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Development of a World Wide Web Site for the Occupational Safety and Environment Health Program in the Industrial Technology Department at the University of North Dakota

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Development of a World Wide Web Site for the Occupational Safety and Environment Health Program in the Industrial Technology Department at the University of North Dakota

by

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This Independent Study, submitted by Zachary David Knoop in partial fulfillment of the requirements of the Degree of Master of Science, Industrial Technology, from the University of North Dakota, has been read by the Faculty Advisory Committee under whom the work has been done and is hereby approved.

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Signature Zachary D. Knaup

Date 5/9/00

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CHAPTER I: INTRODUCTION

In the late 18th century, the Industrial Revolution brought about radical socioeconomic changes, changes that affected almost all aspects of life. It was a revolution that once underway there was no way of stopping its progress. Today we are going through a communications revolution. Many new technological inventions can be attributed to this communications revolution, but the one that is probably the single most important is the technological invention of the Internet.

The invention of the Internet, and eventually the World Wide Web, has led to large-scale changes in our society. It has affected almost every aspect of society, much like the Industrial Revolution did. The most noticeable effect the Internet and World Wide Web have had is how it has changed our ability to communicate and share information. The Internet allows us to communicate with people around the world, regardless of geographic location. The World Wide Web has been called the Gutenberg press of our time, giving practically anyone the ability to publish information on the Web (Castro, 1998, p. 13). Even though the Internet and World Wide Web are rather new technologies, they have already made their mark on history.

Statement of Need

With more and more people, businesses, academic institutions, etc., using the World Wide Web for gathering and sharing information, it is no longer considered unique to have a Web site, but more or less a requirement. The number of World Wide Web users is increasing every day. Developing a World Wide Web site for the Occupational Safety and Environmental Health program will expose the program, as well as the Industrial Technology Department and the University of North Dakota to potentially millions of Web users.

Statement of Problem

The purpose of this study was to develop a World Wide Web site for the Occupational Safety and Environmental Health Program in the Industrial Technology Department.

Objectives

The objectives of this study were to:

- Develop a web site for Occupational Safety and Environmental Health students that can be used as a tool for research, job searching, and accessing other pertinent information related to the program.
- Develop a web site to gain interest and recruit new students throughout the world to the Occupational Safety and Environmental Health Program at the University of North Dakota.

- Design a web site that can be used as a template for other university academic programs setting up similar sites.
- Design a web site that is user friendly to navigate through.
- Design a web site that is user friendly for updating and revision by future webmasters.

Assumptions

Due to the popularity of the Internet and the World Wide Web, it is assumed that the majority of persons reading this study will have a basic understanding of the Internet and World Wide Web.

Limitations

This study will be limited to the Occupational Safety and Environmental Health Program within the Industrial Technology Department of the University of North Dakota.

Definition of Terms

Browser: Software that enables web pages to be viewed, i.e., Netscape, Microsoft Internet Explorer.

Client: The computer that is accessing information or connecting to a host computer or server.

Host: A computer that is assigned an Internet address and provides a variety of services, including Internet access, for people who connect to the host

from their desktop computers (Blurton, 1994, p. 193). Computers that distribute data over the Internet. Also called a server.

HTML: Hypertext Markup Language; language used to format text, add rules, graphics, sound, and video and save it all in a text-only ASCII file that any computer can read (Castro, 1998, p. 14). The language used for composition of web pages.

Internet: A network of computer networks that understand the same language for transferring data (NDSU [What is the Internet?], 2000, paragraph 7).

ISP: Internet Service Provider; companies dedicated to providing Internet access and services (NDSU [Getting Connected to the Internet], 2000, paragraph 4)

Modem: Hardware that allows digital data to be transmitted between computers over phone lines (NDSU [Getting Connected to the Internet], 2000, paragraph 6)

OSEH: Occupational Safety and Environmental Health

TCP/IP: Transmission Control Protocol/Internet Protocol; a universal language of sorts that makes it possible to send information between computers regardless of their location or computer platform (NDSU [Internet Protocols], 2000, paragraph 1).

URL: Uniform Resource Locator; the address of each web site.

WWW: World Wide Web or W3; a graphical, user-friendly portion of the Internet that has decided upon a standard structure and protocol for

graphics, sound, and text files; enabling anyone on the WWW to view web pages regardless of their platform: PC, Mac, workstation, Unix, etc. (NHEWPC, 1996, paragraph 1).

Summary

The goal of this study was to develop a World Wide Web site for the Occupational Safety and Environmental Health Program within the Industrial Technology Department. The study focused on identifying the needs of current Occupational Safety and Environmental Health Program students, potential and future recruits; creating a useable template for others; and making the web site user friendly for both visitors of the site and future webmasters of the web site. The Occupational Safety and Environmental Health Program was selected for this study based on the facts that there was not a web site specific to the needs of students and to gain greater exposure for the program.

