

Systems Development

Testing

<http://lbgeeks.com/gitc/systemsTest.php>

June 6, 2007

- **What is Testing?**
- **Test Types**
- **Test Documents**
- **Traceability**
- **Customer Acceptance**
- **Schedule Reminders**

What is Testing?

- **Did we build the system correctly?**
- **Map implementation back to requirements**
 - All requirements met?
 - Working properly?
 - Meets customer interpretation?
- **Separate, parallel engineering effort:**
 - Has design, implementation phases like coding
 - Can originate independently with requirements
- **Work best done by independent people:**
 - Employees not involved with development
 - Outside, independent consulting firm

- **Analysis**
- **Experiment**
- **Inspection**
- **Verification**

- **Test by dissection without running program**
- **Compare code with documentation:**
 - Demands complete, correct specification
 - Determine source code meets specification
- **Verify algorithms are coded correctly:**
 - Pseudo code is language independent
 - Must check source code for a match
- **Useful with verified automated productions:**
 - Source code to executable image
 - SQL database run time

- **Run program with specific test data**
- **Do inputs produce expected outputs?**
- **If results match expected, test passed**
- **Limitations:**
 - **Impossible to test with enough sample data**
 - **Difficult to exercise all code branches**
 - **Need knowledge of boundary conditions**

- **Verify requirement met by direct observation**
- **Useful for human interface aspects: forms, menus, reports**
- **No quality assessment: presence of item is sufficient to pass test**
- **Examples:**
 - **Interface accessibility by the visually impaired**
 - **Progress bar timing checkpoints**

- **Experiment + Analysis**
- **Compare tested system output with a known correct alternative**
- **Convert output from system to alternative**
- **Examples:**
 - **Flight controller compared with simulation**
 - **Chemical process control with end product**

- **Test Requirements**
- **Test Plan**
- **Test Procedure**
- **Test Steps**

Test Requirements

- **Testing runs parallel with other development**
- **Top-level specifications should have test requirements**
- **Some requirements may only apply to the testing effort:**
 - **Constraints on budget and schedule**
 - **Compliance on quality standards**
- **Such requirements are documented in a separate specification**

- **How will we pass each requirement?**
- **Choose testing method**
- **Guidance on source data for experiments**
- **Similar to preliminary design:**
 - **Define responsibility of each test**
 - **Interfaces for test coordination**

- **Definition of each test case**
- **Specifies inputs, activities, and outputs**
- **Includes pass/fail criteria**
- **Similar to detailed design: internals of each test specified**

- **Step-by-step procedure for test execution**
- **Written so novice can complete test and judge pass/fail**
- **Customers often witness test so steps must be clear and complete**
- **Similar to coding: every detail must be specified**
- **See example on course web site**

- **Everything in systems development must be requirements driven**
- **Must verify all requirements are met**
- **Test plan must have traceability back to unique requirement ID**
- **One test may verify multiple requirements**
- **Sometimes tracked in separate database**

Customer Acceptance

- **Customer may specify criteria for accepting developed system—or not**
- **Acceptance = payment!**
- **Criteria must be included in test plan**
- **Some customers, like government, hold acceptance test using independent party**

Class Schedule Reminders

- **Sessions at 19:00:**
 - **Monday, June 11**
 - **Wednesday, June 13**
 - **Monday, June 18**
- **This is the last unit of the course**
- **Quiz on Monday, June 18, 6:45 pm**
- **Unit 08 Assignment due July 4**
- **One assignment due every Wednesday**