Chapter 1 of the textbook provides an overview as to what an operating system is and the concepts that are involved therein. An operating system is defined as a software that manages the physical hardware of a computer, and provides an environment in which programs/applications can run. This chapter discusses interrupts - a key way for hardware to interact with the operating system, specifically by notifying the CPU of an event that has occurred. Memory was discussed – specifically how programs must be loaded into main (volatile) memory, in order to be able to execute a program. This is different from non-volatile memory, like a hard disk, wherein such contents are permanent. Memory is managed by keeping track of which memory portions are being used, and dynamically allocating free space where needed.

The chapter discussed modern computer architectures which include multiprocessor cores. Best utilization of the CPU involves allowing several jobs in memory concurrently. A CPU will commonly schedule algorithms to rapidly switch between processes to provide quick response times. Process management involves the creation and deletion of process as well as mechanisms for processes to communicate with each other. User mode and kernel mode was reviewed, where some instructions can only be executed in kernel mode, such as I/O control and interrupt management. An operating system will provide mechanisms for protection and security, including controlling the access of processes/users to the resources made available by a system. Virtualization is where a computer’s hardware is abstracted into different environments. Today, computing can take place in many ways, including via mobile computing, through client-server systems, and real-time embedded systems. Free and open-source systems are common, and allow the system to be used at no-cost, redistributed, and even modified. One popular example of a FOS system is Linux, which comes in many flavors.