CHAPTER II: REVIEW OF RELATED LITERATURE

Introduction

The hottest growing part of the Internet that everyone is talking about is the World Wide Web. "With all the publicity and focus it has been receiving, you could be forgiven for thinking that the World Wide Web is the Internet. Actually the Web is just one service available via the international network of computers known as the Internet alongside email, newsgroups and other less well-known Internet services" (Connect.com.au, 1999, paragraph 1).

The World Wide Web has become a major force in our society, and the so-called "Internet World" that we live in. It is changing the way individuals research, shop, entertain themselves, and do their personal financing. It is changing the way businesses operate and is causing educators "to rethink the very nature of teaching, learning, and schooling" (Owston, 1997, p. 27). Provided in this chapter is an overview of the history of the Internet and World Wide Web, the World Wide Web today, how the World Wide Web is used in higher education, the fundamental elements of site design, and the process of developing a web site. To better understand this "Internet World" and the World Wide Web, a review of its past is necessary.

World Wide Web History

It seems like the Internet has only been around for eight or ten years, but its origins actually date back to 1969. The Internet has a wartime past, similar to almost all of our technologies today (Kazmierczak [Background], 1997, paragraph 3), grown from a Cold War concept. The Department of Defense wanted a network of computers which would allow them to continue to communicate even if partially damaged (Kazmierczak [Background], 1998, paragraph 3). In 1969 an experimental network was set up called ARPANET (Advanced Research Projects Agency Network). The original ARPANET network consisted of four nodes (host computers) that were located at UCLA, Stanford, University of California Santa Barbara, and the University of Utah (Zakon, 2000, p. 2). The first packet of information was sent from UCLA to Stanford, which consisted of sending the letters LOGIN, but the system crashed as the letter G was entered (Zakon, 2000, p. 3)

By 1971, ARPANET consisted of 15 nodes, and in 1973 ARPANET made its first international connection to England and Norway (NDSU [How did the Internet Begin?], 2000, paragraph 3). E-mails were being sent starting in 1971, but there were network connection problems. Between 1973 through1978 researchers, led by Vinton Cerf and Robert Kahn, developed TCP/IP (Transmission Control Protocol and Internet Protocol), which solved the network connection problems. "TCP/IP is a universal language of sorts that makes it possible to send information between computers regardless of their location or computer platform" (NDSU [Internet Protocols], 2000, paragraph 1), such as Macintosh or Windows-based. Vinton Cerf has been labeled the "Father of the Internet"

the WWW in 1994, along with the ability to order a pizza from the Hut online. In 1995 the NSF Network was retired and replaced by Internet Service Providers (ISP). By 1996 there were nearly ten million hosts online and the Internet had global coverage (PBS, p. 4).

The time period between 1996 and today was characterized by enormous growth, commercialization, and popularization. Web browsers Netscape and Internet Explorer and the programming language Java were released by 1996. Zakon (2000) has compiled several statistical categories showing the growth of the Internet. Data from July 1999 shows that there were close to 60 million hosts (servers) (p. 22). In March of 1997 there were just under one million WWW servers and in December of 1999 there were over 12 million WWW servers (p. 24).

The year 1998 brought the famous "browser war" between Microsoft's Internet Explorer and Netscape Communication's Navigator browser. Microsoft was accused of violating antitrust laws. The end result is yet to be determined.

World Wide Web Today

The World Wide Web today can be described as dynamic. Not a day passes by without a new web-related technology being released or news on issues concerning the web being discussed in the media. The issues concerning the World Wide Web are numerous. There are social issues on the content of the web. There is no real censorship of the web, resulting in a wide variety of inappropriate material, such as pornography. The issue of security is becoming more and more of a concern to businesses, government,

academic institutions, and to the general public. Amit Yoran, president of an Internet security firm, on describing some hacker attacks on major Internet companies such as Amazon.com and Yahoo.com, says that "What we saw last week was a minor tremor. This is just a small foreshadowing of the real dangers to come" (Burke, 2000, paragraph 12).

With the creation of handheld computers, like the PalmPilot and the Visor, and the advances in wireless communication, the World Wide Web can be accessed virtually anywhere. Sitting in front of a desktop computer and surfing the Web may become a thing of the past, replaced by handheld computers that fit in a shirt pocket and can be used anywhere. Truly global information and global access at a person's fingertips.

The World Wide Web and Higher Education

Introduction

"Nothing before has captured the imagination and interest of educators simultaneously around the globe more than the World Wide Web. The Web is now causing educators, from pre-school to graduate school, to re-think the very nature of teaching, learning, and schooling" (Owsten, 1997, p. 27) The WWW provides both the student and instructor unique opportunities to learn and teach, respectively. Lynn Ward (1998), Assistant Director of UI-OnLine at the University of Illinois, listed 11 different ways the Internet/Web is used in higher education:

1. On-line reference materials;
2. On-line lecture notes with links to related materials;

3. Computer-graded homework assignments;
4. Interactive simulations;
5. Access to remote instrumentations;
6. Facilitate discussion outside or in lieu of the classroom;
7. Facilitate teamwork and active learning;
8. Discussion software and e-mail used to turn in assignments;
9. Access to large databases;
10. Access to remote subject-matter experts, and;
11. Access to images, audio, and video to bring content to life (Slide 38).

