Object Oriented Software Engineering

Introduction

Presented By:

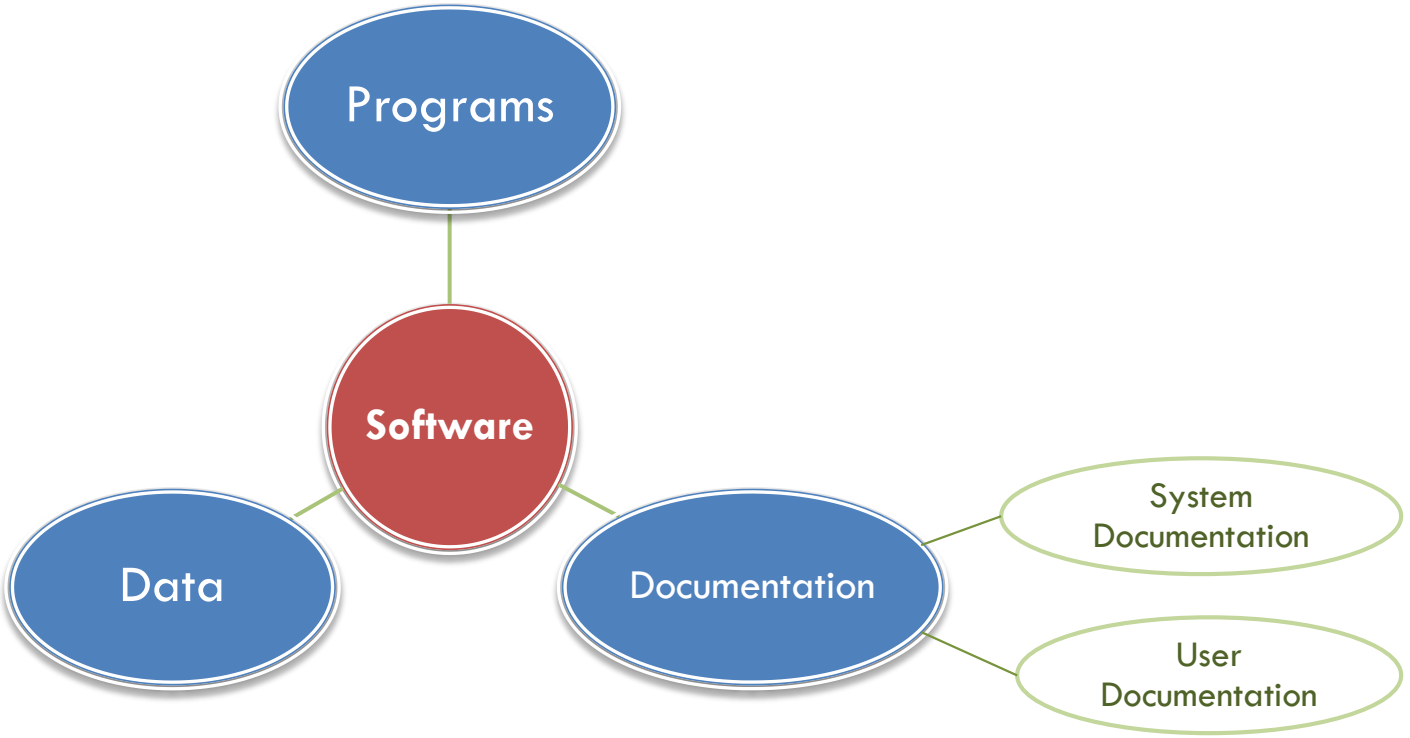
T.A. **Asmaa Hamad El-saied**

E-mail: **eng.asmaa134@gmail.com**

Rules

- Course Announcements, Discussions and Deliverables
  - Course documents sending.
    - Eng.asmaa134@gmail.com
  - Rule for Projects:
    - From my sections about 5 : 7 students.
    - Projects from the mentioned site or from your brainstorm.
    - Priorities, i.e., for all projects, register first.
  - Rules for sending
    - The team leader is responsible for sending.
    - The file name must be in this format leadername#assignumber.docx.
  - Rules for Discussions:
    - Will be after 2 sessions.
    - Groups will be distributed over my section times.
    - All members must attend in same time.
    - Delayed group will loss degrees for all members.

What is Software?



