| **CLO2** | Validate the suitability of designs using standard technical methods while considering end-user and stakeholder contexts. |
| **CLO3** | Implement disciplinary technical theory and skills pertinent to the design project. |
| **CLO4** | Contribute to the work of a team and collaborate on the design project, including the implementation of organisational and interpersonal tools. |
| **CLO5** | Integrate project management techniques to plan, execute and complete an open-ended design project. |
| **CLO6** | Explain designs to various audiences using oral, written, and visual forms of professional and persuasive communication. |

# DESN2000 (Computer Engineering)

## Specialisation Learning Outcomes (SLO)

| SLO | Description |
|---|---|
| **SLO1** | Characterise, formulate, and solve problems in Computer Engineering using current techniques, and tools. |
| **SLO5** | Communicate effectively to all audiences whether practicing independently or in multidisciplinary teams. |

# DESN2000 (Computer Engineering)

Program Learning Outcomes (PLO)

| PLO | EA | Description |
|---|---|---|
| PLO3 | EA1.3 | In-depth understanding of specialist bodies of knowledge within the engineering discipline |
| PLO4 | EA1.4 | Discernment of knowledge development and research directions within the engineering discipline |
| PLO5 | EA1.5 | Knowledge of engineering design practice and contextual factors impacting the engineering discipline |
| PLO7 | EA 2.1 | Application of established engineering methods to complex engineering problem solving |
| PLO8 | EA 2.2 | Fluent application of engineering techniques, tools and resources |
| PLO9 | EA 2.3 | Application of systematic engineering synthesis and design processes |
| PLO10 | EA 2.4 | Application of systematic approaches to the conduct and management of engineering projects |
| PLO12 | EA 3.2 | Effective oral and written communication in professional and lay domains |
| PLO14 | EA 3.4 | Professional use and management of information |
| PLO15 | EA 3.5 | Orderly management of self, and professional conduct |
| PLO16 | EA 3.6 | Effective team membership and team leadership |

* PLOs directly map to Engineers Australia Competencies

# COMPBH Specialisation

- https://www.unsw.edu.au/content/dam/pdfs/engineering/general/resources/2026-03-engineering-education-specifications/compbh3707_engineering-specification_2026---website-version.pdf
- https://cgi.cse.unsw.edu.au/~compbh/