

EAS561 Spring 2008 Assessment - Reliability Engineering June 2008[Eisenhauer]

Assessment Methodology

The assessment means for EAS561 Spring 2008 class consists of four parts: (1) Direct observation by the instructor, including verbal comments and suggestions from the students in the class, (2) Voluntarily submitted student evaluations given to students after final grades were posted, (3) Instructor experienced and student commented experience with online training system, and (4) Instructor experience with new textbook and supporting materials and their ability to convey the stated objectives of the course.

These means are evaluated by the instructor to determine key areas or topics that need to be continued or enhanced in order to achieve course and student goals. This is a continual improvement process in that assessment is performed after each term and rapid response to areas identified is planned with the intent of executing by the next time the course is taught.

Key Topic Areas

Key topic areas identified this term surround three areas: (1) Focus of objectives, (2) Increased interaction and collaboration opportunities, and (3) Ongoing assessment of student knowledge retention.

Consolidated Focus of Objectives for Course

Student feedback indicated a two track objective stream in the course. While the students indicated they enjoyed and benefited from the philosophical nature of the course, they struggled with putting the philosophical concepts into practice without a stronger understanding of the underlying techniques. The course attempted to be both a practical, working knowledge of reliability engineering while at the same time attempting to place reliability engineering into the overall scheme of responsibilities of the Systems Engineer. This dual track nature was not made clear to the students at the beginning and the course layout was not conducive to the alteration between the two different modes.

Inclusion of Annotated Examples to Illustrate Basic Concepts

Comments and feedback regarding the homework centered on the realistic nature of the homework problems, with real world issues and challenges in interpretation and analysis of reliability data. While a majority of the students appreciated the real world nature of it, a significant number of students argued that they would benefit greatly from the inclusion of "clean" data and simplified examples and exercises to illustrate basic concepts. They felt that having those would build up a foundation for the more complex exercises.

Streamlined and Enhanced Reading Assignments

While the textbook covers the primary objectives and the students felt it did a successful job as a textbook (political ranting of the author, from time to time, not withstanding) and both groups agree the text should be retained for next year, the students and the instructor feel that the textbook does not cover in detail some of the knowledge necessary to adequately interpret the data and understand ramifications of reliability analysis. Students indicated that auxiliary reading assignments and streamlining of the primary text reading may be useful.

Homework Assignment Consolidation

The homework was expressed as challenging and real worldly, however it was also expressed that the homework quantity did not allow for more in depth thought and analysis. A suggestion of a continual running case study coupled with simpler exercises for conceptual understanding may be of more benefit. In addition, limiting the homework volume and offsetting with assessment exercises was also suggested.

Inclusions of Continual Assessment Exercises

A number of students requested assessment vehicles in the form of quizzes would be helpful to reinforce understanding of basic concepts and to build confidence prior to engagement with the more complex written assignments.

Collaboration/Interaction Activity

The weekly discussion question and chat sessions, while appreciated, are inadequate to increase student collaboration. More than one student indicated desire for a team project, possibly in lieu of the case study, that would allow interaction and increase collaboration.

Short video lectures were experimented with this term which the students felt were helpful given the asynchronous nature of the course. While online learning is advancing, the psychological effect of viewing an active instructor's persona was indicated to have be of significant value. Students indicated that the videos should be enhanced and included in this and future courses. However, they also indicated that they should be used in conjunction with other course materials and not a replacement for them.

Blackboard Workflow and Interface Usage Clarification

This course was the first in the SYSE program to use the BlackBoard application. There were many implementation issues and adjustments that had to be made on both the part of the students and the instructor. While these did have a minor effect on student engagement, lessons learned were retained to enhance future courses migrating to this platform as well as some best practices communicated to other SYSE instructors prior to their migration, to hopefully mitigation the issues in the future.

Action Plan

Auxiliary Readings

Instructor will locate and post links to auxiliary readings that cover in detail or from a different perspective the topics in the course that are not adequately covered in the primary text.

Term Project Inclusion

Course material will be adjusted in the second week to allow the addition of a project overview, expectations, and team building segment. In addition, three graded critical project area check points will be interspersed through out the course. This will encourage the forward progression of the project effort, as well as allow the instructor ample time to review and address any deficiencies in time for student correction. Continued open office policy for pre-final submission review will be encouraged.

