Class Exercise:

System Modeling:

1. Develop a sequence diagram showing the interactions involved when a student registers for a course in a university. Courses may have limited enrolment, so the registration process must include checks that places are available. Assume that the student accesses an electronic course catalog to find out about available courses. (request message, reply message, alternative frame)

2. Look carefully at how messages and mailboxes are represented in the email system that you use. Model the object classes that might be used in the system implementation to represent a mailbox and an e-mail message.(attributes, methods)

3. Using your knowledge of how an ATM is used, develop a set of use cases that could serve as a basis for understanding the requirements for an ATM system. (relationships: include, extend, generalization)

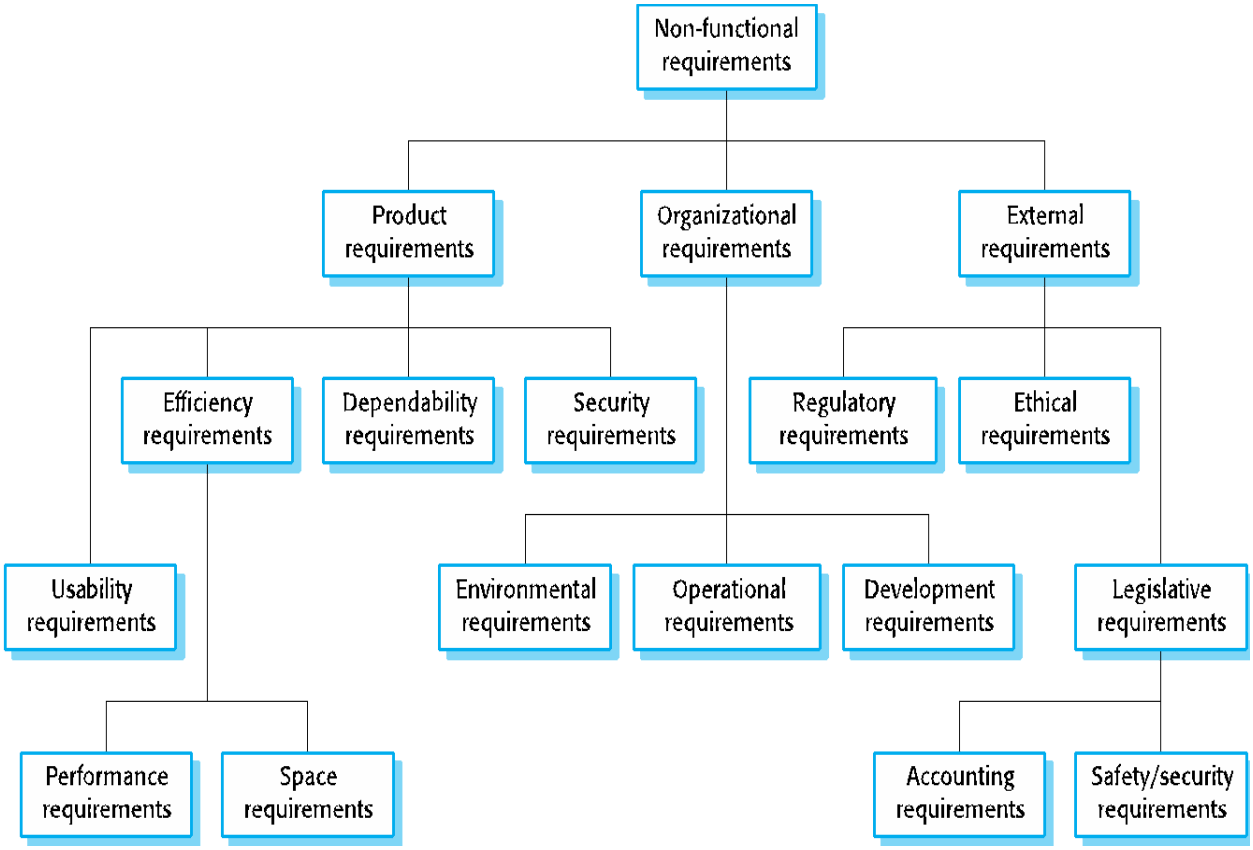
Requirement:

4. Discover ambiguities or omissions in the following statement of requirements for part of a ticket-issuing system:

   An automated ticket machine sells rail tickets. Users select their destination and input a credit card and a personal identification number. The rail ticket is issued and their credit card account charged.

   When the user presses the start button, a menu display of potential destinations is activated, along with a message to the user to select a destination and the type of ticket required. Once a destination has been selected, the ticket price is displayed and customers are asked to input their credit card. Its validity is checked and the user is then asked to input their personal identifier (PIN). When the credit transaction has been validated, the ticket is issued.

5. Write a set of non-functional requirements for the ticket-issuing system, setting out its expected reliability and response time.(Usually a ticket-issuing system more active working time is from 06:00 - 23:00)



6. Suggest why it is important to make a distinction between developing the user requirements and developing system requirements in the requirements engineering process.

Agile Development:

7. Explain how the principles underlying agile methods lead to the accelerated development and deployment of software.

Software Processes:

8. Giving reasons for your answer based on the type of system being developed, suggest the most appropriate generic software process model that might be used as a basis for managing the development of the following systems:
    a. A system to control anti-lock braking in a car
    b. A virtual reality system to support software maintenance
    c. A university accounting system that replaces an existing system
    d. An interactive travel planning system that helps users plan journeys with the lowest environmental impact

(three process models:

Waterfall model, incremental development, integrate and configuration)