**CSCI 6340 Software Engineering**

**Dr. John P. Abraham, Professor**

**Semester Project. Spring 2020**

Dear Students:

I wish you a happy new year and a pleasant semester filled with new learning experiences. All of you have developed some software in the past. Much of it was directed by a faculty or a supervisor at your workplace. Most of the time you sit in front of a computer and start writing the software without planning out objects, modules, variable names, dataflow, etc., and you succeed or fail by trial and error. Some of the baby-programs I assigned last semester took days and days of trial and error for some of you. In this course we are going to learn systematic way of developing software to save time and money that yields reliable, robust software. Software engineering is concerned with theories, methods and tools for professional software development.

There are various kinds of software products. Most of us buy commercially available generic products such as Office Suite, Accounting Package, etc. We are going to design a customized product that is created for one large corporation to meet its specific needs. If the software goes down a corporation may lose hundreds of millions of dollars per day. Thus, the software we generate must be robust and well thought out. The specification of what the software should do is owned by the customer for the software and they make decisions on software changes that are required.

Many corporations follow the Scrum.org methodology of Agile software development. There are many tutorials on YouTube and elsewhere for you to follow. Our one semester does not allow us to explore this topic in class at length. Anyone seeking software project management related jobs should learn Agile techniques thoroughly. For this semester, we are going to be using the waterfall plan-driven model. This model uses Software specification, Software development, Software validation and Software evolution. It has separate and distinct phases of specification and development, requirements analysis and definition, system and software design, implementation and unit testing, integration and system testing, and operation and maintenance.

Please take extensive notes during each of the stages as you will submit a final report hundred pages or more. We will spend great deal of time on Software specification (defining what the system should do), where customers and engineers define the software that is to be produced and the constraints on its operation. Once we have a thorough understanding of what the customer wants (requirement specification), we will do a feasibility study (is it technically and financially feasible to build the system?). For this part of the software engineering, you will do extensive interviews with the customer (in this case your professor. Your professor will not volunteer information unless you ask).

After that we will move to Software design (architectural, i.e. overall structure of the system, and needed subprograms, objects or modules and their inter-relationships). At this point you should develop visual interfaces to show how the program will appear to the users, screen after screen. At this point we will discuss program algorithm in great detail. Create database design, primary and secondary keys, names of files, etc. Only after these steps are completed you will start the coding. If time permits, we will go to Software validation (making sure that it does what the customer wants), where the software is checked to ensure that it is what the customer requires. We will not have time to explore Software evolution, where the software is modified to reflect changing customer and market requirements.

Now to the project. All of you have used Dell website. Assume, Mr. Michael Dell is starting the business and came to you, the CSCI6400 group to create a software to manage the whole system, from buying parts to selling systems, keeping track of retail and wholesale customers, purchase orders and accounts payable, accounts receivable and collections, banking, sales tax, employee commissions, return merchandize authorizations (RMA), Customer support, Maintenance, download sites, etc. Customers do not generally know how to explain what is needed, that’s why you need to interview and ask detailed questions. Your professor will be the designated person by Mr. Dell to answer your interview questions.

I know you will enjoy this semester even though it is a lot of work.

Dr. Abraham

Professor