LECTURE 1

Introductory Lecture

Dronacharya College of Engineering

PRINCIPLES OF SOFTWARE ENGINEERING

This Subject is divided into 4 sections

Section1:

Introduction about SE and Software project Management

Section2:

Requirements Analysis and specification and System Design

Section3:

System Design and Testing and Maintenance

Section4:

Software Reliability and Quality Assurance

Learning Outcomes of this subject :

The course will aim to give a good understanding of basic design methods, and emphasize the need to produce well-structured maintainable computer software. The course will concentrate on principles, by the end of the course students should:

- ✓ understand concepts of basic program design techniques that can be applied to a variety of programming languages.
- ✓ understand the need for structured programming in software projects
- ✓ be able to recognise and to produce and/or maintain well structured programs
- ✓ have a basic understanding of the role of and advantages of object oriented design

Topic Covered in this lecture:

1. What is Software
2. What is difference between Software Engineering and Computer Science
3. What is Software Engineering
4. What is Software Products
5. What is Software Process
7. Basic Activities of Software Engineering
8. Efforts Breakdown of Projects

INTRODUCTION:

Software Engineering is the sub discipline of Computer Science that attempts to apply engineering principles to the creation, operation, modification and maintenance of the software components of various systems.

As with much of Computer Science, the subject of Software Engineering is at a very early stage in its development. It is much more of an art than a science.

What is Software

Computer programs and associated documentation

or

Software is

1: An instruction (computer program) or set of instruction that when executed provide desired functionality and performance.

2: A data structure that enable the program to manipulate the information

3: Document that describe the operation and use of program.

What is Engineering

- Any systematic (step by step) approach is known as engineering

OR

- Acting according to a plan

WHAT IS SOFTWARE ENGINEERING?

Software Engineering is the systematic approach to the development, operation, maintenance and retirement of software. This is the definition as per IEEE.

or

Software engineering is an **engineering** discipline which is concerned with all aspects of software production

or

Simple Definition: Designing, building and maintaining large software systems

What is the difference between software engineering and computer science?

Computer Science	Software Engineering
is concerned with	
➢ theory ➢ fundamentals Algorithms, date structures, complexity theory, numerical methods	➢ the practicalities of developing ➢ delivering useful software SE deals with practical problems in complex software products

Computer science theories are currently insufficient to act as a complete underpinning for software engineering, BUT it is a foundation for practical aspects of software engineering

What is Software Product ?

The software product is “built” or “developed” by software engineers. The product is built by applying a process that leads to a high-quality result that meets the needs of people who will use the product.

From the viewpoint of a software engineer, the product is the programs, documents and data that are computer software.

From a user’s viewpoint, the product is the resultant information that somehow makes the user’s world better.

What is Software Product ?

Software product may be developed for a particular customer or may be developed for a general market . Software product may be

Generic- developed to be sold ta range of different customers. For example MS Office, Games etc

Custom- developed for a single customer according to their specification.

What is Software Process ?

A frame work for the task that are required to build a high quality software.

