Course Web Sites: State-of-the-Art

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Abstract

To assess the state-of-the-art of course Web sites, 230 such sites were visited and their characteristics analyzed on 16 key factors. Our analysis of these sites revealed that most provide only one-way communication from instructor to students. Few provide ways to send feedback to the instructor other than via e-mail, and even fewer provide ways to interact with other students. We also surveyed faculty at various institutions on course Web site development and maintenance. That survey revealed that time is the biggest obstacle to improving course Web sites or having them at all, even when using commercial tools. We found that most faculty develop and maintain their own sites, even when help is available from a university Web office.

1 Searching for Information on Course Web Sites

Course Web sites have not been discussed at length in either electronic and paper publications. We therefore performed an extensive Internet search to try to identify their state-of-the-art. The majority of sources found were guides and books with guidelines for creating course Web sites.

1.1 Course Web Site Design Guides

The University of Oregon [10] offers an online document that discusses the anatomy of course Web sites and provides a general overview of the content of selected sites. This guide provides tips on design and a simple step-by-step process for creating a course Web site.

Similar publications are available from other universities. Dartmouth College [1] offers a set of articles on

course Web site design as well as an online guide. Important questions about online teaching in general, and course Web sites in particular, are considered from many perspectives. The authors discuss how to create sites, issues of privacy in online classrooms, student online forums, etc. This set of articles is a valuable resource for both novice and advanced course Web site designers.

Patti Shank [9], at the University of Colorado, Denver, has posted a tutorial entitled *How to Build a Course Web Site*. She provides a number of Macromedia Dreamweaver templates and easy-to-follow directions on how to use them to get a site up quickly and painlessly. This tutorial can help an instructor new to this technology get up to speed and put his or her own site together quickly. The introduction provides insight into the importance and versatility of course Web sites and encourages professors to provide them for their courses.

We found similar tutorials on Web sites at the University of Michigan [5], the University of Washington [11], Berkeley University [4], and the Massachusetts Institute of Technology [7]. All of these share several common features, such as a short overview of the typical components of course Web sites, useful templates, and a list of tips and directions for using tools like Macromedia Dreamweaver. Example course Web sites are also available in most cases to enhance understanding and provide ideas for one's own site.

A more extensive tutorial, entitled *Web Style Guide: Basic Design Principles for Creating Web Sites*, is available from Yale University [6]. This guide incorporates a separate chapter dedicated exclusively to course Web sites creation. It is comprehensive and provides detailed examples, templates, and explanations. Lots of options are presented for choosing the type of site a faculty member may want and how to make it most effective for students. The guide also addresses more subtle aspects of Web sites such as readability and ease of use.

1.2 Papers on Course Web Sites

We found very few formal papers that discussed the different aspects of designing course Web sites. Heines [3] analyzed student grades to evaluate the effect of a course Web site on student performance and surveyed students to assess the utility of a site's various components. The study demonstrated that a readily available course Web site "significantly enhanced student's learning of course content." Based on these results, one might conclude that course Web sites can improve overall teaching effectiveness.

Gehringer [2] discussed the issue of password protected access to course Web sites and debated whether or

not such sites should be so restricted. The author conducted a survey of faculty members at several universities and suggested a number of reasons for protecting course Web sites with a password. Gehringer concluded that it is difficult to decide whether to restrict course materials on the Web. On the one hand, public sites can make it impossible for a university to commercialize these sites. On the other hand, restricted sites can make it impossible for prospective students to familiarize themselves with a course of study and thereby aid their decision about attending the university. Perhaps it is best to partially hide information, making general information public but allowing professors considerable discretion in deciding what resources to make available only to current students.

Reeves and Dehoney [8] analyzed the content of class pages and interviewed professors about such content. They weighted the importance of different Web site components and concluded that the outcomes of using course Web sites exceeded expectations seemingly in proportion to the degree to which instructors used the unique qualities of the Web. Collaborative forms of instruction appeared to be one of the strongest points stressed in the interviews.

2 Analysis of Existing Course Web Sites

We also used popular search engines such as *Google* and *Yahoo!* with the keywords "course Web site" and "course Web page" to find over 230 course Web sites. (These links are listed in the on-line version of this paper at http://www.cs.uml.edu/~heines/techrpts/papers/GrankovskaHeines_THEJournal_ online.doc.) These sites were scrutinized on the presence of 16 categories of information, some of which had subcategories (see Table 1).

Our analysis revealed that nearly 100% of the sites (229 out of the 230) have course syllabi that include a course description, grading policy, and instructor and teaching assistant contact information and office hours. This appears to be the minimum content for a course Web site. It allows students to familiarize themselves with the course before enrolling, fostering wiser curriculum choices and better preparation for class. About 87% (201) of the syllabi we viewed post weekly course schedules, while the rest seem to prefer to set only tentative class schedules to allow flexibility for changes and updates as the semester progresses. Although knowing the schedule ahead of time appears desirable, adaptive schedules can more easily take diversity of student interests or the volume of material actually covered in preceding lectures into account.

