

## CMSC 735 Assignment 5

November 26 2002  
Due December 10, 2002

Hypothetical scenario: A major software development organization has decided to improve the “dependability” of their software. (Dependability can have many attributes, e.g., reliability, availability, maintainability, safety, security, robustness). For achieving this goal they are considering introducing a new technique for the construction or analysis of their software.

You are supposed to help this company decide whether or not using certain techniques will improve dependability of the software they are developing.

You will form research **teams** of 3 to 4 **experimentalists**.

Each **team** should select a **technique** that will be the central focus of their study. Use a GQM goal template to specify the technique and provide some procedural steps.

**Each experimentalist** in the team will define a **model and its associated measures** for a different attribute of dependability (you may choose any attribute or set of attributes you think define dependability). Two experimentalists may choose the same attribute but they should define very different models for the attribute.

As a **team** you will select one of the following two hypothetical situations below (Situation 1 and Situation 2) and **design an experiment or quasi-experiment** that can be used to evaluate the ability of the selected technique to contribute to the improvement of the product attribute(s) you have specified. Point out the threats to validity of the design.

Each **experimentalist** should write a GQM evaluation goal (use the GQM template) and give a specific, detailed evaluation model for their attribute that they could implement and learn from. You should specify the associated questions and metrics. Make it clear how the results should be interpreted.

Situation 1: The company wants to evaluate the technique during the training course (when this techniques is taught to their staff) and improve it based upon what they have learned. Design an experiment that will allow them to evaluate the process in a classroom situation and learn enough to make improvements in its feasibility and effectiveness relative to the attributes chosen.

Situation 2: The company wants to study the technique on the real application. They are open to options, e.g., use it on half of the project but not the other half. If you assume they have data from prior projects, specify what data.

Each **team** should hand in the definition of their technique and the experimental design (MAXIMUM of 2 pages, 12 size times font).

Each **experimentalist** should attach their attribute model, their goal for and interpretation of the experiment, and the associated model and metrics (MAXIMUM of 4 pages, 12 size times font).