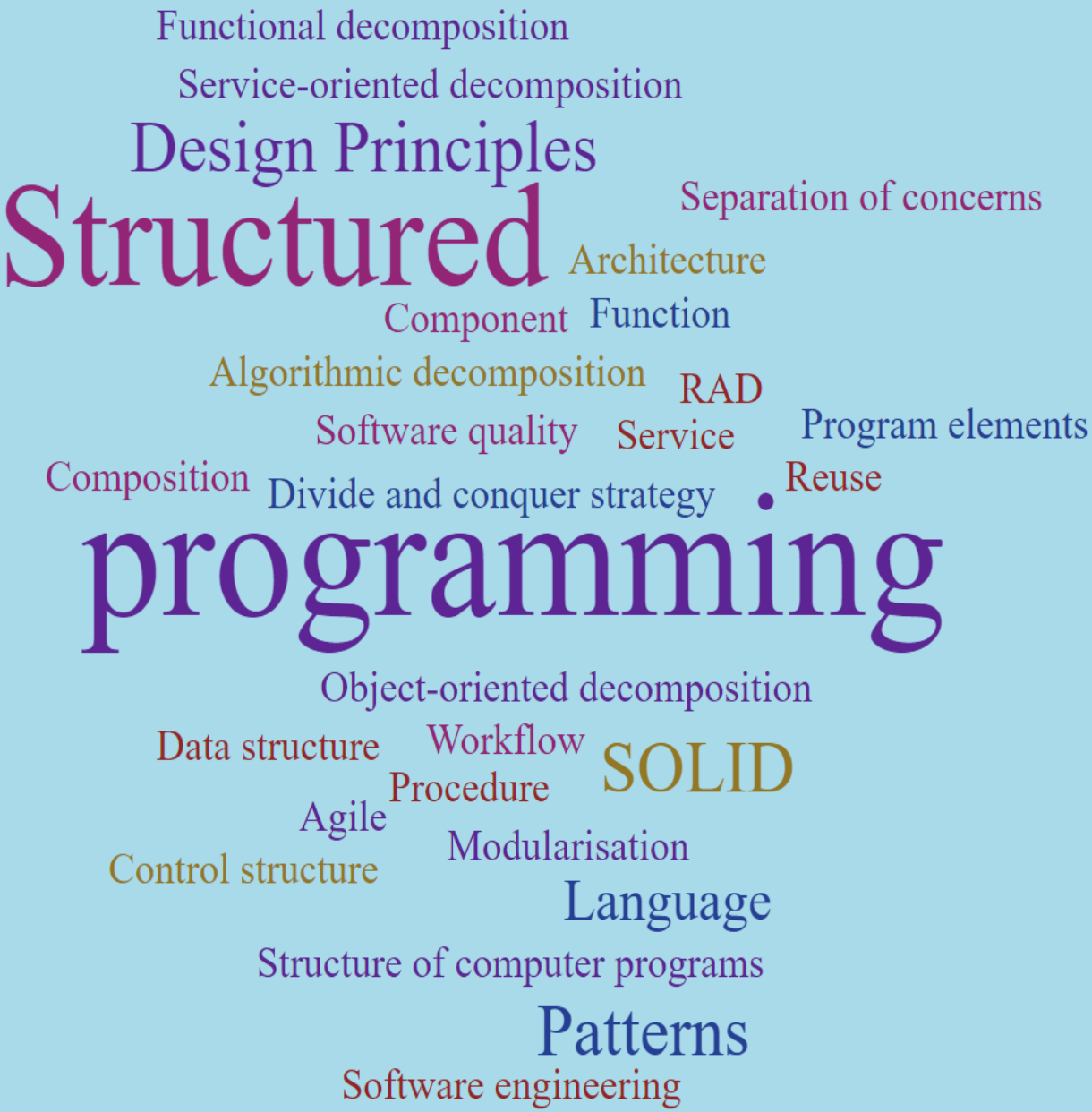
Functional decomposition
Service-oriented decomposition
Design Principles
Structured
Separation of concerns
Architecture
Component
Function
Algorithmic decomposition
RAD
Software quality
Service
Program elements
Composition
Divide and conquer strategy
Reuse
programming
Object-oriented decomposition
Data structure
Workflow
SOLID
Procedure
Agile
Modularisation
Control structure
Language
Structure of computer programs
Patterns
Software engineering

