

Distributing Course Materials Through Online Assistance

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Abstract

Often times a professor encourages students to review lecture topics, book chapters, and papers prior to class. This preparation allows students to become familiar with the lecture subject and provides opportunity for in-class discussion. It is also ideal in a laboratory setting to distribute experimental data to the entire class with minimal effort. The author currently utilizes a web-based educational tool called Blackboard™. This online resource allows instructors to distribute course information, lecture notes, handouts, papers, and laboratory data to students. Group pages are created to allow laboratory groups to communicate and transfer data to one another. The first author currently teaches a junior level civil engineering materials course at the University of Colorado at Denver and Health Sciences Center. This course has been taught with and without Blackboard™ assistance. The course CE 3141, Materials Testing Lab, is taught more effectively as a result of distributing course materials and data online. Laboratory groups process data and develop laboratory reports without meeting through online group communication and file download capabilities. This mode of delivering materials to students eliminates printing and copying by the instructor and distribution during class time. Grades can be posted by the instructor and viewed by students. The tools available using online assistance allow students to access course announcements, lecture notes, lab handouts and data at any hour of the day. In addition, a course can be taught completely online with digitally recorded lectures. Students comment on being better prepared due to having seen the lecture notes and handouts prior to class. Web-based educational tools can enhance the learning experience in the classroom.

Introduction

Many times it is ideal for students to have access to course notes, handouts, laboratory data, and other items prior to class time. This allows students an opportunity to prepare for class by reviewing lecture and/or lab information. This preparation allows students to become familiar with the lecture subject and provides opportunity for in-class discussion. It is also ideal in a laboratory setting to distribute experimental data to the entire class with minimal effort. The author currently utilizes a web-based educational tool called Blackboard™ [1]. This online resource allows instructors to distribute course information, lecture notes, handouts, papers, and laboratory data to students. In addition, this tool is used to communicate with the entire class through page announcements. Group pages are created to allow laboratory groups to communicate, transfer data, and create laboratory reports. The first author currently teaches a junior level civil engineering materials course at the University of Colorado at Denver and Health Sciences Center, UCDHSC. This course has been taught with and without Blackboard™

assistance. The first author has found the course CE 3141, Materials Testing Lab, to be taught more effectively as a result of using this web-based tool. Laboratory groups process data and develop laboratory reports without meeting through online group communication and file download capabilities. This mode of delivering materials to students eliminates printing and copying by the instructor and distribution during class time. By reducing the amount of time prior to class to print, copy, and organize lecture materials, the instructor can better prepare for class. Grades can be posted by the instructor and viewed by students. The tools available using online assistance allow students to access course announcements, lecture notes, lab handouts and data at any hour of the day. Students have stated that courses with Blackboard are more organized and more effectively taught. The author has found that web-based educational tools enhance the learning experience in the classroom. In fact, Byrne and Tang state that provided the same content, instructor, and assessment, students prefer being taught using a blended environment in which online technology and tools are utilized [2].

Course Setup

The CE 3141 – Materials Testing Laboratory course taught at the UCDHSC is taught using the Blackboard online system. At the beginning of each semester, each student enrolled in the course is automatically placed into a Blackboard “shell.” This shell contains the tools that are discussed in this paper and used to improve the delivery of this course. Only the instructor has authorization to format the Blackboard page. It is the instructor’s responsibility to format the course shell to include the sections and resources used in the class. The course shell allows you to create course specific folders and upload files. See Figure 1. The folders used for the CE 3141 course include:

- Course Information
- Lecture Notes
- Lecture Videos
- Laboratory
- Homework Assignments
- Class Project
- Extra Credit

Each of these folders contains information that would traditionally be distributed during class time in hard copy. With the course information and handouts online, the students can access this information at anytime and anyplace. This also reduces the amount of printing and copying by the instructor prior to class time and enables the instructor to better prepare for class.