There are numerous benefits to using the WWW in higher education, such as those pointed out by Lynn Ward. Some of these benefits will be discussed in further detail in the subsections on how the WWW makes learning more accessible and how it improves learning. Monetary costs associated with using the Web, and some concerns that the use of the Web for teaching and learning brings to higher education will also be discussed.

Making Learning More Accessible

Distance learning is nothing new for colleges and universities. Through correspondence, print instructional materials, audio and video cassettes, and television; colleges and universities have provided opportunities to students unable to attend campus. Web based technology has now provided educators with a new tool to use for distance learning, with many advantages over the traditional methods. "An inviting, graphical screen layout, interactive multimedia learning materials, simplified access and

instructor to promote improved learning" (Owston, 1997, p. 29). These three advantages are that the Web appeals to student's learning mode, provides for flexible learning, and enables new kinds of learning.

Today's generation of students are very familiar with the Internet and World Wide Web. Almost all students in public schools today do not know a world without computers and relate to them in ways that most adults do not. Computers and the Web are as normal in their lives as the television. Owston (1997) goes on to explain that today's students "tend to be more visual learners than previous generations because their world is rich in visual stimuli" (p. 29). It only makes sense then that the Web is being used more and more as a tool to aid in the learning process.

The flexibility the Web allows for learning is enormous. As mentioned previously in the discussion on making learning more accessible, the Web can help students gain an education without being on campus. Instructors are also allowing their full-time, regular, on-campus students more flexibility. Instructors can post assignments, lecture notes, discussion questions, and learning activities on the Web, which can be accessed by the students at their convenience. Students can turn in assignments via e-mail and discussion sessions can be initiated by e-mail also.

When it comes to critical thinking, problem solving, written communication, and the ability to work collaboratively, the Web allows students to develop these skills in unique ways. Whenever students research information on the Web they have to "weigh evidence, judge the authenticity of data, compare different viewpoints on issues, analyze and synthesize diverse sources of information, and construct their own understanding of

the topic or issue at hand" (Owston, 1997. p. 31). This will help students develop critical thinking and problem solving skills. Written communication skills can be developed by writing to authentic audiences, instead of just to the teacher. Students writing to professors from other universities or to corporations will be more aware of their grammar, syntax, and vocabulary (Owston, 1997, p. 31). The Web provides for excellent opportunities in developing collaborative skills. Group projects can be developed where students have to work together through the Web and e-mail to solve a problem or reach a common goal. The geographic location of the students is not important.

Costs of the Web

The costs that universities and colleges incur to maintain their web based technology can be quite high. According to Owston (1997), there are three main areas of cost in web based technology: hardware and software, course development, and on-going course support (p. 31). Hardware and software costs include the Internet connection, modems, ethernet cards, Web editor software, and other software and hardware necessary for video and audio development. Course development costs are often hidden, since faculty usually develop the web courses, spending enormous amounts of time doing so. The maintenance and updating of a web site is an on-going process that has costs associated with it. Justifying these costs and determining what role web technology will play in the education process is left up to the individual institutions and is based on their mission.

Concerns of Using the World Wide Web in Higher Education

The World Wide Web does aid in the learning process and has numerous positive benefits, such as breaking barriers in distance and providing unique learning experiences, but there are also some concerns. Some of these concerns are technological malfunctions, lack of censorship, no systematic information system, and the use of the Web in cheating.

The very technology that is the backbone of creating the Web experience can also cause major headaches. Malfunctions in computer hardware can cause a server to be down for hours and difficulty in setting up software to access information can be a problem. Students dialing in from off-campus many times receive busy signals, due to a lack of sufficient dial-ups at the institution. Once connected, many times the traffic will be very heavy to popular sites, causing very slow responses. These kinds of problems can undermine the on-line educational experience and need to be addressed by the educational institution through ample technical support.

The lack of censorship of the Web is a concern for some. Although most of the information found on the Web is of value, there is also an enormous amount of inappropriate material. Pornography web sites and hate group web sites, to name a few, can be viewed by anyone. Filters used to eliminate these sites from being viewed are not always successful. It is hoped that by the time students get to college they know what is appropriate and what is not appropriate.

When searching for information, many students and educators have a difficult time locating information on the Web. "At present there is no systematic information system–much like a major city with everyone having a telephone number, but no one

having a telephone book or directory assistance" (Flake, 1996, p. 5). This is slowly improving though. With sites like www.altavista.com, www.metacrawler.com, and www.yahoo.com, it is becoming easier to locate relevant information.

The popularity of the Web on colleges and universities is resulting in an increase of electronic plagiarism. "Many teachers who work in 'wired schools' are complaining that new technologies have made it all too easy for students to gather the ideas of others and present them as their own" (McKenzie, 1998, paragraph 3). Students have the capability to find information relevant to their topic of study on the Web, copy it, and then paste it into their paper as their own. This is putting an added burden upon educators to determine if the content of their students is original or plagiarized. It also does not help that there are web sites that offer term papers and theses to students willing to pay. To combat this growing problem, some educators have developed software to identify plagiarism in their courses.

