Software Methodologies Course
Part 1: Systems Engineering

Homework

1) Select with any large system or product with which you are familiar.
   - i. Apply partitioning criteria you consider necessary to reduce the system complexity.
   - ii. Define the set of domains that describe the world view of the system or product.
   - iii. Describe the set of elements that make up one or two domains.
   - iv. For one element, identify the technical components that must be engineered and the engineering domain they need.

2) Give five examples of man-made systems that have lasted for more than 1000 years. For each case, give a brief description of why they have lasted and whether they can be expected to continue surviving over the next thousand years.

3) Give ten examples of systems that you deal with or interact with in your day-to-day life.

*Domains are the top level concerns we use to partition our system. For example for a company the domains can be the different divisions: Accounting, Marketing, Production etc. For a car the domains can be the different subsystems: Electrical, Hydraulics, Suspension etc. For the human body the domains can be the Respiratory system, Circulatory system etc. The elements are the components of a domain, for example the heart in the circulatory system. Each technical element is engineered in a certain domain. For example a software program in the Accounting Division needs software development skills.

4)
   a. Develop a system context diagram and system flow diagrams for one of the following systems:

   - a university registration system
   - an Internet access provider
   - an interactive hotel reservation system
   - a hospital
   - a telephone company billing system
   - a transportation company truck tracking system
   - a software company testing division
   - an air traffic control system

b. For the chosen system use the System Modeling template taking into consideration different partitions: according to the processing (information/material/energy) and/or the processor (auto/manual) views.

c. The system context diagram and system flow diagrams are presented in the lecture as the architecture context flow diagram. Choose one subsystem and represent it as an architecture context flow diagram, too.