APS145
Applied Problem Solving &
Computational Thinking

Course Introduction

About Me – Jacky Lau, CD, MASc, PEng, PMP

- PhD Student, Mechanical Engineering, University of Toronto
  - MASc, Mechanical Engineering, University of Toronto
  - BASc, Mechanical Engineering, University of Toronto

- **WAS:** Supervisor, Functional Test Control Team, Bombardier Aerospace

- **WAS:** Manager, Project Engineering, Canada Robotix

- Section Commander, Canadian Armed Forces Reserve

- President and Chair of the Board, CAROBOT Learning and Research Organization

- Professional Engineer (P.Eng), Professional Engineers Ontario

- Project Management Professional (PMP), Project Management Institute

- Programmed in C/C++, Java, VBA, SQL, PHP, HTML, CSS, BASIC…

Problem Solving and Computational Thinking

- **<u>Co-requisite</u>** course with IPC145 required for entry into OOP244
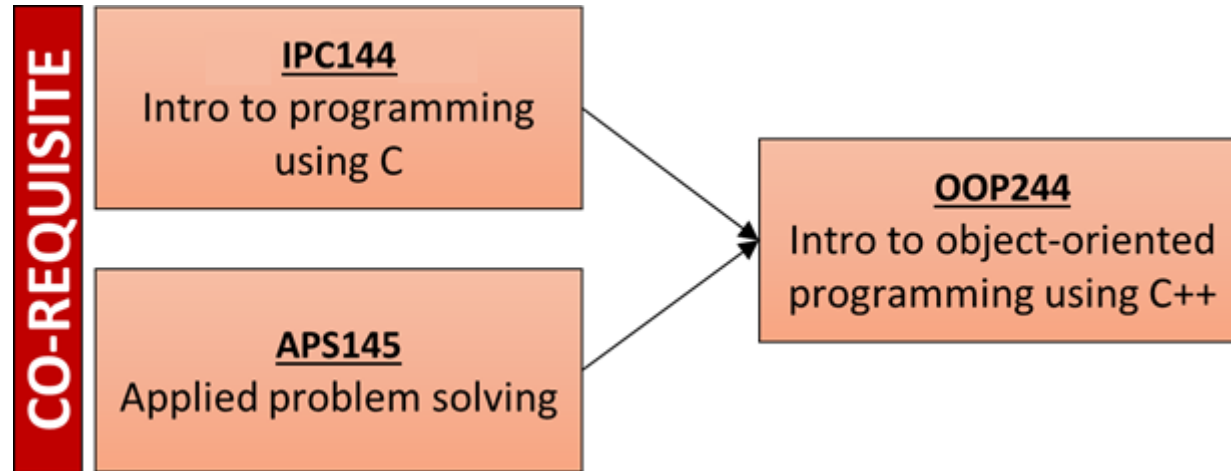
- **<u>Purpose</u>**: Designed to bring out and build upon your logic & problem solving (computational thinking) abilities

- **<u>Programming requires a different mindset</u>** and these labs will put you on the road to **<u>thinking like a programmer</u>** (without coding)

Course Grading and Promotion Policy

Course Breakdown:

Workshops (in-class only):
- Group work (minimum 8 workshops)   40%
- Solution Presentation (minimum 1)   15%

Quizzes (minimum 3)   30%

Assignments (Vretta Math Component)   15%

                                                100%

1. Successfully complete a minimum of 8 workshops <u>and</u> a minimum of 1 presentation

2. Achieve a minimum average of 50% on quizzes

3. Successfully complete all assignments (online VRETTA mathematics component)

4. Achieve a minimum overall course average of 50%

Workshops (55%)

Group Work (40%)

- There will be a total of **10 workshops** this term

- You must **attend** and **complete** a **minimum of 8**

- If you complete more than 8 workshops, your mark will be calculated based on your **BEST 8**

- **No make-up workshops will be available** – it is up to you to be sure to complete a minimum of 8

Presentation (Video) (15%)

- Each student **MUST present at least 1 (one) solution** (worth 15%)

- If more than 1 presentation is done, the best grade will be applied

A Typical Workshop Class

1. Students will have pre-submitted their individual and group work by 08:00 on the day of the workshop.

2. During class time, the instructor will visit each group and provide feedback on the individual and group work and mark it.

    NOTE: See grading rubric for <u>workshop</u> expectations

5. <u>One group member will present a video of the solution due by 23:59 on the day after the workshop </u>(**5-minutes maximum!**)

    NOTE: See grading rubric for <u>presentation</u> expectations

Groups

- You will be assigned to a group – once at the beginning of the semester and once after the midterm break.

- Each team will have (ideally) 6 members who each have a number.

- Each workshop will detail the duties assigned to each member of the group based on their assigned number in the group.

Sample Workshop Duties

Task	Subtask	Member(s)	Marks	Comments
Pseudocode	Logic 1	1	40%	
	Logic 2	2	40%	
	Logic 3	3	40%	
	Combined	1-3	60%	
FlowChart	Logic 1	4	40%	
	Logic 2	5	40%	
	Logic 3	6	40%	
	Combined	4-6	60%	
Video	Presentation	1 or 4	100%	Members rotate weekly

Quizzes (30%)

- There will be three (3) quizzes this term

- Quizzes will be done on week's 5, 8, and 12

- Each is worth 10% of the term mark

- Quizzes will be due at 23:59 on the day after your workshop

- Normal workshop class work will occur in class time (scaled down as there will be less time available)

Assignments (15%)

- Your only **homework** will involve an online numeracy module to be done on your own time Unfortunately, there's an $8 fee to register.

- This is an **online module** hosted by VRETTA (publisher)

- You **must successfully pass the module by the end of the term**

- Each student will have a customized experience

- The material you focus on will be based on a pre-assessment

- Areas of weaknesses will be concentrated on with extra instruction/practice