Beneficial or Not?

The "WWW holds the potential of providing a very open approach to education where students no longer are dependent upon their teacher or a textbook as their sole source of information" (Flake, 1996, p. 6). The use of web technology has come a long way in being able to provide an education to almost anyone in the world. It has provided students with new and unique ways of learning. Despite all the benefits, there are still some issues that need to be considered, such as the cost of setting up and maintaining web technology, along with the issues of no censorship, lack of a systematic information

system, and cheating. Overall, the Web is beneficial for educators and students, "the Web can help us re-focus our institutions from teaching to learning, from teacher to student" (Owston, 1997, p. 27).

Principles of Web Design

The primary concern of designing a web site is that it be understandable by any computer, not that it be beautiful. "It is important to realize that each person who looks at your page may see it in a different way, according to the kind of computer system they have, the browser they have chosen, the graphics capacity they have, the speed of their modem and connection to the Web, and the settings they have chosen for their browser" (Castro, 1998, p. 16). It is quite evident that there are several factors that effect what visitors see when viewing a web page. To make a web site appealing and useful to all intended visitors, there are several principles that should be followed when designing a web site. The following eight principles of web design seem to be consistent with most authors of web design literature.

Principle 1: Have something to say. "The guiding principle before creating any web page should be that it needs to have some content, in other words it needs to provide something that someone somewhere is going to find useful or interesting" (Cornish-Bowden, 2000, p. 1).

Principle 2: Keep it simple and consistent. Don't overwhelm your visitors with options. "Less is more" in web design (Indiana University, 1996. paragraph 3). Text should be kept short and to the point. For consistency, "build in predictability and

structure, with clear functional and graphic continuity between various components and subsections" (Indiana University, 1996, paragraph 5). A web site that maintains a consistent style provides a significant visual cue to let people know they are still at the same site (CNET [Style Guide], 2000, paragraph 1).

Principle 3: Make it accessible. Visitors to web sites may be using Macs, PCs, Unix boxes, or other types of machines. They may be using one of several different browsers available to view web pages. According to CNET Builder.com ([Audience], 2000) there are more than 60 browsers available (paragraph 2). Some browsers do not support images. Alternate text should be offered on all images. This also enables people that have sight impairments and use speech synthesizers to recognize images. To make a web site accessible to the largest possible audience, the web site should be tested on different browsers and computers.

Principle 4: Pay attention to loading times. When a web page takes a long time to load, the user will usually lose interest and leave the site. Long loading times are usually associated with Web pages that have too many images or very large images. Be aware of the file sizes of the images used. To speed up download time, keep image sizes small and compress the images (Castro, 1998, p. 58).

Principle 5: Do not assume the user has a huge monitor. Not everyone has a 21 inch monitor. Web pages designed at a width of about 550 pixels will be acceptable for most users (Cornish-Bowden, 2000, p. 6).

Principle 6: Do not use blinking text. Blinking text can be very irritating to viewers and should not be used.

Principle 7: Do not describe your site as "under construction." Web sites that are actively maintained are always under construction. Many web pages will have little images that state the page is under construction. These are usually irritating to the user.

Principle 8: Take care in using "New!" labels. When a web site is actively maintained and updated frequently with new information, the use of "NEW!" images can be useful. These labels, however, "should not have a lifetime of no more than a few weeks" (Cornish-Bowden, 2000, p. 6).

Summary

Before the dawning of the new millennium, many television programs picked the greatest invention of the millennium. The Gutenberg press was picked by several of these television programs. The invention of the Gutenberg press affected the whole world. Now a new technology is being called the "Gutenberg press of our time" (Castro, 1998, p. 13). This new technology is the World Wide Web. Even though its origins only date back to the 1960's, the World Wide Web has had enormous and unexpected effects on every aspect of society through the world.

The WWW is just one component of a much larger network called the Internet. Growing out of the Internet in the early 1990's, the WWW has continued to get bigger and bigger. Today it has intertwined its way into almost all aspects of society. In higher education, the WWW has allowed both students and teachers unique opportunities to learn and teach, respectively. Not all aspects of the WWW have been positive though. There are many social issues on the content of the WWW, as well as security issues.

Despite any negatives of the WWW, as a new generation grows up as accustomed to the WWW as they are to talking on the phone, life on the WWW will become an increasingly important part of life on Earth.

CHAPTER III: METHODOLOGY

This study consisted of the research phase and the development phase. The research phase was the initial phase, consisting of needs analysis, gathering information, and organizing the information. The development phase consisted of designing and publishing the web site. The result of the research and development phases was the creation of the Occupational Safety and Environmental Health (OSEH) Program Web Site.