A majority of sites (178, 77%) post homework assignments and 62% (143) provide online access to lecture notes in HTML, PowerPoint, or PDF formats. Quick and easy access to these components is highly desirable not

only for students who miss class, but also for those who have trouble keeping up and even those interested in delving deeper into subject matter not covered during normal classes. In addition, such components are of great help to foreign students whose language skills impede their understanding of lectures.

We found that the prevailing format for online lecture material is Microsoft PowerPoint. Even though this format is convenient for presentations, its file sizes are typically large, creating problems in downloading if a student has only a slow or unreliable Internet connection. Converting this material to HTML would require additional time, but might make it more accessible.

The vast majority of sites (201, 87%) post links to resources located on other sites that provide additional information to interested and/or advanced students. This useful feature can breach gaps in subject matter understanding and promote creativity and independent thinking.

Table 1. Summary of Web Site Analysis Results. (**N** is out of 230 Web sites examined.)

Information Category	N	%
1. course syllabus with:		
a. grading policy	223	97.0
b. course description	229	99.6
c. weekly schedule of topics	201	87.4
d. instructor and TA contract information	229	99.6
e. schedule of office and/or help hours	229	99.6
2. assignments	178	77.4
3. lecture notes	143	62.2
4. additional documents and/or resources:		
a. class handouts	161	70.0
b. links to resources on this site as well as others	201	87.4
5. FAQ page	16	7.0
6. grade display program	42	18.3
7. interactive lessons	3	1.3
8. sample tests	75	32.6
9. sample student work	69	30.0
10. course BBS	37	16.1
11. class roster containing:		
a. student e-mail addresses	21	9.1
b. student pictures	1	0.4
12. suggestion box (anonymous or not)	12	5.2
13. course announcements	55	23.9
14. course mailing list	10	4.3
15. the site development tool and technique (if discernable):		
a. commercial development tool (as opposed to home grown)	41	17.8
b. team development (as opposed to an individual effort)	14	6.1
16. two-way communication (as opposed to one-way)	59	25.7

We found frequently asked questions (FAQ) pages to be quite rare on course Web sites. Such pages can: (1) replace one-on-one student-instructor meetings, releasing students from trying to catch their instructor during short office hours and cutting down the number of times commuting students need to come to the university, (2) provide a way for students to find answers to their questions before posing them to the instructor in person, hence avoiding multiple questions of same nature from different students, and (3) save class time by referring students to FAQ pages for administrative issues. Questions and answers can be accumulated over the years and evolve into fruitful discussions with useful examples and explanations from different angles.

Only 18% (42) of the sites we visited had grade display programs, and only a handful of those offered password protection to control access to grades on a per student basis. Most simply presented a list of last names and corresponding grades. A grade display program can also indicate a student's relative class standing during the semester. Unfortunately, the source code for sophisticated programs is not readily available, and creation of such a program can require considerable programming skills.

Next we considered the availability of interactive lessons. We found that most professors who teach their courses "live" do not provide the same material online in interactive form. While interactive lessons can be quite useful, their effectiveness is highly sensitive to both learning environment and quality of material presented. For instance, a lack of examples designed to demonstrate a concept can lead to shallow understanding. In general, it takes a great deal of talent, imagination, and understanding of human psychology to create easy-to-use yet informative and helpful online lessons. For example, student-instructor dialogs are an important tool for achieving overall comprehension of a subject. These are usually present in live classrooms, but they can be difficult to duplicate in online classrooms.

Since most courses have tests and exams, advanced information on upcoming tests and/or examples of problems and their solutions or hints appear to be another useful feature of course Web sites. However, some faculty intentionally remove such information at the end of the semester for various reasons. Only 30% (69) of all Web sites we examined provided such information. Sample homework solutions from previous years or solutions to similar problems also fall into this category. Although this component is not a critical one, a considerable number of instructors adhere to the teaching axiom of providing students not only with theoretical knowledge, but also with

solutions to numerous practical problems that demonstrate application of the theories.

As the Internet has evolved, new and advanced features such as interactive forums have appeared and gained wide popularity. Forums support discussion by a group of people and can serve as an information database, even though retrieval of the answer to a specific question may be difficult. Few sites (37, 16%) have this feature. One possible reason for such limited use of these forums may be their initial cost, as relatively few instructors have the time or skill to build their own. Nevertheless, forums provide a great opportunity for students and faculty to continue information and data exchange during non-class hours. They also encourage students to share their knowledge with each other in a convenient form, especially when someone who has a question posts it online and someone else who knows the answer (or where to find it) replies to all who may be interested.

Few sites (21, 9%) post the course roster and students' email addresses and other personal information on Web so that it is available to public. Roster listings can help students get to know each other and lead to more interaction and shared learning. On the other hand, some consider such listings an invasion of students' privacy.

