

Course Syllabus

EDUC 885-010: Advanced Topics in Web Design

EDUC 885-011: Advanced Topics in Multimedia Design

EDUC 885-040: Data Driven Web Design

EDUC 885-156: Online Version of Advanced Topics in Web Design

EDUC 885-157: Online Version of Advanced Topics in Multimedia Design

Background

EDUC 885 is a repeating topics course that is offered as part of the University of Delaware's doctoral program in educational leadership with a specialization in educational technology. In the educational technology master's program, students who have completed the three educational technology core courses are permitted to enroll in EDUC 885 as an advanced technology elective. In the Division of Continuing Education, students completing the WebMaster Certificate Program can elect as their capstone course either Advanced Topics in Web Design or Multimedia Design. Combining all of these students in the same course creates a synergistic learning community in which students combine their talents and skills in creating advanced multimedia Web sites.

Format

To accommodate the needs of adult learners, EDUC 885 is offered in a wide variety of formats. Students can enroll in a classroom version of the course that meets weekly on Monday nights from 7-10 PM, or students can take the course online in a virtual classroom format. Online students may attend the Monday night session at any time to meet and interact with classroom students in person. Classroom students who encounter scheduling conflicts are permitted to become virtual and attend class online during weeks when they cannot attend class in person. Regardless of whether EDUC 885 is taken in the classroom or online, all students participate at the course Web site, which uses cooperative learning strategies to create a learning community in which students work together to form teams that create effective multimedia Web environments.

Course Description

This course is a practicum in which participants form teams to design and develop an advanced Web environment. Each team selects a topic and conducts research on what has been learned by other groups developing applications in the content area. Informed by this research, the team designs a Web-based environment and presents it for critique and discussion by the entire class. Then the team selects an appropriate hardware platform and suite of development software. Participants comment on progress as the environments undergo development on the Web. Each team member logs project contributions into an online portfolio that is used for grading purposes.

Repeatability

There are three ways to enroll in this course. Students who want to emphasize the design of advanced Webs enroll in EDUC 885: Advanced Topics in Web Design. Students who want more of an emphasis on multimedia design enroll in EDUC 885: Advanced Topics

in Multimedia Design. Both courses meet concurrently on Mondays at 7 PM in the Pearson 006/007 computer lab when students take them in a classroom format. When students take the online versions, both of these courses meet in the same virtual classroom in which students interact and communicate through a common chat room, discussion forum, and gallery. Both courses are repeatable in the sense that the registration system permits graduate students to take them more than once. Students who take these courses at the master's level may choose to take them again in a subsequent doctoral program, either to pursue newly emerging technologies, or to delve in more depth. Students who discover they have a knack for scripting, for example, may choose to take the course again to deepen their skill level and unleash their full potential. The cooperative learning environment makes it possible for students to take the courses once from a visual design perspective, and again from a programming perspective.

The third way to take this course is to enroll in EDUC 885: Data Driven Web Design during the summer session. The purpose of Data Driven Web Design is to provide intensive study and help with the database portions of the course. The database chapters are often the most difficult for students to master. During the summer, EDUC 885 focuses on the data driven aspects of advanced Web design. Students take the summer course either totally online or in a hybrid format, with half of the instruction provided online, and half taught through direct instruction in a computer classroom. Online students have the option of attending the classroom session at any time.

Textbooks

This course has two textbooks, of which one is required, and the other is optional. Written by the course instructor, the required textbook is entitled *Advanced Web Design* (AWD). This book is unique in that students can choose to work either from a visual design or programmatic perspective. Graphical tools let students work visually without needing to learn how to program. Scripting tools help students write computer code to create advanced webs programmatically. The AWD book covers both kinds of tools and lets the students choose whether to develop their webs graphically, programmatically, or both ways interchangeably. The AWD book's publisher is McGraw-Hill, ISBN 0072565942.

The second textbook deals with instructional design. This instructional design textbook is optional for students who are not education majors. Students in the WebMaster Certificate Program, for example, are not required to purchase this book. School of Education graduate students, on the other hand, are strongly encouraged to purchase the instructional design textbook. Its title is *The Systematic Design of Instruction*, fifth edition, by Walter Dick, Lou Carey, and James Carey. The publisher is Addison-Wesley, ISBN 0321037804.