Research Phase

The needs analysis was done by observing students in the OSEH Program and through conversations with the OSEH Program Coordinator. It was determined that students in the OSEH Program would benefit from having a web site that was specific to their needs, something they had lacked. It was also determined that such a web site could be a powerful tool in recruiting students throughout the world, giving the OSEH Program at the University of North Dakota global exposure.

With the main need determined, the components necessary to make the web site functional for users was included. These components included a career center, safety associations, degree information, links to safety and health web sites, department events, and how to contact the department.

A majority of the data used on the web site was collected from the University of North Dakota's 1999-2001 Academic Catalog. Information on safety associations was obtained from the OSEH Program Coordinator. All other information was gathered from various web sites on the World Wide Web.

A flow chart was designed showing how the web site would function. All information gathered was organized according to the flow chart in directories on a computer. All text information stored in these directories were either newly created or edited using a word processor.

Development Phase

Layout of the web site followed the flow chart. The design of the web site was determined by viewing other web sites on the World Wide Web and utilizing those features that made those web sites user-friendly. Once the layout and the design of the web site was determined, the process of developing the web site began.

Various types of software were utilized during the development of the web site. Software that was used included: Microsoft Word 2000, Adobe Photoshop 5.0, Macromedia Flash 4, and Macromedia Dreamweaver 3. Microsoft Word 2000 was used to create and edit text, as well as spell check it. Adobe Photoshop 5.0 was used to create and edit images. Macromedia Flash 4 was used to create an animation. Macromedia Dreamweaver 3 was the web editor that was utilized. This program automatically created HTML coding, simplifying the web page development process.

Starting from the top of the flow chart, the home page, or index page was created.

This page contained a brief overview of the OSEH Program, and linked to all the other main areas of the Web site. All remaining pages were created, following the same layout as the home page, for consistency. Images that were created using Adobe Photoshop 5.0 were inserted and positioned on some of the Web pages using Macromedia Dreamweaver 3.

After the Web site was finished, the final step was to publish it and make it available to the public. This was done by transferring the files to the designated server. To make the web site available to as many people as possible, the URL (Web address) of the web site was added to different search and indexing services like Yahoo, AltaVista, and Lycos. The Occupational Safety and Environmental Health Program at this point was at the fingertips of a global audience.

CHAPTER IV: PRESENTATION

The results of the Methodology Chapter was the creation of the Occupational Safety and Environmental Health Program Web Site. The following is a presentation of the OSEH Program Web Site.

UNIVERSITY OF NORTH DAKOTA

OCCUPATIONAL SAFETY & ENVIRONMENTAL HEALTH PROGRAM

WORLD WIDE WEB SITE

http://www.und.edu/dept/it/intro.html

Career Center
Safety Associations
Degree Information
Safety & Health Links
Department Events
Contact Us
Home

UND University of North Dakota
Grand Forks, ND

Occupational Safety & Environmental Health Program

Welcome to the Occupational Safety and Environmental Health Program Web Site.

The Occupational Safety and Environmental Health (OSEH) program is a 58-credit major leading to the baccalaureate degree, bachelor of science. The OSEH program is administered by the Faculty of Industrial Technology. It has a 30-credit core of interdisciplinary course work, which provides a sound professional background. The remaining 28 credits are selected from one of three technical concentrations: Industrial Safety, Industrial Hygiene, or Hazardous Materials. The degree program draws course work from 12 academic departments and utilizes resources from the University's Office of Occupational Safety and Environmental Health.

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Career Center

AltaVista Job Search

Job Title or Keyword | City | State | Submit

- Monster.com job search and resume builder
- empty.net pay site that specializes in environmental, safety, and human resources jobs. Recommended by Jason Wells, B.S. in OSEH, 1999.
- jobsND.com search for jobs in North Dakota
- ehsn.com environmental, health, and safety jobs

DOL Job Openings Search for government jobs

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Safety Associations

- American Society of Safety Engineers (ASSE) - dedicated to the preservation and advancement of work place safety, health, industrial hygiene and environmental issues.
- University of North Dakota Student Section of the Northwest Chapter of ASSE
- Associated General Contractors (AGC) - dedicated to improving the construction industry.
- American National Standards Institute (ANSI)
- American Industrial Hygiene Association (AIHA) - an organization of professionals dedicated to anticipation, recognition, evaluation, and control of environmental factors arising in or from the workplace.
- American Biological Safety Association (ABSA)
- National Safety Council (NSC)
- North Dakota Safety Council (NDSC)
- National Fire Protection Agency (NFPA)

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Safety Associations

University of North Dakota Student Section
of the
Northwest Chapter of ASSE

Founded in 1911, ASSE (American Society of Safety Engineers) is the world's oldest and largest professional safety organization. Its 33,000 members manage, supervise and consult on safety, health and environmental issues in industry, insurance, government and education. ASSE has 12 divisions and 148 chapters in the United States and abroad.

Why you should join the University of North Dakota's Student Section of ASSE?