- Software products may be developed for a particular customer or may be developed for a general market

Software Development Crises

- **Software crisis** refer to the difficulty of writing useful and efficient computer programs in the required time.
  - **Symptoms**
    - Projects running over-budget.
    - Projects running over-time.
    - Software was of low quality.
    - Projects were unmanageable and code difficult to maintain.
    - Unreliable products that are full of bugs

Software Development Crises

- **Factors contributing to the software crisis**
  - Increasing complexity (large problem size, time)
  - Lack of professionals in SWE
  - Lack of progress in SWE discipline itself
  - Low productivity improvements

Therefore…

A well-disciplined approach to software development and management is necessary. This is called engineering.

Software Engineering

- The term *software engineering* first appeared in the **1968** NATO Software Engineering Conference at Garmisch, Germany and was meant to provoke thought regarding what was then called the **“software crisis”..**

- “.. An engineering discipline that is concerned **with all aspects of software production** from the **early stages** of system specification to **maintaining the system after it has gone into use**.”

Role of Software Engineering

- **A bridge from customer needs to programming implementation**

First law of software engineering

Software engineer is willing to learn the problem domain (problem cannot be solved without understanding it first)

Exploratory vs. Modern SWD process

- **Modern software development style** use of Life Cycle Models, i.e. Software is developed through several well-defined stages:
  - requirements analysis and specification, design, coding, testing, etc.
- **In the exploratory style**, coding was considered synonymous with software development.
- **In the modern software development style**, coding is regarded as only a small part of the overall software development activities. There are several development activities such as design and testing which typically require much more effort than coding.

Exploratory vs. Modern SWD process

- **In exploratory style,**
  - errors are detected only during testing,
- **Now,**
  - focus is on detecting as many errors as possible in each phase of development.
- An important difference is that the exploratory software development style is based on **error correction** while the software engineering principles are primarily based on **error prevention.**

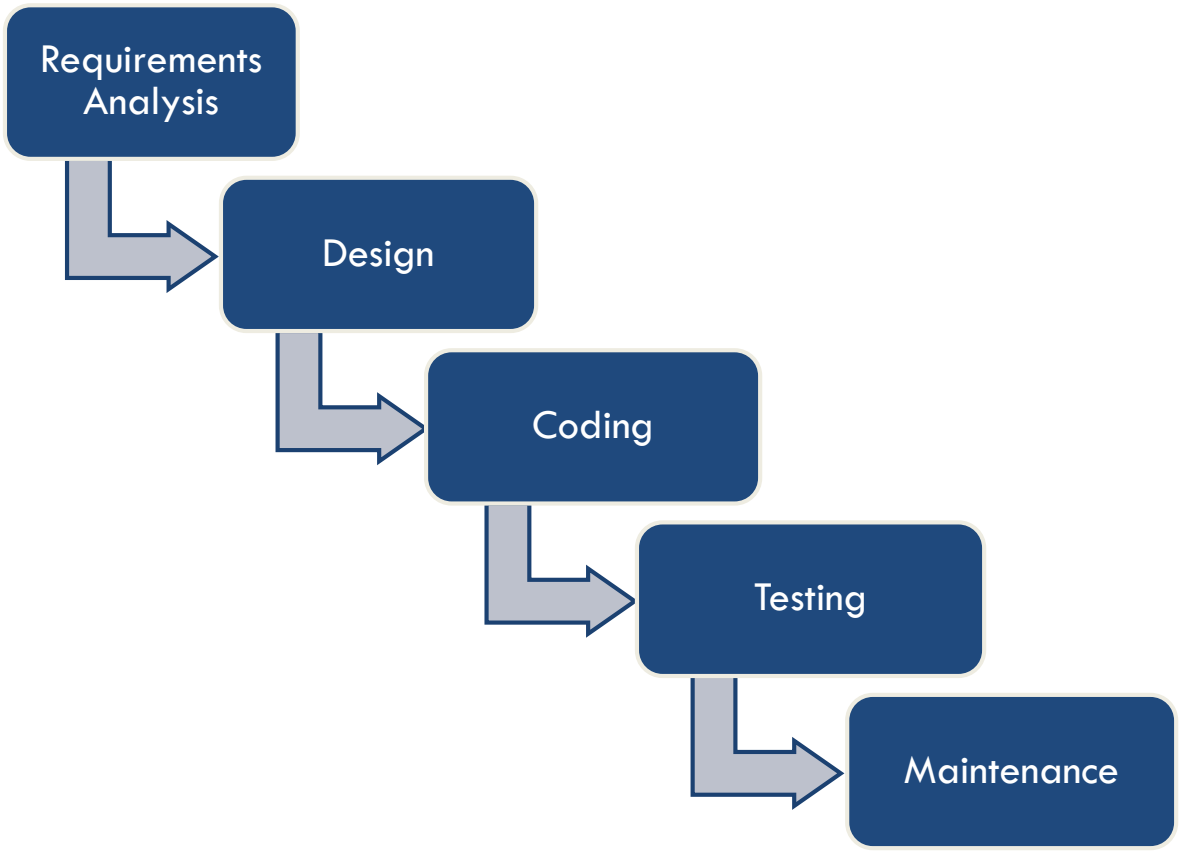
What is a Software Process?

