

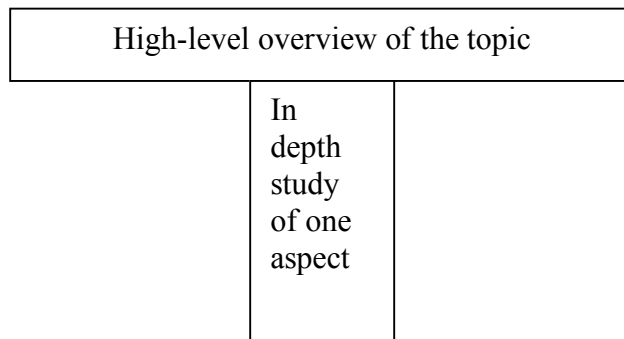
MSc Module: Systems Engineering 2004

Introduction

Most courses in this MSc focus on software and methods and techniques for designing and developing different types of software systems. However, software does not exist in isolation – it is always part of some encompassing system that includes both hardware (computers and other devices) and people. The success or otherwise of a system is not just dependent on good software engineering – it depends on ensuring that the system meets the real needs of the organisation (or individual) using that system and on designing the system so that the hardware, software and people can work effectively together to meet the system goals. This course, therefore, stands back from the software and looks at the issues concerned in the design of these broader systems.

The term that is now widely used to describe these broader systems is socio-technical systems. This indicates that the operation of the system does not just depend on deterministic hardware and software systems, but also on (non-deterministic) human, social and organisational factors. As we shall see, the complexity of the interactions between people and technical systems is one of the things that makes systems engineering particularly difficult.

Socio-technical systems engineering is a huge topic which could be an MSc in its own right. In a week, it is only possible to touch on the range of sub-topics that make up systems engineering. However, I think it is inherently unsatisfactory for everything to be presented at a high-level of abstraction so I normally in my courses adopt what Alan Dix called a T-model of course presentation.



This avoids what I think is the unsatisfactory situation of not really having an in-depth understanding of anything in the subject. This year, the aspect of systems engineering that we will look at in depth is **requirements engineering for critical systems**. This will complement the more general material covered in the System Dependability option.

Material available

The course material that is available from the web site includes PDF versions of all lecture notes, self-assessments and coursework information. I have also included some links to other material on the web on systems engineering and to my own web site from which you can find lots of other software and systems engineering material.