Even fewer sites (12, 5%) have anonymous or non-anonymous suggestion boxes. Suggestion boxes give students a good chance to provide feedback to instructors during the semester. Anonymous suggestion boxes allow shy students to speak out even if they are intimidated by others with more straightforward or bold personalities.

A handful of sites (10, 4%) offer a class mailing list. Such a list can serve as an alternative to a FAQ page by making the instructor's responses to student questions available to the entire class. This way, those not participating in the discussion still see its progress and result. A mailing list can also operate more quickly than a FAQ page. Furthermore, a mailing list is convenient for limiting distribution of information to current students. On the other hand, a FAQ page preserves discussion threads for future students and hence can reduce the stream of questions and answers by letting students search the existing entries.

In most of cases, it is difficult to determine whether a course Web site was created through personal effort of a single instructor or his or her staff (if any), or if it was created using templates provided by the academic department or the university. It is worth mentioning that many universities do provide their faculties with the choice of using standard templates for course Web site development or implementing their own site with any features and options they deem useful.

3 Faculty Survey on Course Web Sites

For the second part of our research we created an online survey, posted it on the Web, and advertised its URL to all subscribers of the ACM SIG CSE list server (approximately 750 people), all University of Massachusetts Lowell faculty (approximately 425 people), as well as approximately 100 other known faculty members in various institutions. 150 people completed the survey, a response rate of approximately 12%. The survey is shown in the on-line version of this paper referenced above. A summary of the results is shown in Table 2.

125 (83.3%) of the faculty who responded to our survey indicated that they have course Web sites, while 25 (16.7%) indicated that they do not. Most (73.6%) of those who have course Web sites have them open to public, allowing their information to be shared over the Internet. 19 (15.2%) have restricted access to their Web sites for various reasons, including the availability of grade displays, answers to quizzes and exams, etc. (See [2] for an in-depth discussion of this issue.)

Of the 25 faculty who do not course Web sites of their own, 17 (68.0%) expressed the desire to have one in the future, while 5 (20.0%) have no such a desire. The reasons provided by the latter group included an unwillingness to spend time creating and maintaining a site and a lack of confidence that such effort would be of significant aid to the students in the courses they teach.

A majority of faculty surveyed (93/150, 62.0%) responded that their institutions have a Web development group to assist them, but only 14 of these 93 (9.3%) indicated that they took advantage of that group's services.

25 of the respondents (16.7%) reported that their institutions have guidelines for constructing course Web sites, while 97 (64.7%) stated that their institutions do not. Such guidelines typically provide faculty with clear ideas for the content, layout, and implementation. This information can help reduce the time needed to create sites and make development efforts more efficient and helpful to students. In addition, well thought out guidelines can make the structure and organization of all course Web sites across a university more consistent.

Faculty reported that they develop an average of 89.1% of course Web site content themselves. They also claimed to have developed an average of 83.9% of the infrastructure themselves. These figures may be interpreted to demonstrate a large need for flexible course Web site templates. Such templates might save faculty considerable time and foster greater consistency. Furthermore, they might simplify students' use and navigation of the sites.

Table 2. Summary of Survey Results.

Data Summary	Yes	%	No	%	No Resp.	%
Total number of respondents	150					
UMass Lowell Faculty	36	24.0				
Faculty from Other Institutions	114	76.0				
Number of respondents [*with* | *without*] course Web sites	125	83.3	25	16.7	0	0.0
Number of respondents with course Web sites that are [*public* | *private*]	92	73.6	19	15.2	14	11.2
Number of respondents without course Web sites who [*would* | *would not*] like one	17	68.0	5	20.0	3	12.0
Number of respondents [*with* | *without*] access to a Web development group	93	62.0	34	22.7	23	15.3
Number of those respondents who [*used* | *did not use*] their development group	14	9.3	79	52.7	0	0.0
Number of respondents whose institutions [*have* | *do not have*] guidelines	25	16.7	97	64.7	28	18.7
Average percent of content developed by respondent him/herself		89.1			0	0.0
Average percent of infrastructure developed by respondent him/herself		83.9			8	6.4
Number who built site using a commercial course Web site tool	20	16.0				
Number who built site using a general purpose Web site development tool	28	22.4				
Number who built site using a locally developed tool	6	4.8				
Number who built site without a development tool	94	75.2				

Number of respondents claiming lack of each of the following as a "serious obstacle to making their course Web site everything they want it to be" or a "significant part of the reason why they do not have a course Web site"

	Total		Have CWS		No CWS	
Time	122	81.3	106	84.8	16	64.0
Know-How	32	21.3	21	16.8	11	44.0
Technical Assistance	25	16.7	17	13.6	8	32.0
Tools	22	14.7	20	16.0	2	8.0
Promotion and Tenure Recognition	18	12.0	17	13.6	1	4.0
Other Factors	18	12.0	10	8.0	8	32.0
Interest	5	3.3	3	2.4	2	8.0
Content Assistance	4	2.7	3	2.4	1	4.0