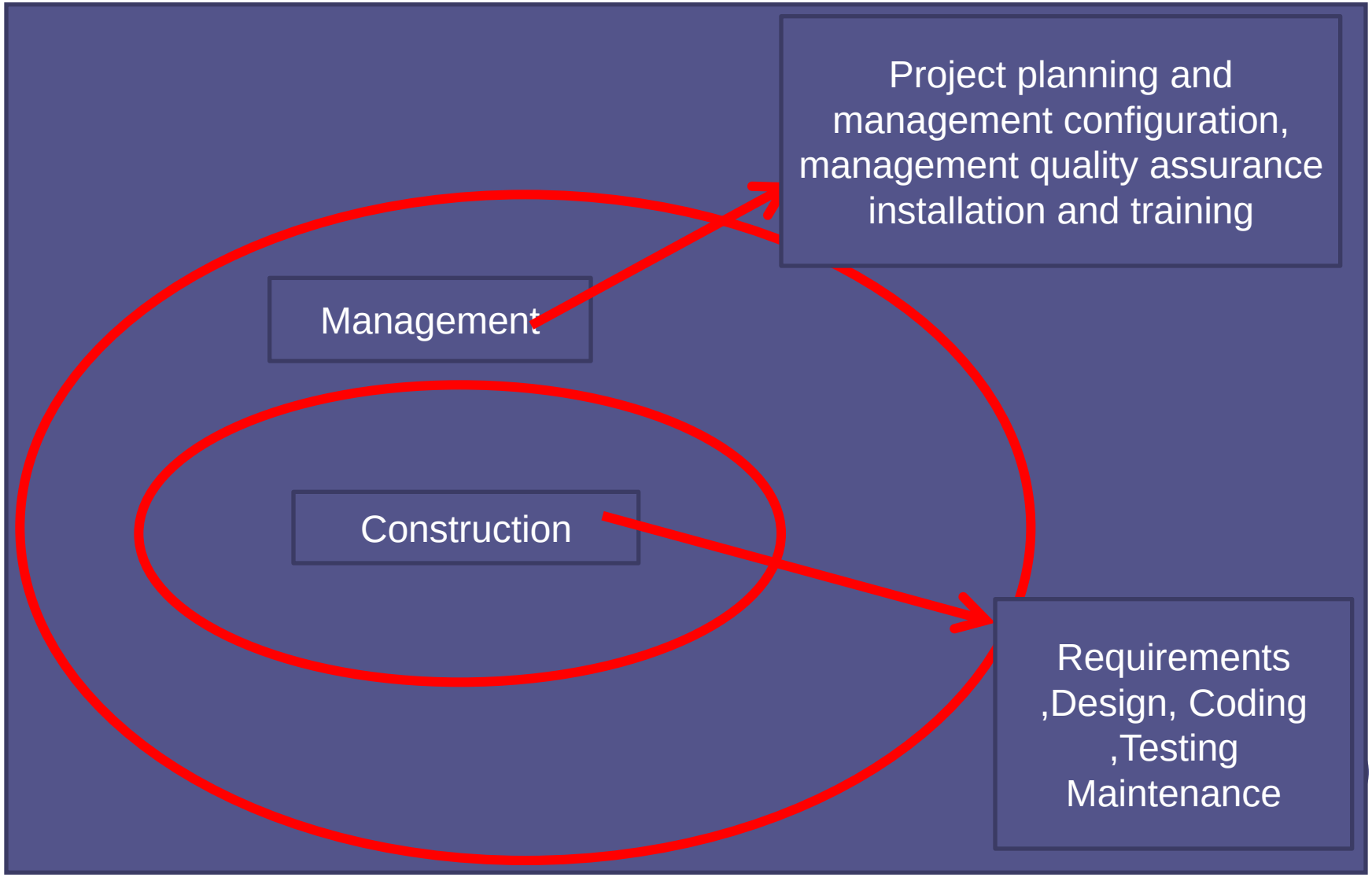
or

A roadmap that help to create a timely high quality software

What is a software process?

- Generic activities in all software processes are:
  - Specification - what the system should do and its development constraints
  - Development - production of the software system
  - Validation - checking that the software is what the customer wants
  - Evolution - changing the software in response to changing demands

What is a **software** Development?



What are basic Activities of Software Engineering ?

- Define the software development process to be used
- Managing the development project
- Describing the intended software product
- Designing the product
- Implementing the product
- Testing the the parts of the product
- Integration the parts and testing them as a whole
- Maintaining the product.

Effort Breakdown of Software (Project)

- Project - 8.08%
- Requirements - 14.43%
- Design - 11.36%
- Coding - 13.50 %
- SQA - 30.64%
- SCM - 13.02%
- Integration - 6.54%
- Misc - 3%

What are the attributes of good software?

The software should deliver the required functionality and performance to the user and should be maintainable, dependable and usable

- Maintainability
  - Software must evolve to meet changing needs
- Dependability
  - Software must be trustworthy
- Efficiency
  - Software should not make wasteful use of system resources
- Usability
  - Software must be usable by the users for which it was designed

ASSIGNMENT

Question1-

Define the term "Software Engineering". Explain the major differences between software engineering and other traditional engineering disciplines.

Question 2-

What is software engineering? Is it an art, craft or a science? Discuss.