IT4492/IT4492E
Structured Programming

Lecturer:	**VU Thi Huong Giang**
Office:	R.601 B1 building 1A Dai Co Viet street 10000 Hanoi
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Email:	giangvth@soict.hust.edu.vn vthgiang@gmail.com
Web site:	http://www.soict.hust.edu.vn/~giangvh
Reception hours:	only by prior arrangement

Information

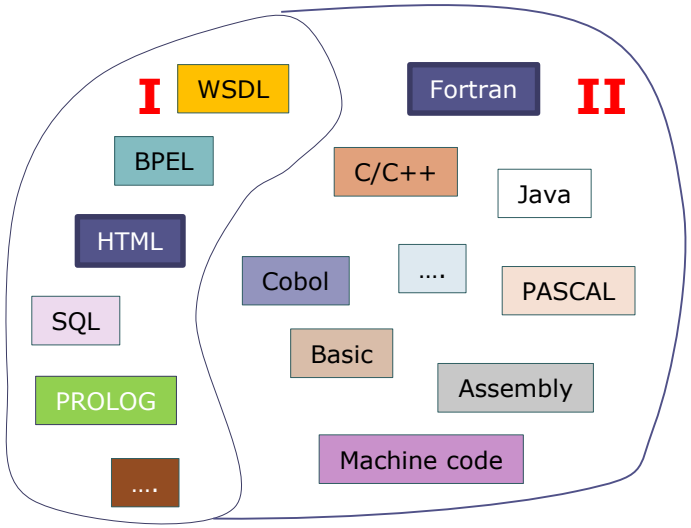
- Class: ICT – K59
  - Location: R.406, D9 building
  - Schedule: Thu. 14h15 - 15h50
    (45 minutes x 2 x 15 weeks)
- Class: AS – K59
  - Location: R.406, D9 building
  - Schedule: Wed. 16h00 – 17h35
    45 minutes x 2 x 15 weeks

Introduction

- Given a problem, how to:
  - Design an algorithm for solving it
  - Implement this algorithm as a computer program

→ Needs of programming languages and paradigms

- Language: express the algorithm to a machine
  - Declarative language (**I**): what to do, what to store
  - Non declarative language (**II**): how to do, how to store

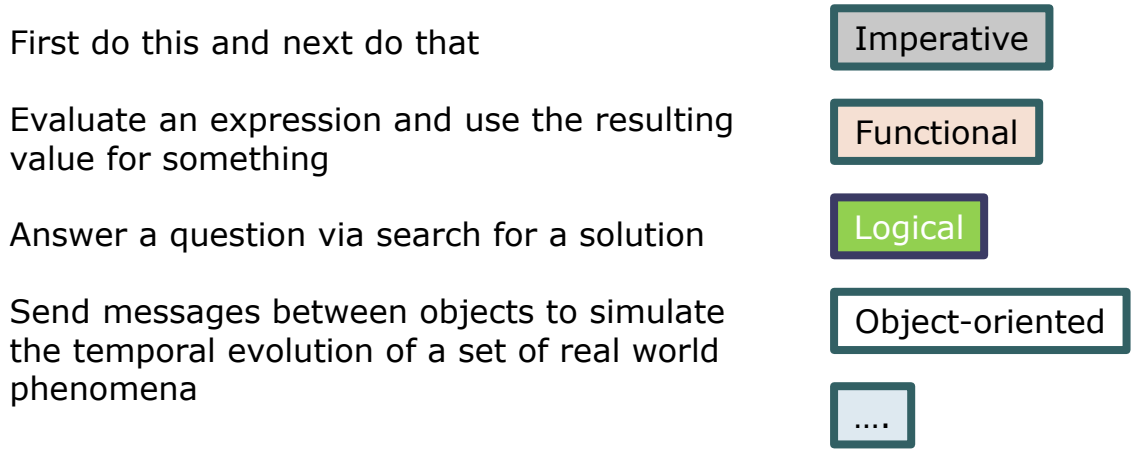


Introduction

- Given a problem, how to:
  - Design an algorithm for solving it
  - Implement this algorithm as a computer program