Simplified Exercises

The primary text has very few simplified exercises to assign, thus the instructor will create exercises focused on the core concepts with clean data to reinforce. These will be assigned in addition to the main homework assignment to put those concepts into practical use. A reduction in the amount of homework will be made to accommodate the term project (see above). However, the pre-requisite of engineering probability and statistics knowledge will still be adhered to and the simplified exercises will focus on reliability concepts and not basic probability and statistics review.

Quiz Incorporation

Blackboard's assessment feature will be explored and the inclusion of quizzes will be added to the course. Decision still needs to be made as to if these will be self-assessment or graded evolutions. Currently the intention is for these to be self-assessments and will not impact the overall grade.

Enhanced Video Lecture Materials

Due to the overwhelming response to retain this mode of instruction the video lecture materials will be enhanced and the entire course will incorporate video segments for concepts that will benefit from an instructor demonstration.

Use of Adobe Captivate within BlackBoard

Since the Reliability Course typically deals with interpreting analysis and graphs, the use of Adobe Captivate for demonstrating on-screen what the instructor is looking at when commentary is made will be experimented with for next offering of the course.

Expected Date of Implementation of Action Plan

Spring 2009

Rubrics

Rubric	5	4	3	2	1
Distance Learning - Instructional Design	In addition to the requiring students to communicate with the instructor, instructional activities require students to work with one another (e. g., in pairs or small groups) and outside experts and share results with one another and the rest of the class.		In addition to the requiring students to communicate with the instructor, instructional activities require students to work with one another (e. g., in pairs or small groups) and share results within their pairs/groups		Instructional activities require two-way interaction between instructor and students. They call for one-way delivery of information (e. g., in lectures, text delivery).
Distant Learning - Learner Response	By the end of the course, over 75% of students in the class are initiating interaction with the instructor and other students on a voluntary basis (i.e., other than when required).		By the end of the course, between 25-50% of students in the class are initiating interaction with the instructor and other students on a voluntary basis (i.e., other than when required).		By the end of the course, students in the class are interacting with instructor and other students only when required.
Distant Learning - Instructor Responsiveness	Fully student engagement from instructor even outside of learning platform. Students proactively comment on instructors accessibility		Limited instructor engagement. Students comment either verbally or written, on lack of feedback or inquire more than twice on homework status or key dates		Instructor effectively communicates. Student are left with little feedback, comment to professor on whereabouts of instructor.
Engineering - Application	Course fully integrates with actual industry problem that may run through entire course. Tangible outputs from course activities used by industry sponsor		Course could provide meaningful starting point or template for actual engineering scenario. Students are presented with pragmatic realities of application and problems demonstrated are of a complex nature.		Course contains little application of actual engineering problems without need for more in-depth study. Focuses primarily on introductory concepts or solutions of key issues. Concepts presented with toy problems and do not transition into pragmatic real-world application
Engineering - Theoretical	Fully documented theory presented and derivation presented as well as exercises in course to apply theoretical foundations to require student to determine the applicability of theory to given situation		Course provides some theoretical foundation for concepts. Extrapolation possible, however will require external study to understand limitations and ability to formulate new techniques. May provide general methodologies/algorithms used in tools presented.		Course entirely focuses on application, little theoretical grounding presented to support extrapolation of concepts to other domain areas. Course focuses on the training of students rather than on the concepts surrounding the tools developed
Engineering - Tools/Techniques	Integrated use of tool presented or required in course long project. In-depth functions of tool utilized and/or presented. Student would be considered at least beginner skilled with tool upon completion of course		Tools/Techniques presented to level that student could make substantial headway on a tangible project. Working knowledge of technique expressed or demonstrated by at least one assignment.		Tools/Techniques presented primarily introductory. Application limited to basic functions and tutorial problems.
Systems Engineering Program Integration	Draws substantially on other SYSE courses, refers to them in course material and has expectation that students fully understood concepts and they are not summarized within course. Course efforts make up significant portion of 590 portfolio		Course draws on other SYSE courses, but could adequately succeed if effort was exerted. Course spends time summarizing potentially missing information, rather than requiring assuming knowledge. May have some ties to 590 project.		Disjoint class with no ties to SYSE course or 590 Specialized domain topic.
Value Perception	Students recommend course to peers. Student comments indicate applicability or value to current job without further study. Text books are retained (e.g. low used book count)		Students express need for course, but all majority express desire or expectation for more material, tools, techniques.		No student comments, solicited or unsolicited, re: application current job. Most one student expresses irrelevance of course. Any students comment to dean of low value course