20 of the 125 faculty who have course Web sites (16.0%) use commercial tools specifically designed for course Web site development such as Blackboard and WebCT. Others provided several reasons why they shied away from such tools, including cost and support. 28 of the 125 (22.4%) use general purpose site development tools

such as Dreamweaver or FrontPage. (There is some overlap in these numbers, i.e., some faculty use both types of tools.) Six (4.8%) used locally developed tools. The majority (94/125, 75.2%) reported that they do not use any development tools at all. The reasons reported for this approach include the lack of access to such tools and a lack of time to learn how to use them.

One of the most telling aspects of our survey was that we asked all respondents, regardless of whether they have course Web sites, to indicate which of a series of factors were "serious obstacles to making their course Web site everything they want it to be" or "a significant part of the reason why they do not have a course Web site." Overwhelmingly (122 of the 150, 81.3%), respondents identified lack of time as the major factor. The second factor was lack of know how (21.3%), followed by a lack of technical assistance (16.7%), and lack of tools (14.7%). Lack of recognition for efforts spent on developing course Web sites by promotion and tenure committees was identified by 12.0% of the respondents, as were "other factors" (also 12.0%). Only 3.3% said they lacked the interest to create a course Web site, and only 2.7% indicated that help with content was a factor.

4 Discussion of Survey Results

Based on our discovery of so many publicly available course Web sites, many college faculty obviously consider such sites an important, helpful aid to their students. We did not find any college or university or department that *required* its faculty to develop course Web sites, but our survey confirmed that many see them as important teaching accessories. The majority of responding professors who did not have course Web sites expressed a ready desire to have one in the near future. Explanations for not having Web sites varied, but a majority cited lack of time, insufficient knowledge of creating Web pages, and sparse technical resources and assistance as the main factors.

The survey also revealed that only a handful of universities provide their faculty with guidelines for creating course Web pages. Among these, Yale University and the University of North Carolina provide some of the most detailed guidelines. Computer services or academic departments of some universities also offer useful templates for course Web site development. However, these templates are typically not available to the general public. Such templates provide a fast track to creating sites for professors who are not familiar with such

techniques: he or she can get started simply by filling out a number of fields and uploading some files specific to his or her subject.

The level of institutional support for creating and maintaining course Web sites varies greatly from strong guidelines and extensive templates to no support at all. As a result, one can find sites that vary from simple pages that present only course descriptions and syllabi to those that list lecture notes, homework assignments, sample tests and exams, solutions to selected problems, elaborate graphical user interfaces, and sophisticated interactive forums to support online student discussions.

Further progress in course Web sites development will emphasize the importance of invoking Internet resources to increase productivity and the effectiveness of instruction. Interactive visual presentations may help students comprehend the subject, get familiar with what is to be taught in future classes, and broaden their knowledge by reading additional materials or analyzing solutions to problems. Interactive discussion forums provide a great opportunity for students to exchange knowledge and help each other advance their understanding.

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Appendix A. Web Sites Visited

1. http://129.101.135.221/if/271/index.html
2. http://6004.lcs.mit.edu/
3. http://ac.stephens.edu/bennett/aimhome.htm
4. http://academic.emporia.edu/hindinit/ac503.html
5. http://aggie-horticulture.tamu.edu/syllabi/308/index.html
6. http://astro.uchicago.edu/classes/physci/119/winter-2002/
7. http://astro.uchicago.edu/classes/physci/120/spring-2001/main.html
8. http://astron.berkeley.edu/~mwhite/teachdir/a250_spr99.html
9. http://bobbyorr.gsia.cmu.edu/macro/
10. http://cat2.mit.edu/arc/4.203/
11. http://cat2.mit.edu/arc/4.204/
12. http://cfa-www.harvard.edu/~sasselov/astro206/course.html
13. http://citd.utsc.utoronto.ca/CHM/B44/Index.htm
14. http://clarkson.edu/~hooperw/MA383/index.html
15. http://classes.cec.wustl.edu/~cs160/
16. http://classes.cec.wustl.edu/~cs241/
17. http://colloid.stfx.ca/chem100/
18. http://faculty.fuqua.duke.edu/~jpayne/ba525.htm
19. http://faculty.uml.edu/adoerr/92.321/
20. http://faculty.uml.edu/dklain/lin2.html
21. http://faculty.uml.edu/klevasseur/courses/92.132/
22. http://faculty.uml.edu/sfessia/36.613/index.htm
23. http://faculty.uml.edu/spennell/92.231/
24. http://galton.uchicago.edu/~amit/
25. http://gober.net/victorian/
26. http://health.uml.edu/32604/
27. http://home.ust.hk/~mnkxin/mgto121.htm
28. http://kccesl.tripod.com/
29. http://lal.cs.byu.edu/cs501/homepage.html
30. http://lawr.ucdavis.edu/classes/atm5/index05.htm
31. http://libWeb.uncc.edu/ref-arts/religion/rels2101.htm
32. http://me.www.ecn.purdue.edu/~me315/
33. http://morse.uml.edu/~kchandra/linearsys.html
34. http://msl1.mit.edu/mib/dsp/curricula.mit.edu/~dsplan/
35. http://online.sfsu.edu/~jperron/ITEC715-1/text.html

