COMP3161/COMP9161
Concepts of Programming Languages

Course Goal

To educate students on

- semantics of different programming paradigms: imperative, object oriented, and declarative;
- theoretical foundations of programming languages: syntax, operational, axiomatic and denotational semantics; and
- implementation aspects of central language features, such as dynamic and strong typing, polymorphism, overloading and automatic memory management

Course Prerequisites

- COMP3161: COMP2011 or COMP2711
- COMP9161: COMP9024

Course Exclusions

- COMP3161: COMP9161
- COMP9161: COMP3161

Constituents

- **Lecture**

  The lectures will cover the following main topics:
  - An overview of the history of programming languages
  - An overview of the implementation of programming languages
  - First order and higher order syntax of Programming languages
  - Static and dynamic semantics of programming languages
  - Abstract machines
  - Polymorphism and overloading
  - Case studies using simplified variants of various programming languages

- **Tutorials**

  Tutorials start in Week 2. They will discuss problems related to the material covered in the lecture and the assignments.

- **Assignments**

  There will be two assignments, due approximately in Week 8 and Week 12.

  Penalty for late submission of assignments will be 4% (of the worth of the assignment) subtracted from the raw mark per day of being late. In other words, earned marks will be lost. For example, assume an assignment worth 25 marks is marked as 20, but had been submitted two days late. The late penalty will be 2 marks, resulting in a mark of 18 being awarded. No assignments will be accepted later than one week after the deadline.

Assessment

- ### Tutorial Participation Mark (COMP3161)

  Tutorial marks will be awarded based on participation (no marks for just attending). Tutorial problems will be handed out in advance and students will be asked to present the solution.

- ### Mid-session exam

  A mid-session exam will be held in Week 5

- ### Assignments

  - Assignment 1: will be out approximately in Week 5
  - Assignment 2: will be out approximately in Week 9

- ### Final Exam

  A two hour written final examination will be conducted.

Supplementary Exam

Supplementary exams will only be awarded in well justified cases, in accordance with School policy, not as a second chance for poor performance. In particular, it is unlikely that a supplementary will be awarded to students who have actually sat the proper exam. Moreover, a supplementary exam will only be granted to students whose performance during the semester is of a satisfactory standart and when the student has submitted a fully documented request for Special Consideration within 3 working days of the exam.

Please refer to the sections under the heading Special Consideration - Illness & Misadventure and CSE Supplementary Assessment Policy on the Yellow Form for further details.

Supplementary exams will be oral. The supplementary final exam will be held after the written supplementary exams held for other courses.

- ### Final Mark

The final mark is computed as follows:

- COMP3161 students: the class mark consists of the tutorial participation mark (20%), mid-session exam (20%) and assignments (60%). The arithmetic mean of the class mark and exam mark is used to determine the final mark. To pass the course, a minimum of 40% is necessary in each component.
- COMP9131 students: the class mark consists of the mid-session exam (25%) and assignments (75%). The arithmetic mean of the class mark and exam mark is used to determine the final mark. To pass the course, a minimum of 40% is necessary in each component.

If both the class mark and the exam mark are greater or equal to 40%, the final mark will be

> (class mark + exam mark) /2

otherwise

> minimum ((class mark + exam mark) /2, 44)

- ### Plagiarism

Please note that we will check for plagiarism and read the item on the Yellow Form regarding the originality of Assignments. Assignments are individual assignments and teamwork is not permitted. Penalties include 0F for copying code, negative or 0 marks for the assignment in case of team work, depending on the severity.

Text and Reference Books

Most lectures will be based on

- *Programming Languages: Theory and Practice*, Robert Harper (Draft)

Supplementary reading:

- *Types and Programming Languages*, Benjamin C. Pierce

Gabriele Keller
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