

# SE2030 – Software Engineering

Department of Information Technology, Faculty of Computing

## Year 2 semester 1 (2025)

### Tutorial 01

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#### Scenario 1 : SafeTrack – A Health App for Rural Schools

You're part of a team developing SafeTrack, a mobile app to monitor children's health metrics (e.g., BMI, activity levels, and diet) in remote schools. The government wants the app ready in 3 months for pilot testing in 50 schools. You are responsible for the early-stage software planning and ethical decision-making.

#### Questions

1. Based on this scenario, define what software engineering means in contrast to just 'coding'.
2. Why is a structured development process important for this app?
3. Evaluate the above project's feasibility in the following five areas. For each, identify one risk or concern and suggest a mitigation strategy:
  - (a) Technical
  - (b) Economic
  - (c) Legal
  - (d) Operational
  - (e) Schedule
4. List and briefly describe the SDLC phases your team should follow for SafeTrack. Add a short note on what tasks would happen in each phase for this app.
5. You discover a major bug in the data reporting module that could result in incorrect health warnings. Your manager asks you to release the app anyway to meet the pilot deadline.
  - (a) What are your ethical responsibilities as a software engineer?
  - (b) Which ACM/IEEE principles would you follow?
  - (c) What steps would you take in response?

## Scenario 2: Therac-25 Scenario: The Radiation Therapy Machine

In the early 1980s, a hospital began using a new computerized radiation therapy machine for cancer treatment. The system, which had replaced older machines, was much faster and controlled entirely by software.

On a quiet Tuesday, a patient named Emily was brought in for her regular treatment session. The machine operator, Tom, selected the correct settings and started the procedure. But within seconds, Emily screamed in pain and was rushed out of the room.

An investigation found that Emily had received over 100 times the intended dose of radiation. Over the next two years, five more incidents occurred in different hospitals using the same machine.

Engineers discovered that the software controlling the radiation beam could enter a dangerous state due to a timing bug. There were no safety checks in hardware, and previous reports of similar issues had not been taken seriously by the manufacturer.

### Questions

1. What went wrong in this software system?
2. What software engineering practices were missing?
3. What ethical responsibilities were violated?