

The Virtual
Classroom:
*At the Cutting Edge
of Higher Education*

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Sloan Center for Asynchronous
Learning Environments
(SCALE)

Univ. of Illinois at Urbana-
Champaign

September 28, 1995

Challenges to Learning

- Students in introductory courses need rapid **feedback**, while they are working on a particular subject.
- Students need to have **access** to TA's and faculty when they are studying – not the next day.
- Faculty and TA office hours do not match student study hours.

Challenges to Learning

- We recognize the importance of **active learning**, but many students do not participate in a large lecture class.
- **Teamwork** is important, but it is difficult to get team members together outside of class.
- Students need sense of **community**.

Challenges to Educators

- We need to do more to engage **all** students in active learning.
- **Retention** in many courses is too low, and needs to be increased.
- What can we do to decrease costs and to increase faculty **productivity**?

How to Address these Challenges?

- We believe that networked computers and appropriate software can provide the answer to this question.
- Our original efforts began in January 1994 with funding from the Alfred P. Sloan Foundation - to restructure ECE 270 (Intro. to Circuit Analysis).

Background – ECE 270

- “Introduction to Circuit Analysis”
- ECE 270 is taken by ~400 students per semester.
- It is required in many engineering disciplines: aeronautical, biomedical, electrical, computer, mechanical, industrial, and applied mechanics.

What Students Learn

- Students (mostly sophomores) learn to apply fundamental laws to analyze electric circuits.
- They write equations based on fundamental laws, and solve for circuit variables (current, voltage, power). Problems have quantitative (numerical) answers.

ECE 270 – CircuitTutor[®]

- Stand-alone tutorials provide rapid feedback and help at all hours.
- Network-based homework & quizzes automate the process of collecting and grading students' work.
- Homework and quiz answers are submitted over the Internet via FTP to a UNIX server for instant grading.

CircuitTutor®

CircuitTutor Homework

CircuitTutor® Homework

This **CircuitTutor**® module contains homework problems for a course in introductory circuit analysis, and these problems have been designed to be submitted over the Internet computer network for grading. In addition, this module can be used to obtain the results of each homework problem after it has been graded. The format of these problems is identical to that of problems found in the corresponding **CircuitTutor** modules, and you should make sure that you understand all of the problems in the appropriate **CircuitTutor** module before working the homework problems. Click on the right-facing arrow to continue.

Version 2.0

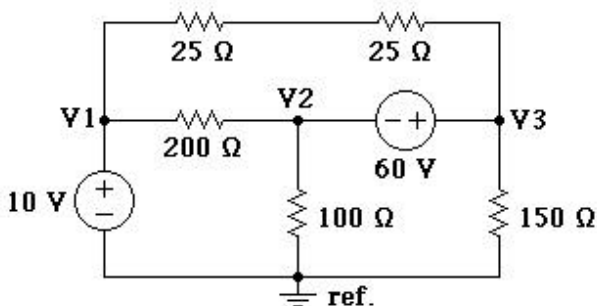
©1995 - TutorWare, Inc.

CircuitTutor®

CircuitTutor Homework

Problem 3.5: Use the node voltage method to calculate the three node voltages, **V1**, **V2**, and **V3**, in the circuit shown below. Enter your answers on the appropriate lines and then click on the "Done" button to submit your work for grading.

V1 = volts
V2 = volts
V3 = volts



CircuitTutor®

CircuitTutor Homework

Filename: PR3PT5.RES

student ECE270A

HW Problem: PR3PT5

Time when graded: 6:52:27 AM, 4/19/95

Results of individual questions (1 = right; 0 = wrong):

1 1 1

3 out of 3 correct; 100 percent correct

Submitted on time; no late penalty.

Total score on this problem = 1.0



Go Back



Print File Contents

World-Wide Web

- Prof. R. Crang - Plant Biology 102

The screenshot shows a Netscape browser window titled "Netscape: Quiz 2: The Role of Plants in Ecosystems". The address bar contains the URL "http://void.ncsa.uiuc.edu:8000/pb102/lect02/quiz.html". The page content includes a title "Quiz 2: The Role of Plants in Ecosystems", a login section with "Network ID: c-studen" and "Password: ●●●●", and a list of four multiple-choice questions. The fourth question is expanded to show a list of options: "?", "simple sugars.", "✓ amino acids.", "nitrogenous bases.", "fatty acids.", and "micronutrients." The browser's status bar at the bottom shows the address bar and navigation icons.