36. http://pandonia.canberra.edu.au/OS/OS.html
37. http://people.cs.uchicago.edu/~dupont/courses/cs342-01/index.html
38. http://people.cs.uchicago.edu/~kirby/
39. http://people.cs.uchicago.edu/~simon/CS280/
40. http://people.cs.uchicago.edu/~stuart/Courses//CS-310/
41. http://psych.athabascau.ca/html/387/psyc387ol.htm/
42. http://rabi.phys.virginia.edu/105/home.html
43. http://sbs.cs.olemiss.edu/211spring2002/index.html
44. http://science.widener.edu/~svanbram/chem145/chem145.html
45. http://scis.nova.edu/~mmis/MMIS621/start.html
46. http://students.itec.sfsu.edu/ITEC817/
47. http://teaching.ucdavis.edu/nut10/default.htm
48. http://teaching.ucdavis.edu/nut111/default.htm
49. http://Web.grinnell.edu/courses/ecn/s02/ecn111-03/Index.html
50. http://Web.grinnell.edu/courses/his/s02/his222-01/index.html
51. http://Web.mit.edu/1.149/www/
52. http://Web.mit.edu/10.001/Web/
53. http://Web.mit.edu/10.213/www/
54. http://Web.mit.edu/16.050/
55. http://Web.mit.edu/16.20/www/
56. http://Web.mit.edu/16.230/home.html
57. http://Web.mit.edu/6.041/www/home.html
58. http://Web2.uvcs.uvic.ca/courses/naWeb_2000/
59. http://www.albany.edu/~dkw42/eaps760.html
60. http://www.albany.edu/acc/gangolly/a681s93s.html
61. http://www.albion.edu/math/DMason/math360/index.html
62. http://www.albion.edu/math/mokennon/219s99.htm
63. http://www.bgsu.edu/departments/tcom/451.html
64. http://www.bio.cmu.edu/Courses/03740/
65. http://www.brookdale.cc.nj.us/fac/writing/jcody/e122/framenx.html
66. http://www.bsu.edu/classes/ribblett/chem100/index.html
67. http://www.bsu.edu/classes/storhoff/112_02/
68. http://www.cee.umd.edu/stud/encecourlst/PAGE199.html#ITEMID594ENCE_425_Decision_Analysis_for_Engineering
69. http://www.cellbio.drake.edu/Exobio/ExobioHome.html
70. http://www.chem.ucalgary.ca/courses/350/
71. http://www.cis.upenn.edu/~jpo/Courses/MEAM410/
72. http://www.clarkson.edu/%7Eclynch/cs141/spring02/syllabus.html
73. http://www.clarkson.edu/%7Edempsey/MA231/Fall01/MA231.htm
74. http://www.clarkson.edu/%7Edempsey/MA578/Spring02/MA578.htm
75. http://www.clarkson.edu/~jnm/cs644/
76. http://www.clarkson.edu/~macewen/math132/
77. http://www.clarkson.edu/~pschultz/ma232/
78. http://www.clarkson.edu/class/ma339/index.html
79. http://www.clas.ufl.edu/users/lgravlee/ang6930/index.htm
80. http://www.classes.cs.uchicago.edu/classes/archive/2001/fall/CS115-02/
81. http://www.classes.cs.uchicago.edu/classes/archive/2001/fall/CS221/
82. http://www.coastal.edu/wcb/schools/BUS/bus/swathen/11/
83. http://www.coastal.edu/wcb/schools/SC/cs/ecollins/16/
84. http://www.coastal.edu/wcb/schools/SC/cs/fmccusk/19/
85. http://www.coe.ilstu.edu/rpriegle/eaf428/syllabus.htm
86. http://www.courses.fas.harvard.edu/~es100hf/
87. http://www.courses.fas.harvard.edu/~es156/
88. http://www.courses.fas.harvard.edu/~es162/
89. http://www.courses.fas.harvard.edu/~es205/
90. http://www.courses.fas.harvard.edu/~es51/
91. http://www.courses.fas.harvard.edu/~es6/
92. http://www.cs.colorado.edu/~clayton/Syl1300.html

