

# Object-Oriented Programming (OOP)

This module on object-oriented programming is intended for engineering degree students.

To go through this course, you're expected to have some basic computer programming knowledge (preferably C).

Object-oriented programming (OOP) is a programming technique that evolves from the more common procedural/modular programming. In procedural programming a solution usually revolves around breaking down a task into smaller ones and writing a function (or procedure - hence the word procedural) specifically to deal with each of that (usually single) small task. Thus, you see a lot of functions that takes data structure (usually in form of a pointer) as an argument. In contrast, object-oriented programming focus more on modelling a solution as an object - which can be an instance of a more generic category. As an object, the solution would have properties (merely a variable in procedural programming) that describes the object, and methods (functions in procedural programming) which are processes used to model how an object acts/reacts. Based on this, it is clear that object-oriented programming is a technique and not just language. So, writing a program in C++ (or using a C++ compiler) still doesn't qualify as implementing object oriented programming - it is still possible to write a solution purely based on modular programming using C++ (especially when the all classes have public members only).

The main features of OOP are encapsulation, inheritance and polymorphism. The page on [wikipedia](#) also list others, but I feel those can actually be sub-categorized under (or stems from) the mentioned features. So, a language that supports these features should qualify as a language that supports OOP (i.e. enables implementing a solution using OOP technique). C++ and Java are the early popular implementations (C++ because of its roots in C and Java because.... well, it's Java! Maybe also because it's among the first to promote cross platform implementation).

*To be continued...*

 [Read more @ wikipedia](#)

## Structured Programming

*coming soon...*

## Development Environment

*coming soon...*

## Part 00: Introduction to OOP

## Objective(s):

To familiarize with terms and stuffs in object-oriented programming. Also, basic transition from C to C++ will be demonstrated.

## What is OOP?

It is a programming paradigm (or programming style, if you please) that focuses on modelling solution components as objects, rather than concentrating on the solution procedures. Obviously, it is not a new language - but it does need proper language support (i.e. constructs) in order to implement the concept. Some may use a language that supports OOP but still use modular or simply procedural programming.

*to be continued...*

## Why OOP?

1. (lec) course briefing and refresh basic programming
2. (lec) implementation platform revised (c++ instead of java)
3. (lab) development environment (using mingw)
4. (lab) refresh basic programming
5. modular/procedural programming vs object-oriented programming
6. from c to c++
7. basic overview of c++
8. keyword(s): structs, classes
9. basic phonebook application
10. compare modular/procedural vs object-oriented
11. encapsulation
12. keyword(s): private, protected, public
13. member functions
14. constructor, destructor (actually part of dynamic dispatch?)
15. dynamic dispatch
16. intro to inheritance
17. lab assessment 1
18. access for inherited properties/methods
19. more inheritance... multiple?
20. keyword(s): virtual

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