Grading

Three kinds of assessment determine the student's grade in this course. First, students are graded on the quality and quantity of their class participation. Elements of class participation include initiating and discussing topics in the online discussion forum, joining and using the course e-mail list, sharing tools with fellow classmates, and

attending project development team meetings that are held either physically for classroom students or virtually for online students. Second, each student keeps a log of individual contributions toward the team project. Three times during the course, the instructor inspects these portfolios and assigns a grade for the quality and quantity of the student's contributions toward accomplishing the project's goals. Finally, students receive a grade for their project as a whole. In the classroom version of the course, each team presents its project during one of the final meetings of the class. In the online version of the course, students present their final projects over the Web in the virtual classroom's gallery.

Infrastructure

The cooperative learning model used in this course is powered by Serf, which is a Web-based educational environment that provides collaboration, presentation, assessment, and community-building services. Each student receives a Serf account that provides access to the detailed syllabus, gradebook, discussion forums, e-mail list, galleries, and assignments. At any time, students can log on to see the current class, read and respond to messages in the forum, check the status of their assignments, and see their current grade average. An index and a full-text search service provide quick access to course content. The instructor participates along with the students to foster the create of learning communities devoted to researching, designing, and creating advanced Webs to solve the problems addressed by the development teams. In the gradebook, the instructor assigns grades for the quality and quantity of student participation in this process. This gradebook has the option for the instructor to give the student another try when the student misunderstands or needs coaching to achieve better results. When coaching is needed, a just-in-time discussion gets attached to the assignment, logs the interaction between the instructor and the student, and tracks the resulting improvements. Because of this built-in coaching model, almost all students are able to achieve the course objectives.

Weekly Course Outline

There are fourteen weekly class modules. The online syllabus contains a highly detailed outline of material covered in each class. Printed here is a summary that shows how the course guides the students through the following strategic processes:

- (1) Community building. Students meet each other, discuss common interests, choose topics, and form development teams.
- (2) Visualization. Through visualization exercises, students learn how to shape a Web and stylize its navigation onscreen.
- (3) Scripting. Students try their hand at scripting, which is the process of writing little computer programs that make Web sites dynamic.
- (4) Data access. Students learn how to design and create a relational database, which enables Web page contents to be determined by what is going on in the database. Programmers learn how to write scripts that interact with a database, while graphically oriented students use database interface wizards.
- (5) Instructional Design. Students creating educational projects adopt or develop a theoretical framework and create an instructional design for bringing that theory into practice.

- (6) Visual Studio. Students are given the option of working with Microsoft's professional development environment, Visual Studio.NET.
- (7) XML. Students are given the option of using the extensible markup language (XML) to synchronize multimedia events, enrich the user experience, and make media more accessible.
- (8) Deployment. Students learn how to deploy their advanced Webs and share any tools created by their development team.

Week 1

Students receive an orientation to course goals, organization, resources, logistics, and grading procedures. The instructor demonstrates the advanced Webs that students will create by completing the tutorials in the hands-on exercises. During the week, students read chapter 1 of *Advanced Web Design* (AWD) and reflect on what makes a Web advanced. Time is provided for students to introduce themselves, state why they enrolled in the course, and summarize their topical interests for possible team development projects. At the Serf site, all students (classroom and online) enter a statement of their goals in response to the Goals assignment, which is an essay question that asks why the student decided to take this course and what the student hopes to get out of it. The Goals assignment has a gallery, which permits the students to see each other's goals. In the discussion forum, students discuss each other's goals and begin to identify common interests.

Education students read Dick and Cary, chapters 1 to 4. These chapters present and discuss the systems approach to instructional design. Students plan the process of determining and analyzing instructional goals, analyzing learners and contexts, writing performance objectives, developing instructional strategy, creating the application, conducting a formative evaluation, revising the application, and conducting a summative evaluation.