1. **Interaction with safety professionals.** Through its relationship with ASSE, the Student Section has the opportunity to exchange information with members of the safety community. ASSE members often attend Student Section meetings, and Student members attend ASSE Chapter meetings. This also provides a link between employers and prospective employees.
2. **Membership in a professional organization.** ASSE membership indicates an interest in the safety profession and aids in the development of a safety career path.
3. **Interaction with other students who have similar interests.** ASSE Student Sections offer their members the opportunity to become acquainted with others who are in the same area of study. This extra-curricular contact can provide relationships that will be valuable in business situations following graduation.
4. **Job availability announcements.** *JobLine* is a publication listing job opportunities, which is sent monthly to the Faculty Advisor. Student members seeking employment may subscribe to *JobLine* at no charge.
5. ***Professional Safety.*** Members my receive ASSE's monthly journal, *Professional Safety,* at a reduced cost.
6. **Scholarships.** ASSE and many of its Chapters sponsor scholarship programs involving Student Sections. These programs offer formal recognition opportunities to Student Sections and their members.
7. **Programs.** Student members have an opportunity to learn more about safety through the regularly scheduled meetings of the Student Section and through attendance at Section meetings.
8. **Conferences.** ASSE-sponsored conferences and seminars are available to members of Student Sections at a reduced rate.

To learn more about UND's Chapter of ASSE, contact Ray Diez.

To learn more about ASSE services and benefits, visit their website: www.asse.org

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Degree Information

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Admissions	*Transfer Credit*	*Retention Standards*
Graduation Requirements	*OSEH Program*	*Course Descriptions*

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The Occupational Safety and Environmental Health program is a 58-hour major leading to the baccalaureate degree, bachelor of science. It has a 30-semester hour core of interdisciplinary course work, which provides a sound professional background. The remaining 28 hours are selected form one of three technical concentrations: Industrial Safety, Industrial Hygiene, or Hazardous Materials. The degree program draws course work form 12 academic departments and utilizes resources from the University's Office of Occupational Safety and Environmental Health.

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Admission to the occupational safety and environmental health major program of study is on a competitive basis. Ten students may be admitted per academic year. Students not meeting these minimum requirements may be admitted with probationary status upon recommendation of the Occupational Safety and Environmental Health Admissions Committee, program director, and chairperson of the Department of Industrial Technology.

Admission Requirements

A. A student must have completed the equivalent of 48 semester hours of course work.
B. A student must have completed the following courses (or equivalents) with a minimum grade of C:

Chemistry 121 & 122	8 hours
Biology 150 & 151	8 hours
Physics 161	4 hours
Math 103	3 hours
BVED 217	4 hours

C. A student must have completed 15 hours in residence at the University of North Dakota with a minimum 2.2 GPA. Transfer students will have official transcripts evaluated to determine the 15 hour requirement.

Admission Procedure

Submit:

A. Application form (contact Industrial Technology Department).
B. One reference on the enclosed form. (Sent directly to the University of North Dakota by the person writing the reference).
C. An official transcript of previous course work. (Sent by your institution directly to UND).
D. Essay on "Rationale for Applying for Admission to the Occupational Safety and Environmental Health Program, University of North Dakota."
E. The submitted materials will be examined, analyzed, and a decision will be made on your application. You will receive written notice of that decision. The decision may be that you have been accepted, placed on the waiting list for a succeeding semester, or denied for admission.

Admission Criteria

The application evaluation process will be a blind review of your submitted materials. Four criteria will be used to evaluate a student application to the Occupational Safety and Environmental Health (OSEH) program. Each will have an equal weight in the evaluation process. The following four criteria will guide the OSEH Admissions Committee in the decision-making process.

A. All program prerequisites are met,
B. The official transcript of previous course work has been received for evaluation,
C. The paper "Rationale for Applying for Admissions to the Occupational Safety and Environmental Health Program, University of North Dakota" has been received for evaluation, and
D. The reference submitted in your behalf.

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The program permits transfer credit from two-year and four-year institutions of post-secondary education. Students who have attained the Associate of Science (A.S.) degree from approved programs are eligible to transfer credit into the OSEH program. Transfer students may transfer **selected** credits as approved through the Office of Admissions and Records and the Department of Industrial Technology.

To remain a student in good standing, the student must attain the following:

A. A cumulative GPA of 2.2 and a minimum GPA in the major program of study of 2.5.
B. Submit a portfolio of materials upon completion of 23 hours in the major for a mid-program evaluation of successful progress. Included in this portfolio will be a position paper relating to the goals, objectives, and responsibilities of the safety and health professional.
C. Upon completion of 35 semester hours of the major a written report will be submitted that outlines the student's philosophical position in relation to the student's selected concentration within the occupational safety and environmental health major.

Students not achieving the GPA standard or deemed to not be making satisfactory progress as a result of the mid-program review or not achieving a satisfactory review of the written report will be placed on probation for one semester. At the conclusion of that semester, the student be reevaluated and either returned as a student in good standing or dropped from the program. After two semesters the student may apply for readmission to the major program of study.