Course Information

Pertinent course information is uploaded into the course information folder. The course information folder contains the following files:

- Course Syllabus
- Lecture/Laboratory Schedule
- Other Handouts

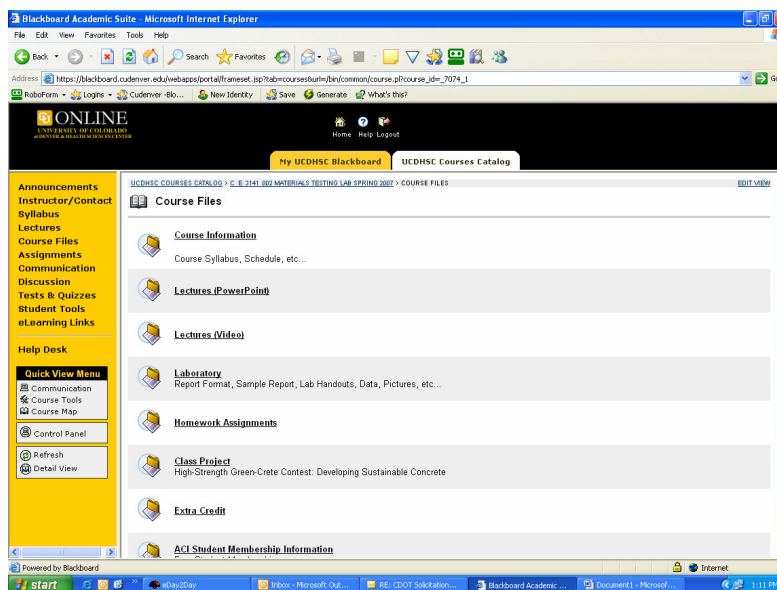


Figure 1. Course Files Page on Blackboard Shell

These files are uploaded into this course file prior to the start of the semester. In addition, these files remain on this webpage throughout the entire semester. Students will often comment on the benefits of having the lecture and laboratory schedule on the web. This allows students a method of keeping up-to-date with course topics throughout the semester.

Lecture Notes and Videos

An advantage of using web assistance is the ability to post the class lecture notes prior to class time. The first author will typically upload the lecture notes three to four days before class. Posting the lecture notes provides the students with an opportunity to review course lecture handouts. This will often create great discussion on course topics. Students have commented on how obtaining the notes digitally prior to class enables them to focus more on the lecture and less on trying to write down everything the instructor says. Figure 2 shows the typical webpage listing the lecture notes and sample lecture notes.

Beginning in the Spring 2007 semester, the author began digitally video taping each class lecture. These digital recordings are formatted into a window's media file and uploaded onto the Blackboard course shell. It is the goal of the instructor for the videos to supplement the in-class lectures. The CE 3141 course includes weekly quizzes that cover material from the previous lecture. These videos can be used to review the previous lecture prior to the quiz. It is also noteworthy to state that a similar web-based system is used in another course at the UCDHSC that does not include weekly quizzes and the class attendance has not been affected. With the use of digital videos and the other teaching resources mentioned in this paper, a course could be taught totally on-line.