Week 2

Following the advice in AWD chapter 2, students decide what kind of server environment will host their Webs. In chapter 3, students learn how to create Web pages that prompt the user to enter information that gets stored in a spreadsheet where the user's answers can be tabulated and analyzed. The instructor mines the student goal statements and leads a discussion aimed at deciding what topics the students will pursue in their projects, and which students will serve on each project's development team. At the Serf site, each student registers the e-mail address to which messages from fellow students should be sent.

Education students read Dick and Carey, Chapters 5-8. These chapters guide team members through the process of analyzing learners and contexts, writing performance objectives, developing assessment instruments, and adopting an appropriate instructional strategy.

Week 3

Following procedures taught in AWD chapter 4, students learn how to visualize and shape a Web by moving objects in its Navigation view. The instructor conducts visualization exercises that extend this concept into the third dimension. As pages drag and drop to create different navigational designs, students discover how to create webs with different levels of navigational complexity. The more complex the web, however, the longer it can take the users to navigate where they want to be in it. To provide users with more direct pathways, students learn how to create link bars that streamline the navigation. During the last hour of class time, students begin to meet in teams. During the week, the instructor grades the listserv assignment and reminds any students who have not joined the list to sign up.

Education majors read Dick and Carey, Chapter 9. This chapter covers media selection and the criteria for judging the appropriateness of existing instructional materials. Students decide what pre-existing materials can be used and plan the development of new materials based on the project's instructional strategy.

Week 4

Students work through AWD chapter 5, which teaches how to use cascading style sheets to stylize entire web sites, selected web pages, and individual web page elements. The instructor demonstrates how productivity increases when the style of a Web can be modified without needing to edit its content. Students learn how to create shared borders containing banners and navigation buttons that update automatically when changes occur to a page's title or navigational positioning.

The last hour of this class is a practicum in which students meet in teams to work on their projects. The instructor circulates among the teams to offer help and advice in programming and design issues. Online students get assistance by discussing their project's issues in the discussion forum.

Week 5

All students are encouraged to try learning how to script by working through the scripting primer that constitutes the third part of the AWD textbook. Students who can script are able to create their own programming as opposed to relying on components programmed by others. Three scripting languages are covered: JScript and VBScript for use in server-side programming, and JavaScript for client-side scripting. After learning when it is best to use each language, students decide to program in the language of their choice. In team meetings, students plan the roles they will play in creating their projects. During the week, students submit their "cool tool" assignments, in which the students share and instruct each other in the use of their favorite tools.

Week 6

At the beginning of the course, the students learned that an advanced Web design involves the use of a database to store information gathered or accessed by pages at a Web site. Part 2 had the students created a Web site containing forms that asked questions. In Part 3, students wrote scripts that judged the answers. Here, in Part 4 of the

AWD book, students learn how to store the results in a database and create data-driven Web pages whose contents change dynamically depending on what is happening in the database. Graphically-oriented students learn how to do these things using wizards. Students who can script learn how to write their own custom data objects that can do things for which the wizards are not preprogrammed. On teams, visual students combine skills with programmers to create Webs that are both graphically compelling and structurally sound.

Week 7

Visual Studio is a more advanced authoring environment. Based on Microsoft's .NET Framework, Visual Studio makes it possible to create multi-tiered Web applications, Windows forms, and XML Web Services. Within Visual Studio is ASP.NET, which is the next version of Microsoft's Active Server Page (ASP) technology. In week 7, students get introduced to the .NET Framework, which is covered in Part 5 of the AWD textbook. The instructor helps all students work through a simple clock project, through which the basic tools and features of ASP.NET are demonstrated.

Week 8

Security is one of the most important principles of advanced Web design. Users must be able to trust that a site is keeping records secure. This is the topic of the Top Secret Project, which Part 6 of the AWD book teaches. In the Top Secret Project, students learn how to (1) create a database of registered users; (2) use ADO.NET database objects to add, update, or delete users; (3) configure a Web site to use forms-based authentication and create a login form; (4) set an authorization cookie that provides authenticated users with access to top secret information; (5) deny access to unauthenticated users; and (6) create user controls consisting of reusable code segments that can be dropped onto the design surface of any Web page in the project.