→ Needs of programming languages and paradigms

- Paradigm: comprise a set of concepts that are used as patterns for programming



Introduction

- Given a problem, how to:
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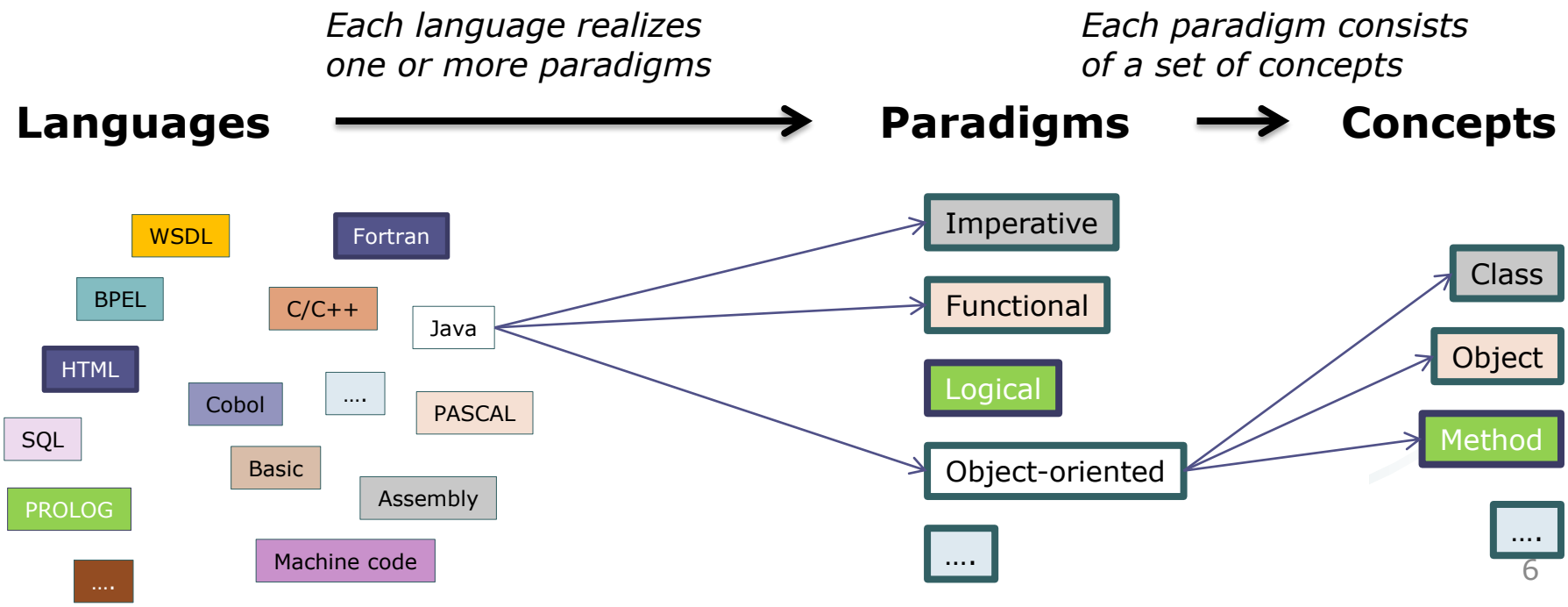
→ Needs of programming languages and paradigms



Introduction

How do you organize your code ???

- From **bad programming habits** …
  - Foggy idea about what is to be done
  - Write program with no planning: start from the beginning and write to the end
  - No systematic debugging: considered it finished if it works on only one test case

- … to **undesirable results**
  - Do not know how to program
  - Any change of requirement invites rewriting of the entire program again
  - Program with numerous bugs that take extremely long time to debug, or even failure to complete

Introduction

How do you organize your code ???

