# CoE 164

Computing Platforms

## Course Information

Academic Period: 2nd Semester AY 2024-2025

Units: 1

Workload:

- 3 hours laboratory per week

Instructors:

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Synopsis: This course aims to 1) build and evaluate efficient computing platforms, 2) present algorithms, methods, and tools needed to solve challenging problems, and 3) practice sound engineering judgment in solving engineering problems.

Delivery Method: Digital materials and open-time laboratory sessions

Online Platforms: UVLe, Google Meet, Zoom, other quiz platforms, other code submission platforms

## Course Outline

| Week | Topics | Expected Academic Requirements |
|---|---|---|
| 1 (27 Jan) | ➔ Course overview<br>➔ Course requirements<br>➔ Rust: First program | |
| 2 (Feb) | ➔ Rust: Language basics<br>➔ Rust: Functions and control<br>➔ Rust: Data ownership | SE |
| 3 | ➔ Rust: Data structures<br>➔ Rust: Error handling | SE |
| 4 | ➔ Rust: OOP basics<br>➔ Rust: Generic types | SE |
| 5 | ➔ Rust: Lifetimes<br>➔ Rust: Functional Programming<br>➔ Rust: Smart Pointers | SE |

| Week | Topics | Assessment |
|---|---|---|
| 6 (Mar) | ➜ Rust: Modules and crates<br>➜ Rust: Unit tests<br>➜ Rust: File I/O<br>➜ Test-driven development | SE |
| 7 | ➜ Optimized Linear Algebra<br>➜ Error correction (Reed-Solomon) | SE |
| 8 | | |
| 9 | ➜ MidP Briefing | MidP |
| 10 (Apr) | ➜ Runtime profiling and complexity analysis<br>➜ Language interpreter | SE |
| 11 | | |
| 12 | **LENTEN BREAK** | |
| 13 | ➜ Threading and concurrency<br>➜ Rust: Concurrency<br>➜ Rust: SIMD | SE |
| 14 | ➜ Rust: Unsafe mode<br>➜ Rust: Embedded basics | |
| 15 (May) | | CP |
| 16 | | |
| 17 | **END OF CLASSES** | |
| 18 | **FINALS WEEK** | |

## Grading Rubric

50% Software exercises (SE)
30% Midterm problem (MidP)
20% Capstone problem (CP)

Students are required to fulfill the following requirements for *course completion*. Failure to fulfill any of these requirements will result in receiving an INC (with passing standing) or 5.0 (with failing standing) in the course.

➜ Have a grade in at least half of the SEs offered throughout the semester

- ◆ "Having a grade" is defined as an SE that has a grade of greater than zero (0).
- ◆ If the SE has multiple subcomponents, each component is *not* counted separately but instead treated as one single SE.
- ◆ E.g. SE01 which has two components SE01A and SE01B, are counted as one for this requirement. Hence, you can opt to submit SE01A, SE01B, or all of them.
- ➔ Have a grade in the MidP
- ➔ Have a grade in the CP

## Numerical Grading Scheme

| Min (inclusive) | Max (exclusive) | Numerical Grade |
|---|---|---|
| 92 | +∞ | 1.00 |
| 88 | 92 | 1.25 |
| 84 | 88 | 1.50 |
| 80 | 84 | 1.75 |
| 76 | 80 | 2.00 |
| 72 | 76 | 2.25 |
| 68 | 72 | 2.50 |
| 64 | 68 | 2.75 |
| 60 | 64 | 3.00 |
| 0 | 60 | 5.00 |

## Academic Requirements Submission Guidelines

### General

- Assessments will have a deadline <u>at the earliest one week (7 days) after</u> the day of release. Weekends and holidays are included in the count.
- Each of the requirements will have details when the deadline will be.
- Deadlines will always be at <u>11:55 PM, GMT+8 (Philippine Standard Time)</u> of that date.
- Deadlines will *never* fall on weekends, holidays, or reading breaks.
- All academic requirements should be submitted via UVLe unless otherwise stated in the specifications.
  - ○ A submission bin will be provided to upload the requirements, which instructors will give a grade to that at the earliest a week after submission

- - *Public* test files are provided for everyone to test their own code especially against functional specifications. However, assessments are checked against *hidden* test files, which are exactly the same as the public test files with added routines to test for edge cases.