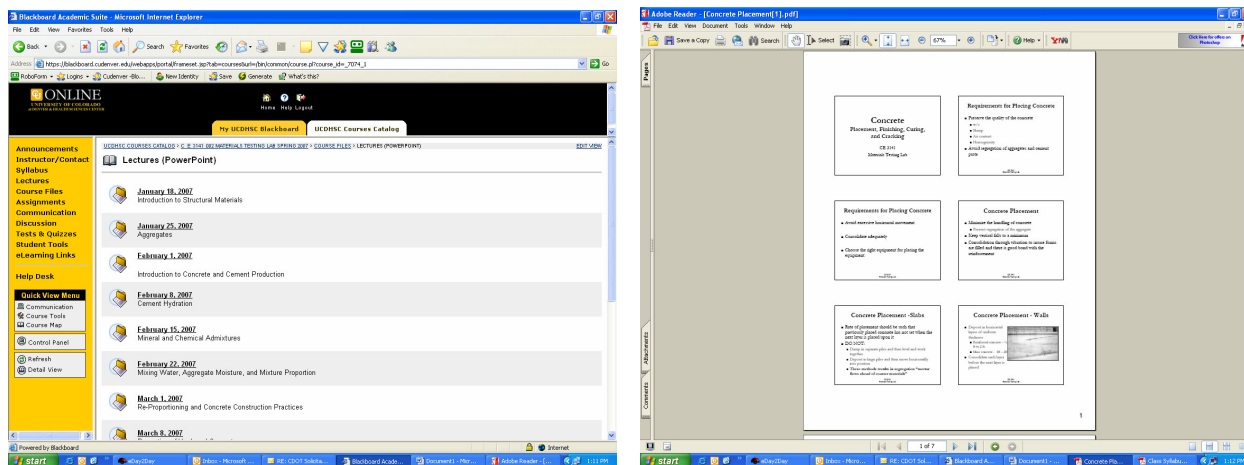


Figure 2. Lectures Organized by Date and Sample Lecture Notes

Laboratory

The course page may be most effective in distributing laboratory information and data. The CE 3141 course is structured to include a one and a half hour lecture and a two hour laboratory session. Prior to the laboratory session the handouts that include the experimental description and report details, laboratory procedures, and supplemental handouts are posted. In addition, at the conclusion of the laboratory experiment, the data obtained is then posted online such that all groups can easily obtain the data from their experiment. This is very effective when conducting laboratory experiments that produce large data files. Students will then access these data files and format the data, develop tables, and create plots to be included in their laboratory report.

In addition, many students will take pictures documenting the laboratory experiment. Students are encouraged to use these pictures in their laboratory reports when describing the experimental procedure. A folder is created for each laboratory that contains pictures. Pictures are uploaded to this folder with each student having access.

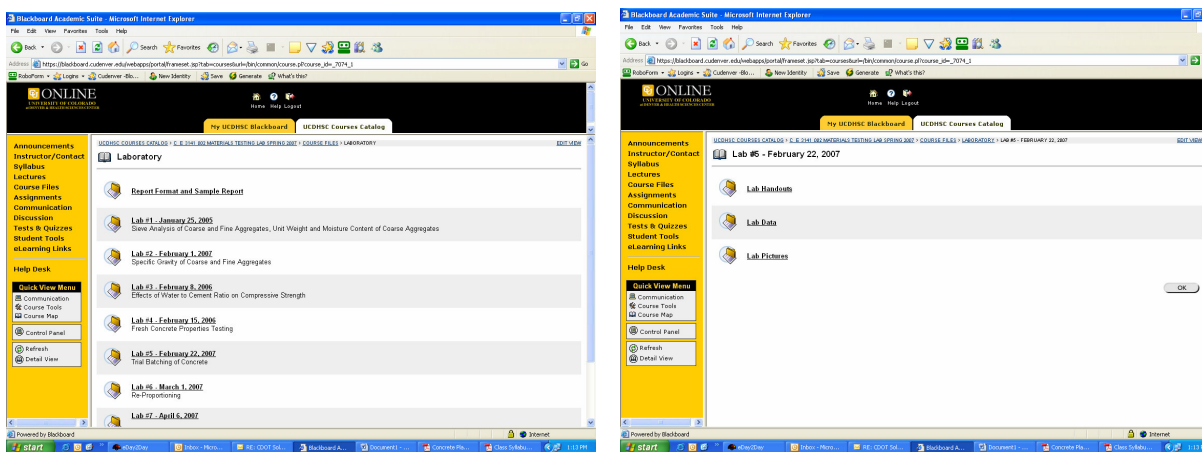


Figure 3. Laboratories Organized by Date and Sample Lab Folder

Each group contains their own page within the Blackboard shell. Only members within a particular group and the instructor can access the group pages. The group pages are an effective tool allowing each group to communicate with one another through e-mail, discussion boards, and file uploads. With the file upload capabilities, group members work on their individual sections of the report, upload them to their group page and then combine all the sections of the report prior to submittal. This capability is particularly important at the UCDHSC where a majority of the students work full-time. This allows them to work on the laboratory report off campus and compile the report completely online. Figure 4 shows a typical group page.

