1. **Number and title of course:** CS 169, Software Engineering

2. **Course objectives:** To have detailed knowledge of the object-oriented software development method, and to be able to apply it. To master the development of a medium size software application from the conception stage to deployment, using modern technologies. To experience working in a team. To master written technical communication.

3. **Topics covered:**
   - Software engineering processes
     - Object-oriented processed
     - Agile processes (Extreme programming)
   - Gathering requirements
   - Specifications
     - Unified Modeling Language
   - Design
     - Unified Modeling Language
     - Design patterns
   - Version control
   - Testing
     - Regression testing
     - Integration testing
     - Test generation
   - Debugging
     - General principles
     - Delta debugging
   - Runtime monitoring
     - Purify
     - Cooperative Bug Isolation
     - Diduce
     - Eraser (data race debugging)
   - Software security
   - Verification
   - Refactoring
   - Software reuse
   - Programming with Exceptions

4. **Relationship of course to program objectives:** The course contains a large software design and implementation project. By designing an application requested by a real customer, and by solving the problem from gathering of initial requirements to the final software deployment, students apply their engineering knowledge in a range of settings. They learn to communicate by preparing extensive technical documents and by learning to manage a large (7-person team). They learn to evaluate, select and use the latest software technologies, as used in contemporary software development practices.

5. **Prepared by:** Rastislav Bodik (3/30/06)