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|  | **CS 126 – Principles of Programming II using C++**  **Academic Year 2018/2019**  **Second Semester**  **Credits: 3** |

**Instructor information**

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| **Name** | Flordeliza “Flor” P. Poncio |
| **Contact Info** | fponcio@paragoniu.edu.kh |
| **Office location** | Room 219 |
| **Office hours** | 8:00 am – 12:00 / 1:00 – 5:00 pm |

# **Course Description**

* This course aims to enhance the programming and analytical skills of students so that they will be able to produce programming solutions to typical programming problems. In this course, concepts of multi-dimensional arrays and strings will be discussed further, different sorting and searching algorithms will be covered as well. Discussions and illustrations will focus on functions, classes, Abstract Data Types, IO libraries, Sequential Containers, and Lambda expressions.
* Prerequisite courses: CS 125

# **Learning Objectives**

At the end of the course, the students will be able to:

* develop and understand the behaviors of programs that involves at least one user-defined class.
* implement and apply simple searching and sorting algorithms.
* handle data programs by using input and output libraries and files
* manifest their innovative character through problem solving exercises.
* be oriented with ways of acquiring updated knowledge in the field of programming.

# **Learning Outcomes:**

* A simple program for each of the major topics or themes.
* A functional program that implements most of the topics covered in this course.

# **Learning Resources**

* Books:
  + Lippman, S., Lajoie, J., Moo, B., (2013). *C++ Primer.* FifthEdition*.* ObjectiveWrite, Inc.
  + Stroustrup, B. (2013). *The C++ Programming Language.* Fourth Edition. Pearson-Education, Inc.

# **Assessments**

The final course grade will be calculated using the following categories:

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| **Assessment** | **Percentage of Final Grade** |
| Laboratory Exercises | 10% |
| Quizzes | 10% |
| Midterm Exam | 20% |
| Portfolio | 20% |
| Attendance | 10% |
| Final Exam | 30% |

* Laboratory Exercises: The students are given laboratory activities at the end of every topic. The student will get a perfect score, if all required functionalities were met. Some points are given if some are functional. Two, otherwise.
* Quizzes: Two quizzes will be given for midterms, and two for finals. Problem sets will be given.
* Midterm Exam: The midterm examination is composed of two parts, 50% is written and 50% is a hands-on exam.
* Portfolio:
  + Any project using C++ programming language
    - Games (Any)
* Functionalities (Score of players, Controls, “some GUI”)
  + - Phonebook Management System
    - Student Record Management System, etc...
* Functionalities (Add, Edit, View, Search)
  + Individual
  + Project description (One or two pages)
  + Save project in .zip file format, and send to fponcio@paragoniu.edu.kh.
  + Due: on or before June 14, 2019, during class.
* Attendance: Attendance will be monitored.
* Final Exam: The final exam will be given in multiple choice questions, and problem sets.

Students will be assigned the following final letter grades, based on calculations coming from the course assessment section.

# **Grading Policies**

* **Late-work policy**: Laboratory activities and portfolios are accepted even after due date. A demerit of 25% from the total score will be given if submitted after 24 hours, 50% after 48 hours.
* **Make-up work policy**: Make-up work is given to a student with a valid reason, present necessary documents like a medical certificate...
* **Attendance and/or participation policy**: Attendance will be monitored. Students need to sign in the attendance sheet.

# **Course Policies**

* **Attendance & Participation**: Attendance monitoring is in conformance with the university policy.
* **Academic Integrity & Collaboration**: All members of the academic community at Paragon International University are expected to take responsibility for academic honesty and integrity. Plagiarism and all other forms of cheating are unacceptable.
* **Mobile Devices**: As we are part of the information age, access to mobile information is permissible. Copy of slides and/or lecture notes will be shared to the students, allowing them to use it in class. Mobile phones are not allowed during assessments and exams

# **Course Schedule**

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| **Weeks** | **Theme/Topic** | **Contents** | **Assignments/Assessments** |
| Week 1 | Introduction | * Course Introduction * Class Orientation * Diagnostic assessments * Evaluation |  |
| Week 2 | Arrays and Strings | * One Dimensional Array * Elements of an Array * Defining & Initializing * Pointers and Arrays * Sorting Algorithms | Read on the Different Sorting Algorithms |
| Week 3 |  | * Two-dimensional array * Multi-dimensional array | Laboratory Activity |
| Week 4 |  | * Strings * Defining & Initializing * Operations * Iterators | Laboratory Activity |
| Week 5 | Statements and Functions | * Control structures overview * Try Blocks and Exception Handling * Functions * Passing arguments by Value * Passing arguments by reference * Built-in vs User-Defined Functions * Recursive Functions | Laboratory Activity  Quiz |
| Week 6 | Classes | * Defining Abstract Data Types * Designing classes * Constructors * Access control and encapsulation * Friends |  |
| Week 7 |  | * Additional class features * Functions that return \*this * Class Types * Class scope * Implicit Class-Type Conversions | Laboratory Activity  Take Home Quiz |
| Week 8 | Midterm Week | Midterm Examination | Midterm Examination |
| Week 9 | The IO Library | * The IO Classes * File Input and Output * Using File Stream Object * Output buffer * File Modes | Laboratory Activity |
| Week 10 | Sequential containers | * Container Library Overview * Iterators * Container Type Members * Defining and Initializing Operators | Quiz |
| Week 11 |  | * Sequential Container Operations * Accessing and Erasing elements * Numeric Conversions | Laboratory Activity |
| Week 12 | Generic Algorithms | * Overview * Customizing Operations * Lambda Expressions * Lambda Captures and Returns | Laboratory Activity |
| Week 13 |  | * Structure of Generic Algorithms * The five iterator categories * Overview of the Associative Containers * Operations on Associative Container Iterators * The Unordered Containers | Laboratory Activity  Quiz |
| Week 14 | Final Week | Final Review | Submission of Final requirements |
| Week 15 | Final Week | Final Examinations | Final Examinations |