* The portfolio will include papers, problems, summaries of activities, materials prepared for future applications, reviews and reactions to current events/new legislation, critiques of journal articles, written safety and/or health programs, evidence of assessment and evaluation activities, field trip reports, etc.

Students must achieve the following to graduate with the Bachelor of Science in Occupational Safety and Environmental Health administered through the Department of Industrial Technology and the College of Business and Public Administration.

A. Meet the graduation requirements of the College of Business and Public Administration.
B. Have a 2.5 GPA in the major program of study.
C. Successful completion of the mid-program review portfolio and the written report.
D. Meet the standards set for the exit examination of the student's selected concentration(s).

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Bachelor of Science Degree in Occupational Safety and Environmental Health

University Requirements

General Education Requirements: (Click here for list of courses which satisfy the General Education Requirements and more specific information).

125 hours to include:

Communication	9 semester hours
Social Sciences	9 semester hours
Arts and Humanities	9 semester hours
Math, Science, and Technology	12 semester hours

Occupational Safety and Environmental Health Curriculum:

58 credit hours to include:
General Core: **(Required)** 30 credit hours

MATH	146	Applied Calculus I	(3)
ANAT	204	Anatomy for Paramedical Personnel	(3)
ECO	210	Intro to Business & Economic Stats.	(3)
PSYC	301	Industrial & Organizational Psych.	(3)
IT	312	Computer Aided Design/Drafting	(3)
OSEH	345	Emergency Response	(1)
HPER	310	First Aid	(2)
ENGL	125	Technical & Business Writing	(3)
ACCT	315	Business in the Legal Environment	(3)
MGMT	300	Principles of Management	(3)
MGMT	302	Human Resources Management	(3)

Plus one of the following Three Options:

Industrial Safety Concentration (Option I)

Required: **28 credit hours** including:

1) The following **15 credits:**

OSEH	440	Industrial Safety	(2)
OSEH	355	Inspections	(1)
OSEH	405	Industrial Hygiene	(3)
OSEH	305	Fire Safety	(2)
OSEH	325	Construction Safety	(3)
OSEH	425	Seminar in OSEH	(3)

2) **13 credit hours** selected from the following:

The following are descriptions of courses offered through the Occupational Safety and Environmental Health Program.

226. Transportation Safety. 3 credits. An introductory course in transportation safety pertaining to personalized and fleet transportation systems. Emphasis will be on human characteristics related to driving, driving improvement, and state/national laws.

305. Fire Safety. 2 credits. Prerequisites: Chem 122. Students will explore and familiarize themselves with those codes that are used to ensure fire-safe environments in structures of all types. The student will learn how to apply these codes to various structures, occupancies, and situations. (F/2)

325. Construction Safety. 3 credits. A study of the rules and regulations of construction. Emphasis will be focused on management techniques, program development, recordkeeping documentation, and training requirements of the construction industry. (F/2)

335. Hazardous Materials. 2 credits. Prerequisites: CHEM 122. Attention will be given to the problems associated with the proper and safe handling of hazardous materials. Special consideration is given to the regulatory requirements, as well as the personal hazards faced by employees who must handle these materials. A discussion of exposure limits, as well as protective measures to be employed will be discussed in the class. Laboratory demonstrations of some of the hazards experienced with certain materials will give an appreciation for the implementation of these protective measures. (S/2)

345. Emergency Response. 1 credit. Prerequisites: Anat 204, PEXS 310 Emphasis is given to addressing problems associated with the proper and safe response to various types of emergencies, including medical emergencies in the workplace. Additional attention will be directed toward accidents or incidents involving fires and hazardous substances. Consideration is given to the regulatory requirements that might be faced by those responding to these types of emergencies. (SS)

355. Inspections.1 credit. Prerequisite: IT 440. Special consideration is given to the problems associated with interactions with management as related to regulatory matters. An awareness of the various rules and regulations which affect the workplace are part of the overview presented by this course. (SS/2)

365. Radiation. 1 credit. Prerequisite: Chem 122. Special emphasisis given to the problems associated with the proper and safe handling of Radioactive Materials in both sealed and unsealed forms. Consideration is given to the regulatory requirements which might face a licensee. (SS/2)

375. Asbestos. 2 credits. A study of asbestos; its characteristics; the rules and regulations regarding asbestos abatement; and the tools, protective equipment, and procedures utilized for asbestos abatement. (SS/2)

405. Industrial Hygiene. 3 credits. Prerequisites: Anat 204, Chem 122. Hazards in the workplace as they relate to our health will be addressed. The course will include the recognition, evaluation, and control of hazards as they relate to industry. (F/2)

415. Waste Handling/Disposal. 2 credits. Prerequisites: IT 335. Both regulatory and environmental protection issues are addressed as they relate to current industrial operations. Emphasis on priority problems being properly identified and solutions planned that are environmentally sound and cost effective. (S/2)

425. Occupational Safety and Environmental Health Seminar. 3 credits. A study of emerging issues and concerns related to the Occupational Safety and Environmental Health profession. Involvement of practicing safety and health professionals and

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Government

University

MSDS Search

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Government

- Occupational Safety and Health Administration (OSHA)
- National Institute for Occupational Safety and Health (NIOSH)
- Environmental Protection Agency (EPA)
- Centers for Disease Control and Prevention (CDC)
- Department of Transportation (DOT)-HAZMAT Safety
- Government Food Safety Information
- Bureau of Labor Statistics-safety and health statistics
- Consumer Product Safety Commission (CPSC)
- U.S. Chemical Safety & Hazard Investigation Board
- Mine Safety and Health Administration (MSHA)
- Federal Register - Latest regulatory information and important notices from all U.S. Government agencies.