93. http://www.cs.colorado.edu/~diwan/3155-02/
94. http://www.cs.colorado.edu/~hal/CS3104/home.html
95. http://www.cs.colorado.edu/~rick/Classes/3287/
96. http://www.cs.colorado.edu/~zbergen/cs1300/index.html
97. http://www.cs.cornell.edu/courses/cs432/2001fa/
98. http://www.cs.cornell.edu/Courses/cs478/2000SP/
99. http://www.cs.cornell.edu/Courses/cs486/2001SP/
100. http://www.cs.indiana.edu/classes/c304/oop-intro.html
101. http://www.cs.jhu.edu/~salzberg/cs439.html
102. http://www.cs.montana.edu/~starkey/254.html
103. http://www.cs.orst.edu/~cs582/
104. http://www.cs.toronto.edu/~darrell/csc108f/index.html
105. http://www.cs.uml.edu/~bill/cs308/
106. http://www.cs.uml.edu/~canning/91101.htm
107. http://www.cs.uml.edu/~giam/
108. http://www.cs.uml.edu/~grinstei/91.101/
109. http://www.cs.uml.edu/~gumb/courses/330.html
110. http://www.cs.uml.edu/~haim/
111. http://www.cs.uml.edu/~heines/index.htm
112. http://www.cs.uml.edu/~holly/91.450/
113. http://www.cs.uml.edu/~john/115syl.html#top
114. http://www.cs.uml.edu/~kajal/courses/91.201-F01/index.html
115. http://www.cs.uml.edu/~kdaniels/courses/ALG_404.html
116. http://www.cs.uml.edu/~kdaniels/courses/ALG_503.html
117. http://www.cs.uml.edu/~lechner/01f522/01f522syllabus.htm
118. http://www.cs.uml.edu/~tom/413/413.html
119. http://www.cs.uml.edu/~wang/cs502/
120. http://www.cs.uml.edu/~williams/courses/DPL/SyllabusS01.html
121. http://www.cs.waikato.ac.nz/~312/
122. http://www.cs.wustl.edu/~sck/101/current-semester/
123. http://www.cs.yale.edu/homes/carsten/classes/s02/index.html
124. http://www.cs.yorku.ca/course_archive/2000-01/F/1030/
125. http://www.csdl.tamu.edu/FLORA/tfp/tfphome1.html
126. http://www.cse.ucsc.edu/~elm/Classes/12b/w02/
127. http://www.cse.ucsc.edu/~pohl/12A/
128. http://www.cse.ucsc.edu/classes/cmpe012c/Winter02/
129. http://www.cse.ucsc.edu/classes/cmpe080n/Winter02/
130. http://www.cse.ucsc.edu/classes/cmps010/Fall01/
131. http://www.cse.ucsc.edu/classes/cmps058/Winter02/
132. http://www.cse.ucsc.edu/classes/cmps080c/Winter02/
133. http://www.deas.harvard.edu/courses/cs182/
134. http://www.deas.harvard.edu/courses/es154/
135. http://www.december.com/john/teach/cmc/rpi94/
136. http://www.devry-phx.edu/fac/wyman/cis160/
137. http://www.doe.carleton.ca/~walkey/398/index.htm
138. http://www.econ.ucsb.edu/~owen/econ139/139home.html
139. http://www.ee.bilkent.edu.tr/%7EeeWeb/ge401/
140. http://www.ee.bilkent.edu.tr/~eeWeb/ee202/home.html
141. http://www.ee.bilkent.edu.tr/~eeWeb/ee212/home.html
142. http://www.ee.bilkent.edu.tr/~eeWeb/ee302/home.html
143. http://www.ee.bilkent.edu.tr/~eeWeb/eee101/home.html
144. http://www.ee.bilkent.edu.tr/~eeWeb/math204/home.html
145. http://www.ee.bilkent.edu.tr/~math250/
146. http://www.ee.bilkent.edu.tr/~oarikan/math220.html
147. http://www.ee.bilkent.edu.tr/ee428/index.html
148. http://www.ee.bilkent.edu.tr/ee447.html
149. http://www.eecs.harvard.edu/cs143/index.html