- Structured programming
  - Becomes popular since the 70's
  - Should have been learnt by students that have taken any programming course
  - Absolutely essential for handling software projects

Course Description

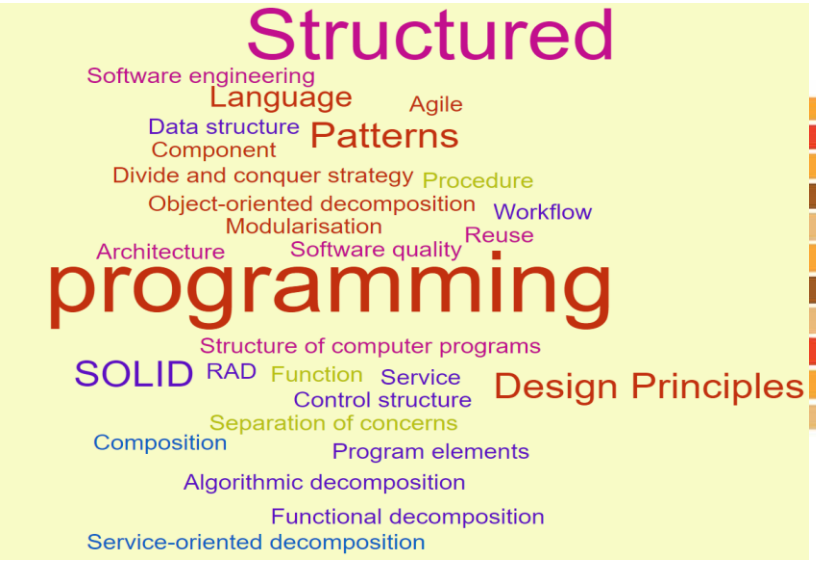
- Structured programming in software projects
- Principles and patterns central to successful software development
- Modern development methods
  - **rapid software development**
  - **software reuse**
  - software as a service
- Well-structured software practices

Objectives

Upon completion of this course, students will be able to:

- Knowledge:
  - Identify the needs for structured programming in software projects
  - Distinguish the program's low level structures that can be implemented by various programming languages
  - Summarize general design principles in software engineering and modern development methods
  - Determine good experiences as software patterns
- Skills:
  - Visualize the program structure in software design and development
  - Recognize, produce and maintain well-structured software
- Attitude:
  - Revise the program structure in software design and development
  - Show off a well-structured programming style

Schedule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1
2
3
...
1
2
3
...
Software
Software

Schedule

Week	Topic	Reading	Report / Assessment
	Software Engineering Revisited	SE1: Chapter 1 : pp.4-19 FSE: Chapter 1-3 : pp.1-66	
	Structured Programming in Software Project	SE2: Chapter 6: pp.254-277	
	Software Design and Architecture	FSE: Chapter 4: pp.67-160 FSE: Chapter 4: pp.146-152 SE1: Chapter 11: pp.241-265	
	Student Presentation		**X**
	Rapid Software Development	SE1: Chapter 17 : pp.391-414	
	Design Principle	ASD: Chapter 10-12: pp.111-145	
	Student Workings		**X**

Schedule

Week	Topic	Reading	Report / Assessment
	Software as a Service /Web service	SE1: Chapter 31: pp. 743-769	X
	Software patterns	ASD: Chapter 13-14: pp.151-172, Chapter 16-17, pp.177-192, Chapter 23-26: pp.293-354, Chapter 28-29: pp.387-441	X
	Student working		**X**
	Wrap up and Advanced topics		
	Student's final presentation		**x**

Method of Evaluation

- Mid-term evaluation (30%):
  - Attendance
  - Continuous assessment:
    - Assigned readings
    - Homework
    - In-class case study
    - Q&A
    - …
  - Project:
    - implement + test + enhance
    - demonstration + report + defense + review
- Final exam (70%):
  - Writing exam

The instructor reserves the right to modify course policies, course calendar, course content, assignment values and due dates, as circumstances require.

How to learn ?

- Self-studying at home
  - Do your homework (no late assignments will be accepted)
  - Read the lecture notes and answer the directive questions (if any) before attending class
  - Use Moodle:

  http://moodle.hust.edu.vn/course/view.php?id=37

- Active learning in class
  - Summarize the lecture content
  - Give answers for assignments