- A set of activities that produce a software product:

SW Process Activity	What is going on there?
Specification	What does the customer need? What are the constraints?
Development	Design & programming.
Validation	Checking whether it meets requirements.
Evolution	Modifications (e.g. customer/market).

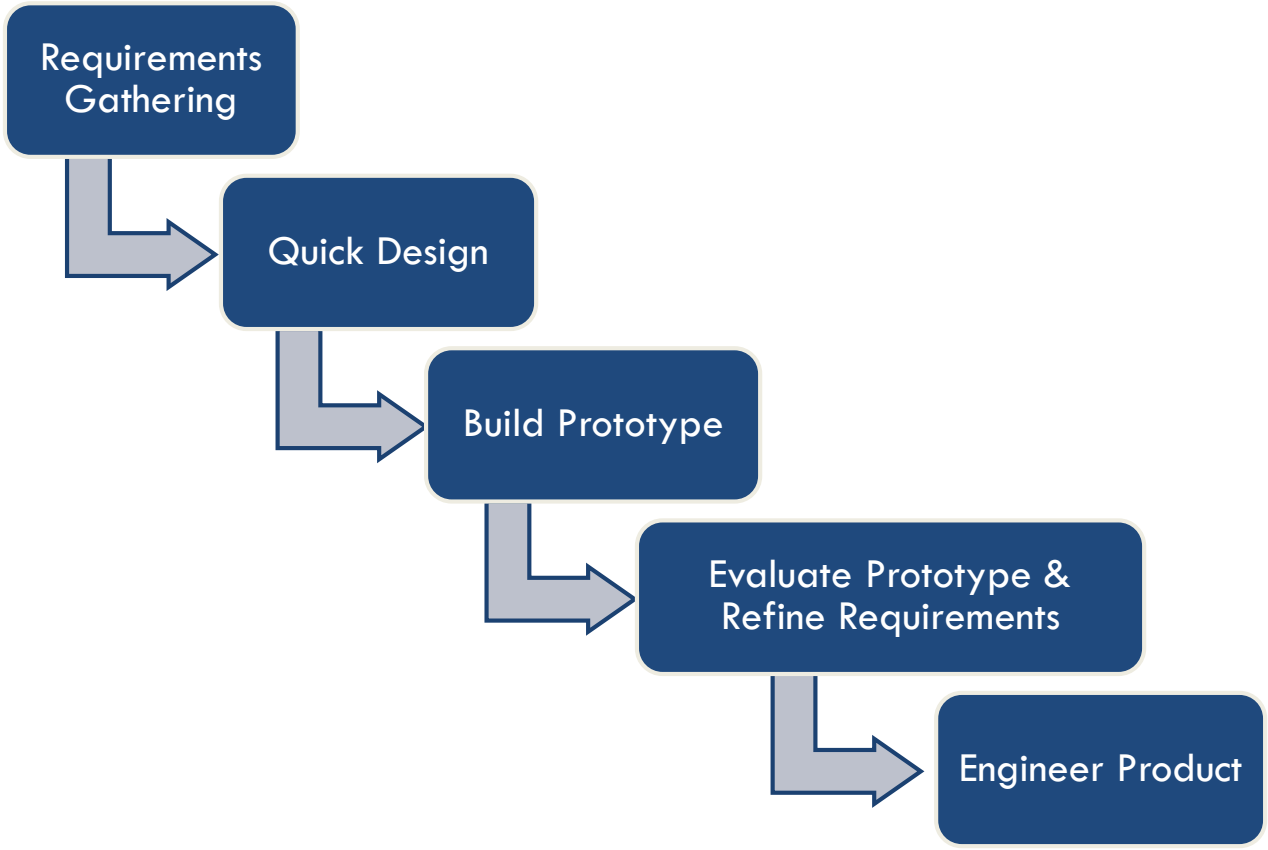
Software Process Models

- Classic life cycle model (waterfall model)(linear Sequential Model)