150. http://www.eli.sdsu.edu/courses/spring98/cs635/
151. http://www.eng.auburn.edu/~jvalenz/insy4800/hh.html
152. http://www.eng.auburn.edu/~maghsood/homepage.html
153. http://www.eng.auburn.edu/department/ie/courses/insy3420/
154. http://www.eng.auburn.edu/department/ie/courses/insy7420/
155. http://www.eng.auburn.edu/department/ie/courses/projmgt/
156. http://www.eng.buffalo.edu/~etemadi/morespace/ee312/index.html
157. http://www.eng.buffalo.edu/Departments/eas/Classes/eas230/
158. http://www.eng.buffalo.edu/Departments/eas/Classes/eas305/
159. http://www.eng.fsu.edu/~ecollins/dynamics/
160. http://www.eng.uml.edu/~ECE/Faculty/Cheney/Spring2002/16565/index.htm
161. http://www.eng.uml.edu/~ECE/Faculty/kprobs01.html
162. http://www.eng.uml.edu/~ECE/Faculty/Rome/comther.htm
163. http://www.etsu.edu/physics/bsmith/fall01/astro1_fall01.html
164. http://www.fas.harvard.edu/~libcse10/
165. http://www.gardner-Webb.edu/GWU/NaturalSci/physics/phy104/phy104.htm
166. http://www.infocom.cqu.edu.au/Courses/aut2001/00203/site/index.html
167. http://www.infocom.cqu.edu.au/Courses/aut2001/21564/
168. http://www.inform.umd.edu/EdRes/Colleges/ARHU/Depts/ArtHistory/courses/ARTH275/FA01/
169. http://www.la.utexas.edu/course-materials/philosophy/bonevac/302/302F2001.html
170. http://www.lasalle.edu/~mali1/DART102/index.html
171. http://www.latech.edu/~hhegab/pages/engr222/index.htm
172. http://www.leitner.org/courses/scis/cisd770-9902.html
173. http://www.math.dartmouth.edu/~m1f01/
174. http://www.math.mcmaster.ca/~m1a3/1d6/1d6.html
175. http://www.math.toronto.edu/~spencer/mat334/outline.html
176. http://www.mcs.vuw.ac.nz/comp/Courses/305/tmp1999/
177. http://www.mscd.edu/~cmsdept/cms3220/01s/Welcome.html
178. http://www.mstm.okstate.edu/students/DCastellon/IT-SUL/TNCourse/Course.html
179. http://www.nevada.edu/~strudler/767.html
180. http://www.orie.cornell.edu/~eva/or630/or630.html
181. http://www.orie.cornell.edu/~or633/
182. http://www.osu.orst.edu/instruct/me317/costello/
183. http://www.people.vcu.edu/~lsstratt/econ205.html
184. http://www.ralphphillips.com/scc/cet1515c/
185. http://www.raritanval.edu/departments/cis/internet_course_outlines.html
186. http://www.roswellpark.org/gradeducation/o4s/Default.htm
187. http://www.sba.oakland.edu/SBAdocs/Webcrse/Web_overview.htm
188. http://www.science.widener.edu/~grant/courses/bio101.html
189. http://www.science.widener.edu/~weaver/Bio219.htm
190. http://www.scis.nova.edu/~murraymg/
191. http://www.scs.carleton.ca/~courses/101/
192. http://www.sinclair.edu/sec/law101/home.htm
193. http://www.smi.stanford.edu/projects/helix/bmi214/
194. http://www.swiss.ai.mit.edu/6095/
195. http://www.theory.caltech.edu/people/preskill/ph229/
196. http://www.uml.edu/Dept/AC/FinAcct.html
197. http://www.uml.edu/Dept/Chem/aangelop/pchem2.htm
198. http://www.uml.edu/Dept/English/Archibald/293_01_index.htm
199. http://www.uml.edu/Dept/History/ (Carlsmith)
200. http://www.uml.edu/dept/math/courses/calculus/92.131/spring02/
201. http://www.uml.edu/Dept/Math/courses/m509.html
202. http://www.uml.edu/dept/math/faculty_personal/sherlock/ruskai/www/calculus.htm
203. http://www.utexas.edu/cola/depts/philosophy/faculty/asher/course/phl358/phl358.htm
204. http://www.utexas.edu/cola/depts/philosophy/faculty/bonevac/313k.htm
205. http://www.utexas.edu/cola/depts/philosophy/faculty/martinich/language.htm
206. http://www.utexas.edu/courses/phl303/index.html

207. http://www.utexas.edu/depts/german/gustafsson/courses/index.html
208. http://www.utsc.utoronto.ca/~asta03/
209. http://www.utsc.utoronto.ca/~burton/B15/
210. http://www.utsc.utoronto.ca/~mendel/a58.html
211. http://www.utsc.utoronto.ca/~murray/BGYC13/
212. http://www.utsc.utoronto.ca/~parkinson/Courses/2001-02/Spring2002/Ecmc49/ECMc49.html
213. http://www.utsc.utoronto.ca/~riggs/BGYB10Y/intro.html
214. http://www.wcbcourses.com/wcb/schools/LEXIS/99law09/fmiller/3/
215. http://www.wiredprof.com/cawriters/
216. http://www2.austin.cc.tx.us/ddydek/index.html
217. http://www3.uakron.edu/econ/e244/
218. http://www-cs101.ai.mit.edu/
219. http://www-csl.cs.colorado.edu/LegoRobots/
220. http://www-ee.eng.buffalo.edu/courses/ee419/index.html
221. http://www-ee.eng.buffalo.edu/faculty/paololiu/353/index.html
222. http://www-ee.eng.buffalo.edu/faculty/stella_batalama/ece483_syllabus.html
223. http://www-ist.massey.ac.nz/~crjessho/comp_arch/
224. http://www-math.mit.edu/~edelman/18.337/
225. http://www-net.cs.yale.edu/classes/cs433/
226. http://zebu.uoregon.edu/~js/ast121/
227. http://zeta.albion.edu/~dreimann/Spring2000/courses/cs256/index.html
228. http://zoo.cs.yale.edu/classes/cs110/
229. http://zoo.cs.yale.edu/classes/cs365/
230. http://zoo.cs.yale.edu/classes/cs475/2002/index.html

Appendix B. Course Web Site Development Survey

Welcome Page Seen by All Respondents

Univ. of Massachusetts Lowell

Department of Computer Science

Course Web Site Development Survey

Thank you for taking the time to complete our small survey.

