**Software Engineering**

**1/12/2022**

Program: Set of instructions for a pc

Software: Program + Documentation

Software Engineering: A set of steps taken to build a software

System Software (OS), Application Software

SDLC: Software Development Life Cycle

1. Requirement\Specification (Customer + Develop)

Defines what the program needs to do; Functional requirement and nonfunctional requirement

1. Analysis
2. Design
3. Implementation + Verification
4. Testing + Validation (Checking that all requirements are implemented)
5. Deployment\Release
6. Maintenance

Stub: Line of code showing something is not implemented yet but allows program to run

**1/19/2022**

Definition: User requirements represent statements of what the system should provide and what are the constraints the system shall operate under

System Requirements: More detailed description of the system services and constraints written by the system developers

Main goal of requirement documents is to Validate the developed system

Functional requirements define what the system should do

Nonfunctional requirements specify system properties; place constraints on the system or development process

Elicitation is the practice of obtaining the requirements of a system from users

* Stakeholders don’t know what they want
* Stakeholders use their own language that engineers might not understand
* Stakeholder requirements may conflict
* Political or other factors can effect requirements

Checks that should be applied during validation: Consistency, Completeness, Realism

**1/24/2022**

A good software should deliver required functionalities and performance to the user and should be: maintainable, dependable, securable, and usable

Cost of building and good software

60% of costs are software development costs

40% Software Testing costs

Maintainability: the software should be able to evolve to meet new requirements from the client

Dependibility: Reliability and safety; Shout not cause physical or economic damage in the event of failure

Efficiency: Should not make wasteful use of resources

For Flowcharts:

* Circle: Start of Program \ Stop of PRogram
* Rectangle/square: Statement
* Diamond: Condition

**1/31/2022**

Successful Project

User input

Clean requirements

Propere planning

Failed Project

Lack of user input

Incomplete requirements

Changing requirements

Software Product Failure

Code Error 33 - 38%

Design Error 17 - 24%

Document Error 13 - 33%

Requirement Error 12 - 50%

Bad-fix error 11 – 67%

Process: A program in execution \ Loaded in Memory

AGILE

CRUM

**2/7/2022**

Process Model:

* what tasks need to be performed
* In What sequence
* In what condition
* And by Whom

Provides guidance for coordination and controlling of tasks and personnel

Code 🡪 Compile 🡪 Test 🡪 Debug 🡪 Release

Types of Models: Waterfall,

Waterfall: Requirements must be specified; Tasks are completed in sequence

Incremental: Every major Requirement developed and tested separately; all combined at end

Agile methodologies:

1. Short releases and multiple iterations
2. Incremental design
3. User involvement
4. Minimal documentation
5. Informal communication
6. Assumes changes

Extreme Programming (XP)  
Crystal Clear/Orange

Scrum

RUP (rational unified processes)

Microsoft Solutions Framework

Requirement Document:

Customer: Determines Requirements

Business Analyst: Discovers problems and requirements and comes up with solution

Project Manager: Responsible for delivering the solution to a problem

System Analyst: uses analysis and design to satisfy requirements using IT

Marketing Manager: develop marketing strategy

Product manager: defining the why, when, what of the product

9 Types of requirement documents:

1. BRD: Business Requirement Document
2. FRD: Functional R D
3. MRD: Market R D
4. PRD: Product R D
5. UIRD: User Interface R D
6. TRD: Technical R D
7. QRD: Quality R D
8. SRS: Software Requirement Doc & Software Requirement Specifications
9. CRD: Customer R D

**12/14/2022**

Two levels of design

* Architectural (High Level)
* Detailed Design