B1: Introduction to Projects

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Overview

The **B1 mini-projects** form part of the **B1: Engineering Computation** course.

- **B1 (theory)** consists of 12 lectures (weeks 1-3) and 3 classes (week 4).
- You will undertake a **"mini-project"** in weeks 5-8 and over the Christmas vacation; assessment is solely based on a **project report**.
- Projects are based on **MATLAB** and should take around **25 hours** to complete.
- You **must pass** B1 to proceed to the 4th year.

The Projects

Two projects are on offer. Both require **numerical optimization and programming skills**.

- Project A: Force on a Driven Lid over a Cavity
  - Prof. Wouter Mostert
- Project B: Optimization for Regression and Classification Models
  - Prof. Konstantinos Kamnitsas

Project Selection and Allocation

- **Log your preference** via a form (link can be found on Canvas).
  - Form opens: 09:00 on Friday (27 Oct.)
  - Form closes: 09:00 on Monday (30 Oct.)
- The allocation will not be on a first-come, first-served basis.
- The final allocation will be **balanced**, and will be completed as soon as possible.

Project Support

Project A

- Software Lab A/B, **Fridays** from 11:00-13:00 and 14:00-16:00 in weeks 5-8

Project B

- Software Lab A/B, **Thursdays** from 11:00-13:00 and 14:00-16:00 in weeks 5-8

Project Report

A **report** must be **submitted electronically** by **noon on Wednesday of 1st week in Hilary Term**.

Report format and content:

- Maximum length: 10 pages (including all diagrams, references, etc.)
- Pages must be numbered.
- Minimum margins (all around): 20 mm
- Font: Arial, 11 pt
- Line spacing: double

Submission details:

- Submit via Inspera (detailed info will be on Canvas).
- Penalties for late submissions: (1% for 4 hours; 10% for one day; 20% for two days; 50% five days)

Project Report

What should I put in my report?

Do...

- add descriptions of the algorithms used;
- provide evidence that the numerical procedures work (e.g., you might illustrate certain tests or "benchmarking" exercises);
- elaborate on any practical conclusions or insight that you have gained through your numerical studies.

Don't...

- add a huge amount of background material;
- copy out material from the handout, which can be assumed to be known to the reader.

Project Assessment

The reports will be marked by the **project supervisors**.

Oral examinations may be used in some cases to allow students to demonstrate how their code works.

The **examiners** will moderate to ensure consistency.

Marks will be returned in June/July along with other Part B marks.

Project Assessment

Marks

Engineering content *Presentation of the problem, methods, results, and discussion in an engineering context. Demonstration of appropriate engineering reasoning and analysis.*	**Mark (/20)**
Coding *Demonstration of basic functionality. Brief explanation of algorithms. Performance, accuracy and efficiency. Testing and verification.*	**Mark (/40)**
Exploration beyond standard problem as posed *Novelty of areas explored. Thoughtfulness of associated results and discussion. Suggestions as to how the work could be extended.*	**Mark (/10)**
Written report *Clear and efficient writing illustrated by suitable figures.*	**Mark (/30)**

Figure: Marks distribution for B1 reports.