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University

- Oklahoma State University - one of the best
- Princeton University - great site
- University of Maryland
- Texas A&M University - lots of information
- University of California, San Diego
- Penn State University
- University of Utah
- University of Oklahoma - great information on fire safety
- Iowa State University
- University of North Dakota

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MSDS Search

- Material Safety Data Sheet Database (University of Vermont)
- Material Safety Data Sheet Database (Cornell University)
- Material Safety Data Sheet Index (Oxford University)
- Material Safety Data Sheet Database (Case Western Reserve)
- Material Safety Data Sheet Database (Louisiania State University)
- EMCI Chemical References (EPA)
- MSDS-Search-free access to over 1,000,000 MSDS's

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Other Links

- Howard Hughes Medical Institute - knowing how to practice safe science.
- Safety Information Resources, Inc. (Vermont SIRI) -great on-line library of safety information.
- Environmental Health and Safety Freeware - on-line databases of information, downloadable software, and lots of other interesting resources related to the environment, health & safety.
- Internet Safety Resource - contains a listing of over 2,000 health and safety Internet based resources.
- SafetyInfo.com

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Department Events

IT/OSEH Picnic

When: Friday, April 28 - 3:30 pm to 9:30 pm
Where: University Park - Shelter #1

Tickets are $5.00/single and $9.00/couple

Door Prizes!! Games!! Presentation of Scholarships!!

Epsilon Pi Tau Initiation

When: Friday, April 28 - 4:00 pm to 5:30 pm
Where: Swanson Room 16 and 18

OSEH 345: Emergency Response (1 credit)

When: June 5 thru June 9
Time: 8:00 am - 12:00 pm, MTWRF

OSEH 355: Inspections (1 credit)

When: June 5 thru June 9
Time: 1:00 pm - 5:00 pm, MTWRF

IT 493: 30 hour OSHA workshop (2 credits)

When: June 12 thru June 16
Time: 8:00 am - 5:00 pm, MTWR

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For more information on the Occupational Safety and Environmental Health program, admission procedures, or any other question, please contact:

Faculty of Industrial Technology
University of North Dakota
P.O. Box 7118
Grand Forks, ND 58202-7118
Phone: (701) 777-2249

E-mail: rebecca_bohlman@und.nodak.edu

CHAPTER V: SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Restatement of the Problem and Objectives

Statement of Problem

The purpose of this study was to develop a World Wide Web site for the Occupational Safety and Environmental Health Program in the Industrial Technology Department.

Objectives

The objectives of this study were to:

- Develop a web site for Occupational Safety and Environmental Health students that can be used as a tool for research, job searching, and accessing other pertinent information related to the program.
- Develop a web site to gain interest and recruit new students throughout the world to the Occupational Safety and Environmental Health Program at the University of North Dakota.
- Design a web site that can be used as a template for other university academic programs setting up similar sites.
- Design a web site that is user friendly to navigate through.

- Design a web site that is user friendly for updating and revision by future webmasters.

Summary

This study was conducted to develop a World Wide Web site for the Occupational Safety and Environmental Health Program. The OSEH Program was without its own web site, until the completion of this project. The web site was designed with the intention of giving students in the OSEH Program another tool to use in pursuing their degree, and to bring the OSEH Program to the rest of the world through the Internet. The web site was designed to be user-friendly to those visiting it, and also user-friendly for future webmasters.

Conclusions

The result of this study was the development of a Word Wide Web site for the Occupational Safety and Environmental Health Program in the Industrial Technology Department at the University of North Dakota. It was determined that a web site specific to the OSEH Program would benefit current students, as well as provide the potential to attract future students to the program.

Recommendations

Recommendations for this study were developed for future webmasters of the web site. Future webmasters of the web site may want to take into consideration the following

recommendations.

1. The World Wide Web site be reviewed and updated on a continual basis to keep information current.
2. All OSEH students should be made aware of the web site. This could be accomplished by posting signs in the Industrial Technology Department, posting it on the three informational computer monitors in the Industrial Technology Department, and by having instructors that teach OSEH courses mention the web site at the start of their classes.
3. Application forms should be made available on-line in PDF format. This would allow prospective students from around the world to print out the application form for applying to the OSEH Program.
4. The utilization of technology, such as; audio, video, and digital photography, be incorporated.
5. Create an on-line form for monitoring user feedback of the web site.

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