George Mack, Computer Science – WID Teaching Portfolio

F. Sample Assignments Produced and Carried Out Under the Writing Fellowship

Course: 420-315-DW, Programming IV – Advanced C# and .NET Programming

F-5. Sample assignment: Project-Based Cooperative Learning Through Jigsaw Assignments

This activity took place over a ten week period, weeks 5 through 15 of the semester, from February 24 to May 12, 2011. In addition to classroom and lab activities, a field trip was organized on April 14 2011 to give students direct experience with project subject matter (Koi fish) and with examining the information systems of an external organization.

Objectives: (a) use an object-oriented development environment; (b) develop and design applications in a graphical environment; (c) organize data; (d) develop conceptual models using a structured approach; (e) produce and manage design documentation; (f) analyze, design, program and implement an application; (g) carry out all objectives in a collaborative, jigsaw-style project structure, which implies interacting and communicating in various work situations by verbal and written means, and learning various workplace functions of a programmer-analyst. References: (Microsoft Corporation, 2010), (Jacobson, Booch, & Rumbaugh, 1998)

Competencies developed: 0004, 000F, 000L, 016N, 016T, 016U, 016V, 016Z, 0170, 0171, 0172, 0173, 017A, 017C.

Methodology:

Preparation:

A suitable project to be carried out for an external organization was identified. This was the development of a DBMS-based information system to support the operations of Koi (fish) Competitions. Obtain the necessary information from actual users (organizers and judges).

In-class Activities:

All project activities were carried out in small groups in class and lab periods. The groups varied in size from pairs of two (for most programming and some design and writing activities), to groups of five or six members for certain design tasks. Larger groups were expected to manage work subdivision internally, and did so with varying degrees of success. Membership of the larger groups was shuffled twice during the semester to provide additional experience in working with different types of people. I, the teacher, acted as project manager and customer liaison.

Students were expected to produce deliverables each week, including design documents and source files (from Microsoft Visual Studio 2010 Ultimate Edition design tools), data files and C# programs (solutions) in source files.

Among the tasks, the students:

Analyzed the features of the customer information system by reading customer produced documents and experimenting with their existing information system (to be replaced);

Carried out a brainstorming activity and produced concept map diagrams;
Produced use case diagrams in groups and compared them as a class to other groups' solutions;
Designed and documented competing OO and relational data models, then worked in new groups to analyze and combine the various data models;
Developed data dictionaries for two different database management systems (Oracle and Access);
Developed test data for the two target data base systems;
Created data bases, tables, relations and uploaded test data;
Designed user interfaces (forms) and specified related data validation requirements;
Coded and implemented user interfaces to input, store, update, delete and display data.

Follow-On Activity:

The course midterm and final exams assessed students' knowledge in these areas. The completed system components will become part of a finished system to be delivered to the customer.