Department of Computer Science and Software Engineering

COMP 348/1 AA   Principles of Programming Languages (3 credits)

1. General Information

- Course: COMP 348/1 AA - Principles of Programming Languages (3 credits)
- Lectures: Monday and Wednesday, 14:45 – 17:15, **H-620**
- Instructor: Jamal Bentahar, *Ph.D., P.Eng.*, Concordia Institute for Information Systems Engineering, ENCS.
- Office: EV7.630, extension 5382, bentahar@ciise.concordia.ca
- Office Hours: Thursday from 11:00 a.m. to 12:00 p.m.
- Course Website: http://www.ciise.concordia.ca/~bentahar/comp348.html

2. Course Description

- This course teaches the principles of programming languages and basic skills needed to understand, analyze and develop algorithms for problem solving using different paradigms. Examples from mathematics, data structures and logic will be given and discussed. The following programming paradigms will be covered: logic, functional, procedural, imperative, object-oriented, and aspect-oriented.
- This course stresses and develops the CEAB (Canadian Engineering Accreditation Board) graduate attribute of **problem analysis**. The attribute is defined by CEAB as follows:
  Problem analysis: An ability to use appropriate knowledge and skills to identify, formulate, analyze, and solve complex engineering problems in order to reach substantiated conclusions.
  Problem analysis is a fundamental part of software engineering. It includes the process of understanding a real-world problem and proposing solutions to meet the requirements. The ultimate goal is to have a better understanding of the problem being solved before starting its coding in different programming paradigms. The course lectures will provide many examples of problems that need to be formulated and analysed before being coded. These examples are taken from discrete mathematics, data structures, logics, and theory of computation. The required textbook covers problem analysis in all the chapters before providing the solution (the code) in different programming languages. In this course, the class as a whole will be assessed on the problem analysis attribute by means of assignments and midterm and final exams.
- Prerequisites: COMP 248 or COMP 249 and COMP 238.

3. Learning Outcomes

- By the end of this course, students should be able to:
    1. Understand the differences between different programming paradigms.
    2. Analyse problems and develop algorithms for problem solving.
    3. Develop programs in different programming languages.

4. Schedule

- Weeks 1 & 2: Logic Programming with Prolog.
- Weeks 3 & 4: Functional Programming with Lisp.
- Week 5: Object-Oriented Programming with Common Lisp Object System.
- Week 6: Object-Oriented Programming with Ruby.
- Week 7: Object-Oriented Programming with Java.
- Week 7: Separation of Concerns and Aspect-Oriented Programming.

5. Course Materials

- Textbook:
    - **Principles of Programming Languages 2011-2015's Edition (Coursepack by Dr. C. Constantinides)**
- Readings:
    - Learning Ruby
        - Author: Michael Fitzgerald.
        - Publisher: O'Reilly, 2007.
    - ANSI Common Lisp
        - Authors: Paul Graham.
        - Publisher: Prentice Hall, 1996.
    - Programming Language Pragmatics
        - Authors: Michael L. Scott.
        - Publisher: Elsevier, 2009.

6. Assignments and Grading

- **Assignments:**

1. Assignment (1):   15%
2. Midterm Exam: 35%
3. Final Exam: 50%

- **Details:**
1. Homework Assignment (1): must be done in groups of 2. Due date is: June 3rd, 2015.
Late assignments suffer a penalty rate of 20% per day, up to 5 days (weekends count towards the 5 days).
Assignments that are more than 5 days late are penalized by 100%. The solutions will be posted on the course website. **No submissions will be allowed after the solutions are published.**
Submit the signed **Expectations of Originality form** with the homework assignment.
2. Midterm Exam: will focus on the first 5 Lectures.
3. Final Exam: will take place during the examination period at the end of the semester. Students should not make any specific arrangements to leave the city until the final exam date is posted.

- **Failing Grade:**
Plagiarism, absenteeism, lack of preparation, and lack of effort will result in a failing grade.

7. Academic Code of Conduct

Academic Integrity

Any form of cheating, plagiarism, personation, falsification of a document as well as any other form of dishonest behaviour related to the obtention of academic gain or the avoidance of evaluative exercises committed by a student is an academic offence under the Academic Code of Conduct and **may lead to severe penalties up to and including suspension and expulsion.**
As examples only, you are not permitted to:
- Copy from anywhere without indicating where it came from
- Let another student copy your work and then submit it as his/her own
- Hand in the same assignment in more than one class
- Have unauthorized material or devices in an exam. Note that you do not have to be caught using them – just having them is an offence
- Copy from someone else's exam
- Communicate with another student during an exam
- Add or remove pages from an examination booklet or take the booklet out of an exam room
- Acquire exam or assignment answers or questions
- Write an exam for someone else or have someone write an exam for you
- Submit false documents such as medical notes or student records
- Falsify data or research results

You are subject to the Academic Code of Conduct. Take the time to learn more at
http://provost.concordia.ca/academicintegrity/

8. Student's Responsibilities

- Students are expected to attend every class. Some material may only be covered in class and not made available on the course website. Students are expected to read the assigned material and to actively participate in class discussions.

- Students are expected to be respectful of other people's opinions and to express their own views in a calm and reasonable way. Disruptive behaviour will not be tolerated.
- Students are expected to be familiar with the Code of Rights and Responsibilities:
  http://rights.concordia.ca
- If you cannot attend class for any reason, unforeseen or not, you are to come and talk or write to me as soon as possible.

9. Student Services

- **Concordia Counselling and Development** offers career services, psychological services, student learning services, etc.
  http://cdev.concordia.ca
- **The Concordia Library Citation and Cycle Guides:**
  http://library.concordia.ca/help/howto/citations.html
- **Advocacy and Support Services:**
  http://supportservices.concordia.ca
- **Student Transition Centre:**
  http://stc.concordia.ca
- **New Student Program:**
  http://newstudent.concordia.ca
- **Office for Students with Disabilities:**
  http://supportservices.concordia.ca/disabilities/
- **The Academic Integrity Website:**
  http://provost.concordia.ca/academicintegrity/