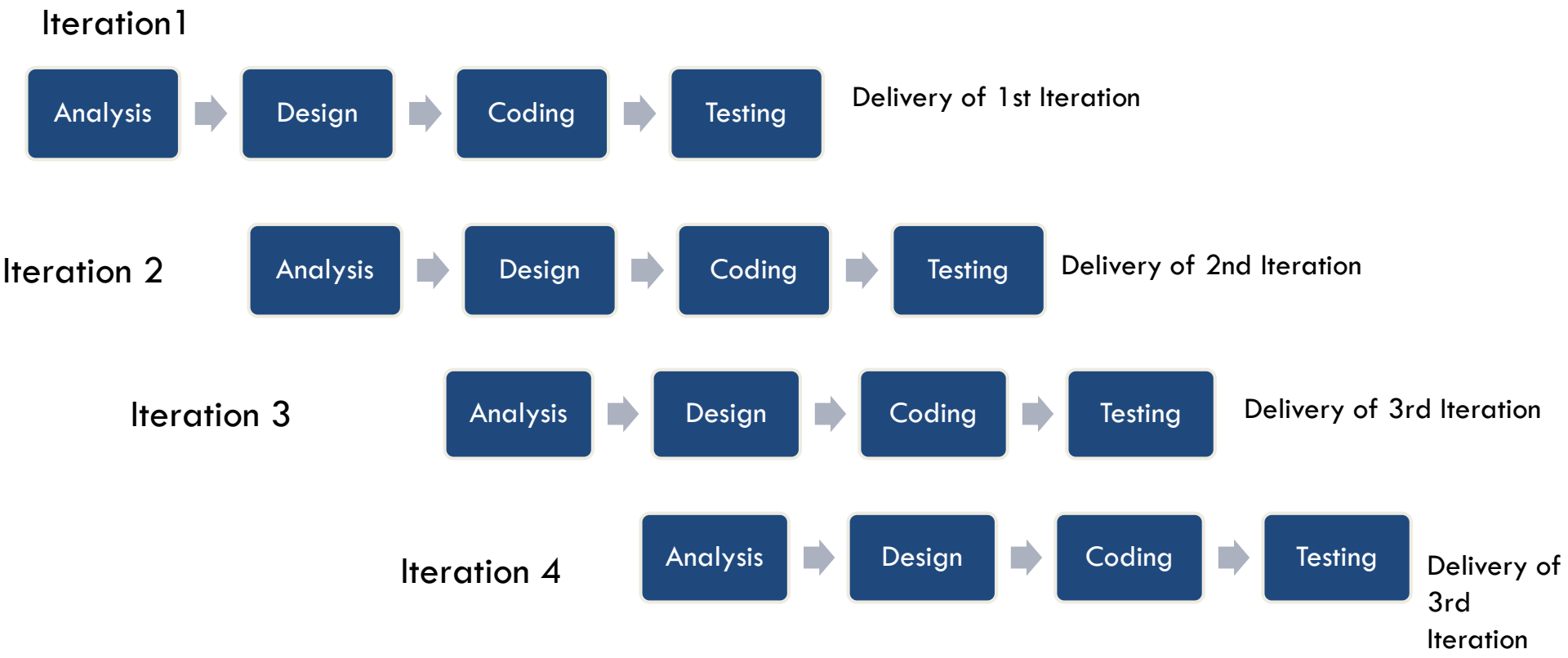
Software Process Models

- Prototyping model



Software Process Models

- Unified Process Model (Iterative life cycle)



SWE Models

- **Unified Process Model**
  - For example, **word-processing software** developed using the incremental model might deliver basic file management, editing, and document production functions in the first increment; more sophisticated editing and document production capabilities in the second increment; spelling and grammar checking in the third increment; and advanced page layout capability in the fourth increment

Tools & Documents

- Modeling Language Tool: to practice the software development life cycle
  - Edraw Max
  - Violet Editor
  - Any UML Editor
- Software Requirement Specification (SRS) Document: to write software documentation and explanation

Assignment #1

- Software Engineering Project
  - Form groups of 5:7 students (with one of them as a leader)
    - First page in template.
  - Brainstorm a suitable project idea
    - You can use suggested project list in mentioned site: https://sites.google.com/view/dr-hamada-ibrhim/courses/project-ideas
    - Present this to the class “simple discussion”

Thanks