4.1Extend the IEEE definition of software architecture to include a definition of the activities involved in architectural design.

*Architectural design includes in depth consideration of the following issues: non-functional product characteristics (such as security), product lifetime, software reuse, number of users, and software compatibility. Additionally, things like weighing maintainability vs performance, security vs usability, and availability vs time to market and cost.*

4.2. An architecture designed to support security may be based on either a centralized model, where all sensitive information is stored in one secure place, or a distributed model, where information is spread around and stored in many different places. Suggest one advantage and one disadvantage of each approach.

*One advantage of using a centralized model is that one can put all their resources into protecting information in one place. One disadvantage is that if someone does manage to get in, they have access to all the sensitive information. One advantage of a distributed model is that someone would have to gain access to a bunch of different places in order to get all of the sensitive information, which would likely prove to be a difficult task. One disadvantage is that security resources would have to be spread thinner, resulting in less security in each respective location.*

4.3 Why is it important to try to minimize complexity in a software system?

*Programs that are more complex are harder to understand, which will increase the likelihood of a software developer making mistakes, and makes future changes or updates harder to implement.*

4.4 You are developing a product to sell to finance companies. Giving reasons for your answer, consider the issues that affect architectural decision making (Figure 4.4 (2) and suggest which two factors are likely to be most important.

*I would say that non-functional product characteristics would be the most important in this case. Given that the clients are finance companies, they undoubtedly handle a lot of sensitive information. Making sure that security is as strong as possible will be a very large concern. I would say that number of users would be the second-most important factor. Given that the software product would contain a lot of sensitive information, it is important that it can handle an abundance of users. If a user attempts to access their information and then the system crashes, they likely will become very concerned, which could lose the finance company business.*

4.5 Briefly explain how structuring a software architecture as a stack of functional layers helps to minimize the overall complexity in a software product.

*In a stack of functional layers, lower levels do not depend on higher-level components. When organized in this way, it is simple and easy to see what elements interact with each other and the flow of logic.*

4.8 Under what circumstances would you push as much local processing as possible onto the client in a client-server architecture?

*When your server has limited resources or is not powerful enough to handle a large amount of processing, then it would be beneficial to have more client-side processing.*

4.9 Explain why it would not be appropriate to use a multi-tier client-server architecture for the iLearn system.

*The iLearn system has many vastly different functions, so it would make more sense to have a service-oriented architecture with a server for each function, instead of the centralized servers used in multi-tier. This also allows the iLearn system to be easily updated and to have new functions added to it.*