## Late

- Late submissions may be entertained.
  - All submission bins are open until one (1) day *after* the end of classes on Friday, 23 May 2025.
  - Anyone can upload their assessments, late or not, to the respective bins on or before this date and UVLe will take note of the modified date of the submission bin.
- Students may opt to contact their instructor of the reasons for submitting late. The instructor will then take note of the late submission and decide on what action to take.
- With the deadline for submission of grades scheduled on 09 June 2025, we can only accept late submissions until Monday, 02 June 2025. Any submissions after that date will not be entertained and will not be factored into your total grade.
- Instructors will impose the following deduction scheme for late submissions:
  - Guidelines for late SE submission
    - TL;DR: deductions increase every week a submission is not yet received and capped at 50%. Deductions work by multiplying the non-late grade with a "discount" factor.
    - If requirements are submitted *very* shortly after the deadline (i.e. less than 24 hours), scores will be reduced to 95%.
      - For example, if you got a perfect score in an SE, you only get 95%.
    - If requirements are submitted shortly after the deadline (i.e. less than 7 days), scores will be reduced to 90%.
      - For example, if you got a perfect score in an SE, you only get 90%.
    - If SEs are submitted at least one week (i.e. 7 days or more) late but before the CP is released, your score will be computed as follows:
      - Let $d_{w0} = 90\%$ be the reduction given when a requirement is submitted in less than 7 days and $d_{wcp} = 50\%$ be the reduction given when a requirement is submitted past the CP release date.
      - $g_{late} = s(1 - [(1 - d_{w0}) + [d_{w0} - (1 - d_{w0})]\frac{w}{c}])$, where $s$ is your original score, $w$ the number of weeks late, and $w_{ref}$ the number of weeks between the deadline of the said SE and CP
      - One week is equivalent to seven (7) days, including weekends and holidays.

- - - - ○ If the SE was submitted 13 days after the deadline, it is counted as one (1) week late.
          ○ If it was submitted 14 days after (i.e. after 11:55 PM of the 14th day), then it is two (2) weeks late.
      - A day is counted once 11:55 PM, GMT+8 (Philippine Standard Time) of that day has passed.
    - If SEs are submitted late but <u>at the time or after</u> the CP is released, scores will be reduced by half.
      - For example, if you got a perfect score in a SE, you only get 50%.
    - An equation best describes the score once late is as follows
      - $g_{late} = su(-w)$

        $+ s0.95[u(w) - u(w - \frac{1}{7})]$

        $+ s0.9[u(w - \frac{1}{7}) - u(w - 1)]$

        $+ s[d_{w0} - (d_{wcp} - (1 - d_{w0}))\frac{w}{w_{ref}}][u(w - 1) - u(w - w_{ref})]$

        $+ s0.5u(w - w_{ref})$
      - $\delta(x)$ is the Dirac delta function (impulse) and $u(x)$ the right-continuous Heaviside step function ($u(0) = 1$)
      - Sample plot for $g_{late}$ versus $w$ for $w_{ref} = 5$
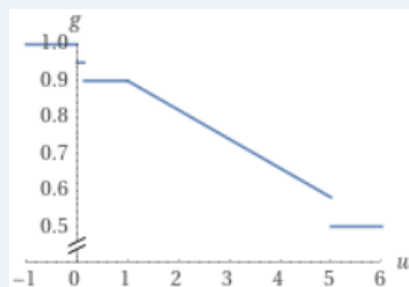


  - ○ Guidelines for late MidP submission
    - If the MidP is submitted <u>after the deadline,</u> scores will be reduced to 60%.
      - For example, if you got a perfect score in the MidP, you only get 60%.
  - ○ Guidelines for late CP submission
    - If the CP is submitted <u>after the deadline,</u> scores will be reduced to 75%.
      - For example, if you got a perfect score in the CP, you only get 75%.
- Submission platforms usually have certain instructions, such as how to upload the files, which form the files should be, and how to fill-out the necessary forms. Failure to comply with the instructions will result in the final grade of the offending submission reduced by 5%.
  - ○ For example, if you got a perfect score in an SE, you only get 95%.

- Multiple deductions in a submission add up. This means that each deduction is first computed against the no-deduction score. Then, all of these deductions are added and finally subtracted against the no-deduction score to yield the final score for the submission.
    - For example, if you got a 5% deduction for not following the submission instructions and a reduction of score to 90% due to a late submission, the total reduction would be to 85%.

## Academic Ethics Guidelines
- Academic dishonesty is strictly frowned upon. This includes one-to-one copying of segments or whole source codes from other colleagues from the past, present, and future.
    - There is no problem with collaborating among colleagues, but note that it is different from outright copying.
    - Note that it is better to cite where you got your code snippets so that instructors may be informed. Up to 25% of the source code may be derived from outside sources.
    - **For AI enthusiasts**, usage of any generative software to provide raw answers to assessments is forbidden.
- By taking this course, you consent to the instructors having the right to upload your anonymized submissions to a third-party similarity checker.
- Allegedly dishonest students will be subject to investigations and possible delay in upload of grades to CRS.
    - Guilty students will face a case with the Office for Student Ethics (OSE) if strong evidence has been collected.
- Students have the obligation to inform the instructors if they have any difficulties fulfilling the requirements due to material problems, overloaded academic work, and others.