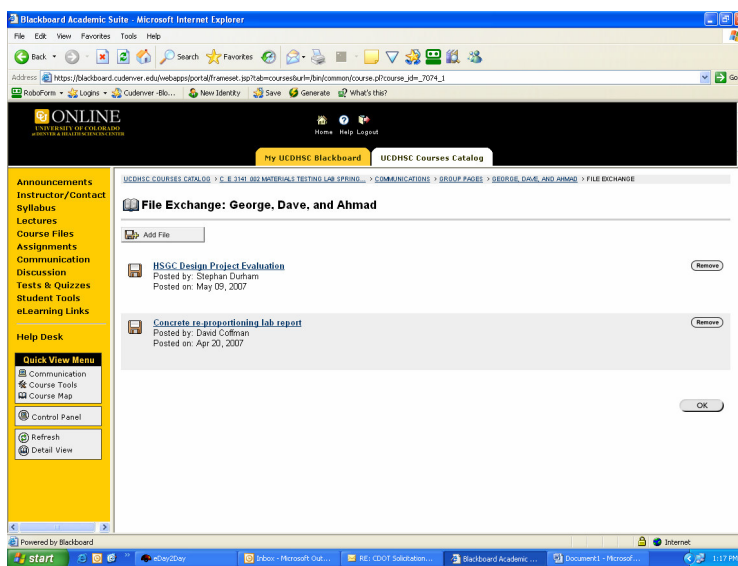


Figure 4. Group Page with Files Uploaded

Homework Assignments

Homework assignments are posted to the course shell. In addition, solutions to the homework assignments are posted. This provides the students the opportunity to review the solutions to problems prior to a quiz or exam. Furthermore, if class time is not available to review the course assignments, the complete solutions are accessible to the students. Figure 5 shows the course file that contains the homework assignments and solutions. In addition to posting the homework assignments and solutions, the date for which the assignment is due can be listed.

Class Project

A design project is often included into many courses. The CE 3141 course contains a design project in which the students must design, construct, test, report, and present. This course shell allows the design groups to communicate during the design phase, post design calculations and data results. The group can also upload their design report prior to submittal and post their PowerPoint presentation.

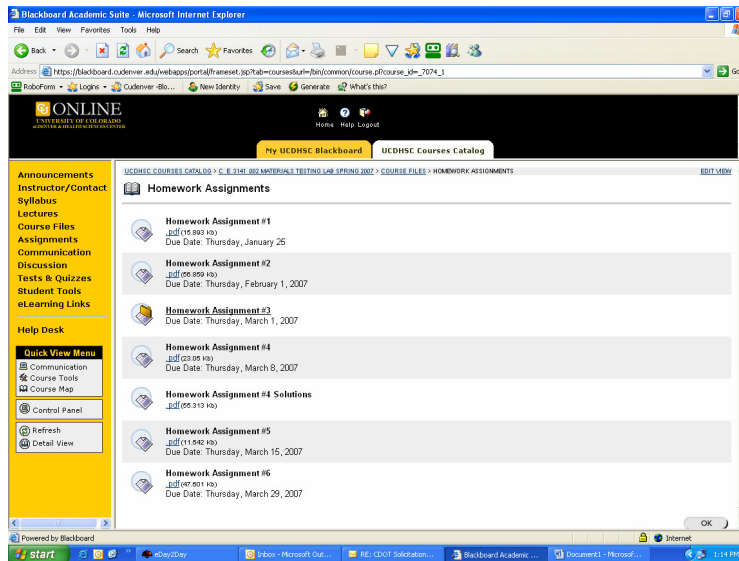


Figure 5. Course File Containing Homework Assignments and Solutions

Conclusion

Teaching with web assistance has proved to be effective for the CE 3141 – Materials Testing Laboratory course at the UCDHSC. The tools and methods discussed in this paper can be used for any class at any university. Using web-based educational tools, the instructor is capable of posting course information, lecture notes and video, laboratory handouts and procedures, and homework assignments. Furthermore, students use the course shell to communicate with one another, upload laboratory files and compile reports. Students have often commented how obtaining the lecture notes digitally prior to class is helpful. The author has found the use of this internet tool to be effective for the course discussed in this paper.

References

1. BlackBoard™ (2003). Blackboard Academic Suite™ (6.3.1.593) Blackboard Learning System™, Blackboard Community System™, Copyright © 1997-2003, Blackboard Inc.
2. Byrne, R. and Tang, M. (2006). "Evaluating online, blended and traditional postsecondary instructional methods as measured by student and instructor surveys." *4th International Conference on Education and Information Systems, Technologies and Applications*. Orlando, Florida = orlando paper. July 20-23, 2006.

Biography

STEPHAN A. DURHAM is an assistant professor at the University of Colorado at Denver and Health Sciences Center in the Department of Civil Engineering. He obtained his MSCE and Ph.D. degrees from the University of Arkansas in the area of repair and strengthening of concrete bridge superstructures. He teaches a junior level construction materials course. His interests include concrete materials and repair.

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