Introduction

CSE 3223

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Course Introduction

- Course No: **CSE 3223**
- Course Title: **Information System Design and Software Engineering**
- Credit: **3.00**
- Assessment Criteria:
  - Attendance 10% [*Class Performance]
  - Class Test 20% [3 (three) Quizzes and 1 (one) Assignment]
  - Final Exam 70%

Total	**100%**

Course Objectives

- To help students to **develop skills** that will enable them to construct **software of high quality**.
- Software that is **reliable**, and that is reasonably easy to understand, modify and maintain.

Book(s)

Software Engineering (9th Edition)
Author: **Ian Sommerville**
Published by Addison Wesley, 2010

Software Engineering: A Practitioner's Approach (7th Edition)
Author: **Roger S. Pressman**
Published by McGraw-Hill College

Systems Analysis and Design (8th Edition)
Author: **Kenneth Kendall**
Published by Pearson Education Limited

What is Software?

We can define it as:

- Instructions (Computer Programs) that when executed provide
  - Desired features
  - Functions and
  - Performance.
- The data on which the program operates is also considered as a part of the software.
- Documents that describe the use of the Programs.

Role of Software

- A person might be involved with software more than 100 times, often without even realizing that.
- We might use a computer :-
  - To check email or weather
  - To play games
  - To watch movies
- Traffic signals are now computer controlled
- Our bank system is highly computerized
- Hotel arrangements will be handled by computers and software
- Air plane & Air traffic control is highly computerized
- Medical Instruments and diagnostic procedures are now computerized

Attributes of Good Software

- Should deliver the required functionality and performance to the user.
- Reliability
- Good user-interface
- Should be maintainable and reusable

Categories of Computer Software

- System Software
- Application Software
- Engineering/Scientific Software
- Embedded Software
- Web Applications
- Computer Programming tools
- Artificial Intelligence Software

Software Products

- **Generic products**
  - Stand-alone systems that are marketed and sold to **any customer** who wishes to buy them.
  - **Examples** – PC software such as editing, graphics programs, project management tools, databases and drawing packages.
- **Customized products**
  - Software that is commissioned by **a specific customer** to meet their own needs.
  - **Examples**–systems written to support a particular business process.
- More and more systems are being built with a generic product as a base, which is then adapted to suit the requirements of a customer.

Software Crises

- In the early 60s, software suffered from a problem, which we call the ***Software Crisis***.
- The techniques that were used to develop small software were **not applicable** for large software systems.
- In most of the cases the software that was built using the **old tools and techniques** was **not complete**.
- Most of the time it was **delivered too late**.
- Most of the projects were **over-budgeted**.
- And, in most of the cases, systems built using these techniques were **not reliable**.

Software Crises (contd..)

- **A conference was held in 1960 in which the term “software crisis” was introduced**
- Software engineering is the result of the software crisis when people realized that it was not possible to construct complex software using the techniques applicable in 1960s.
- An important result of this was that people realized that just coding was not enough; we also need to apply engineering principles.

What is Software Engineering?

- All aspects of software production "**Software Engineering**" is not just concerned with the **technical processes** of software development but also with activities such as **software project management** and with the development of tools, methods and theories to support software production.

- Computer Science vs. Software Engineering
  - Computer science focuses on theory and fundamentals; software engineering is concerned with the practicalities of developing and delivering useful software.
- System engineering vs. Software Engineering
  - System engineering is concerned with all aspects of computer-based systems development including hardware, software and process engineering. Software engineering is part of this.

Software Costs

- Software costs often dominate computer system costs. The costs of software on a PC are often greater than the hardware cost.
- Software costs **more to maintain** than it does to develop. For systems with a long life, maintenance costs may be several times development costs.
- Software engineering is concerned with cost-effective software development.
- Roughly **60%** of costs are development costs, **40%** are testing costs.
- Costs vary depending on the type of system being developed and the requirements of system

Software Engineering Ethics

- “Software engineers are those who contribute by direct participation or by teaching, to the analysis, specification, design, development, certification, maintenance, and testing of software systems.”
  - Confidentiality
  - Competence
  - Intellectual property rights
  - Computer misuse
- Software engineers shall act consistently with the public interest.

END