There are only two sections to this survey, the question on this page and different sets of questions for people who do have course Web sites and those who do not. We hope that you can complete the entire survey in 5-10 minutes.

— *Jesse Heines* and *Svitlana Grankovska*, UMass Lowell Computer Science

The following information is optional.

However, if you would like to us to notify you when the results of our survey are available, we will need your e-mail address.

Your Name:

Your Institution:

Your Department:

Your Title: Teaching Asst. Instructor Asst. Prof. Assoc. Prof. Professor

Additional Title: Chair Dean Provost Other

Do you have tenure? Yes No

Your E-Mail Address:

Please notify me when results are available. Yes No

Here is our first real question:

Do you have a course Web site for one or more of the courses you teach?

Yes No

<< Quit Go On >>

Question Page Seen by Respondents Who Indicated That They Have Course Web Sites

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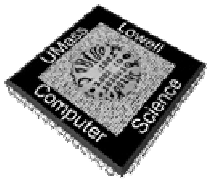
Univ. of Massachusetts Lowell

Department of Computer Science



Course Web Site Development Survey

Section A: For respondents who have course Web sites...

1. Is (or are) your course Web site(s) publicly available on the Internet?
   ☐ Yes ☐ No
   a. If yes, what are some of their URLs?
      Course 1 _____
      Course 2 _____
      Course 3 _____

2. Does your institution have an office or group whose responsibility includes helping professors develop course Web sites?
   ☐ Yes ☐ No
   a. If yes, did you use their services in developing your course Web site(s)?
      ☐ Yes ☐ No

3. Does your institution have guidelines or standards for course Web site design and/or development?
   ☐ Yes ☐ No

4. Is your site built with a commercial course Web site development tool (like Blackboard or WebCT)?
   ☐ Yes ☐ No
   a. If so, which one? _____
   b. If not, did you use a locally-developed course Web site development tool or did you build the basic site yourself? ☐ used local tool ☐ self-built
   c. If self-built, did you use a general-purpose site building tool like FrontPage or Dreamweaver or InterDev? ☐ Yes ☐ No
   d. If so, which one? _____

5. Approximately what percent of your course Web site's ***infrastructure*** (basic page templates, navigation controls, etc.) did you develop yourself and what percent was developed by others (TAs, RAs, students, support personnel, etc.)?

   infrastructure developed by self: [ ] %

   infrastructure developed by others: [ ] %

6. Approximately what percent of your course Web site's ***content*** (subject matter text and links) did you develop yourself and what percent was developed by others?

   content developed by self: [ ] % **content** developed by others: [ ] %

7. What types of things would you like to have on your course Web site that you have been unable to develop or obtain?

   [ ]

8. Which of the following do you consider to be serious obstacles to making your course Web site everything you want it to be?

   - ☐ lack of time
   - ☐ lack of interest
   - ☐ lack of know-how
   - ☐ lack of technical (programming) assistance
   - ☐ lack of content (subject matter) assistance
   - ☐ lack of appropriate tools
   - ☐ lack of recognition of efforts by promotion & tenure committee

   Other: [ ]

9. Please provide us with any additional comments you would like to make on the development of your course Web site.

   [ ]

That's all! Thank you sincerely for your time.

<< Restart Finish >>

Question Page Seen by Respondents Who Indicated That They Do Not Have Course Web Sites

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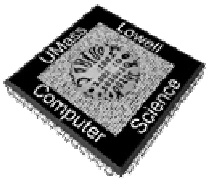
Univ. of Massachusetts Lowell

Department of Computer Science



Course Web Site Development Survey

Section B: For respondents who do not have course Web sites...

1. Would you like to have a course Web site? ○ Yes ○ No

2. If so, which of the following are significant parts of the reason why you do not have a course Web site?
   - ☐ lack of time
   - ☐ lack of interest
   - ☐ lack of know-how
   - ☐ lack of technical (programming) assistance
   - ☐ lack of content (subject matter) assistance
   - ☐ lack of appropriate tools
   - ☐ lack of recognition of efforts by promotion & tenure committee

   Other: _____

3. Please provide us with any additional comments you would like to make on the development of course Web sites.

That's all! Thank you sincerely for your time.

<< Restart Finish >>