Week 9

Students submit the first of three bi-weekly logs into their project's Web portfolio. The purpose of these logs is twofold. First, the logs inform the instructor about each individual student's contribution toward the team project. Second, the logs enable the instructor to study the work of each project in progress and offer help or advice in areas of special need. In special cases, a student may obtain permission to work on an individual project as a team of one. Students working as a team of one still complete the bi-weekly logs, to keep the instructor informed of their progress. The logs are galleried; at any time, students can go in to the gallery to see each other's project reports.

Week 10

The instructional management system (IMS) has become a multibillion dollar industry, and there are dozens of systems competing for a share of this market. During week 10, students take a look at the alternatives, including Blackboard, WebCT, Click2Learn, and Serf. At the Landonline site comparison matrix, students compare the strengths and weaknesses of more than a dozen systems. At the Node, students find a searchable database of research studies and critical reviews. At the Asynchronous Learning Networks (ALN) site, students find a refereed scholarly journal devoted to researching

the potential of dozens of Web-based instructional management systems and communication environments listed in the ALN catalog. At the IMS Global Learning Consortium site, students can see the progress of the open standards that are emerging for defining protocols for the interoperability of instructional management systems.

Week 11

Students submit the second bi-weekly log into their project's Web portfolio. The instructor mines these logs and makes classroom presentations on solutions to common problems or challenges reported in the logs. The last half of the class is a practicum in which teams meet to work on their projects. The instructor circulates among the teams to coach and assist as needed.

Education students read Dick and Carey, Chapter 10, which discusses the role of subject-matter and learner specialists in formative evaluation and compares one-to-one versus small-group evaluation. Students develop procedures for conducting field trials, cast formative evaluation in the performance context, and discuss techniques for data collection.

Week 12

Behind the scenes, when a developer designs an advanced Web, the extensible markup language (XML) gets used in important ways. Part Seven of AWD introduces XML and explains why it is important in advanced Web design. Students learn how to use extensible style sheets to transform XML documents into different formats at runtime. After designing an XML schema, students learn how to use an XML module to synchronize multimedia events, enrich the user experience, and make media more accessible. Then students are shown how to create a distributed application that uses an XML Web service to exchange data over the Internet.

Education students read Dick and Carey, Chapter 11, which deals with analyzing data from one-to-one, small group, and field trials. After comparing the analysis of objective data to the process of analyzing attitudinal data, students reflect on how formative evaluation data should inform the revision stage in their team's project. Then students determine how to revise the project based on formative evaluation data.

Week 13

Students submit their final bi-weekly project log. Selected teams present their final projects in class. During the presentations, classmates take note of remarkable content or design issues in the projects. After each presentation, classmates provide immediate feedback in the form of a discussion about the project. Online students hold this discussion in the virtual classroom's forum.

Education students read Dick and Carey, Chapter 12, which discusses the importance of the expert judgment phase and the field-trial phase of summative evaluation. After creating a checklist for the content analysis and the design analysis of their team's project, students create a form for feasibility analysis to judge the project's utility.

Week 14

The final class is devoted to project presentations, discussions, and feedback from fellow classmates. In the gradebook, the instructor gives each team member the same final project grade assigned to the project as a whole. Individual students may receive different grades, however, on their bi-weekly contributions to the project. After class, the students continue discussing their projects in the online discussion forum. Through the virtual classroom's gallery, online students are able to run projects created by classroom teams, and vice versa. Online students comment on the projects in the virtual classroom's forum, where classroom students likewise join in the discussion.

Weighting of Assignments

Final grade averages are computed automatically by the course Web site according to the following percentages, which show how much each assignment weighs in to the student's final grade:

Assignment	Weight
Statement of Goals	7%
Joining the Listserv	5%
E-mail Registration	5%
Discussion Forum Participation	10%
Cool Tool Presentation	10%
Project Contributions Log I	10%
Project Contributions Log II	10%
Project Contributions Log III	10%
Final Team Project	33%

Grading Scale

The following scale translates percentages into grades:

Percent	Grade	Percent	Grade
97 to 100	A+	77 to 79	C+
94 to 96	A	74 to 76	C
90 to 93	A-	70 to 73	C-
87 to 89	B+	67 to 69	D+
84 to 86	B	64 to 66	D
80 to 83	B-	60 to 63	D-