Netscape: Quiz 2: The Role of Plants in Ecosystems

Location: <http://void.ncsa.uiuc.edu:8000/pb102/lect02/quiz.html>

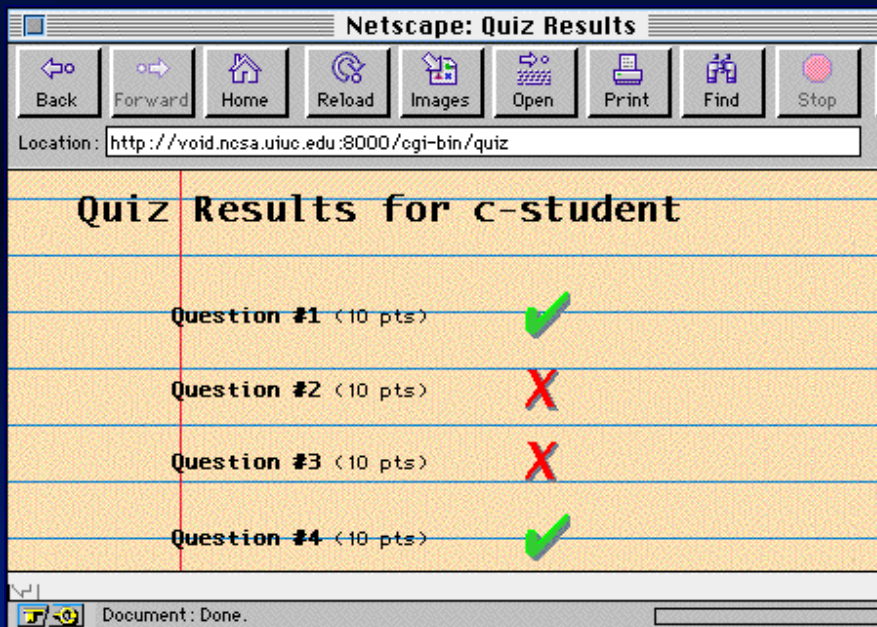
Quiz 2: The Role of Plants in Ecosystems

Network ID: Password:

1. Which is **not** true? ▼
2. Ecosystems ▼
3. Net primary productivity is ? ▼
4. The building blocks of proteins are ▼
 - ?
 - ✓
 -
 -
 -

World-Wide Web

- Prof. R. Crang - Plant Biology 102



The screenshot shows a Netscape browser window titled "Netscape: Quiz Results". The address bar contains the URL "http://void.ncsa.uiuc.edu:8000/cgi-bin/quiz". The main content area displays "Quiz Results for c-student" and a list of four questions with their scores and status:

Question	Points	Status
Question #1	10 pts	✓
Question #2	10 pts	✗
Question #3	10 pts	✗
Question #4	10 pts	✓

The browser's status bar at the bottom shows "Document: Done." and a progress indicator.

World-Wide Web

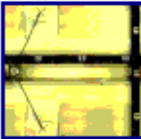
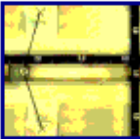
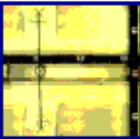
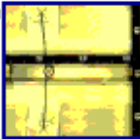
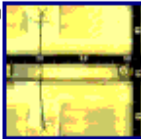
- Prof. A. Hübler -
CyberProf™

Netscape: [CyberProf] Kruse Slingshot, Picture 2

Back Forward Home Reload Images Open Print Find Stop

Analyze the Launch

[\[review movie\]](#) [select image to see it full scale]

a)  b)  c)  d)  e) 

In which picture does the puck have the smallest velocity?

Picture (a) ▼

⏪ ⏩

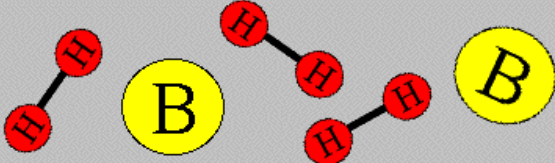
World-Wide Web

- Prof. B. Whitmarsh -
Chem 102b

Netscape: CyberProf

Back Forward Home Reload Images Open Print Find Stop

Location: <http://www.ccsr.uiuc.edu/cyberprof-bin/CyberProf?filename=../protected/Chemistr>



Calculate ΔH (in kJ) for the synthesis of diborane from its elements

$$2\text{B}(s) + 3\text{H}_2(g) \longrightarrow \text{B}_2\text{H}_6(g)$$

Using the following data:

	ΔH (kJ)
$2\text{B}(s) + 3/2\text{O}_2(g) \longrightarrow \text{B}_2\text{O}_3(s)$	-1273
$\text{B}_2\text{H}_6 + 3\text{O}_2(g) \longrightarrow \text{B}_2\text{O}_3(s) + 3\text{H}_2\text{O}(g)$	-2035
$\text{H}_2(g) + 1/2\text{O}_2(g) \longrightarrow \text{H}_2\text{O}(l)$	-286
$\text{H}_2\text{O}(l) \longrightarrow \text{H}_2\text{O}(g)$	44.0

$\Delta H =$

Student Learning

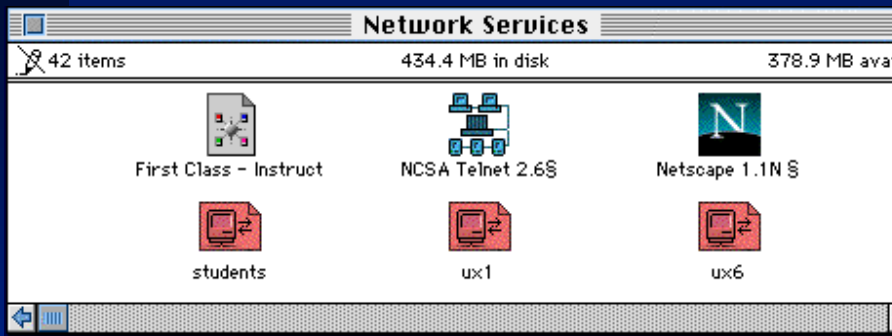
- What happens when a student does NOT understand a certain topic?
- The student can discuss the problem
 - with a peer
 - with a teaching assistant (TA)
 - with a professor.
- There is a need for individualized attention – involving contact with other **PEOPLE.**

FirstClass Software

- Permits asynchronous conferencing using networked computers.
- Commercial product (\$5 per user).
- Client-server architecture.
- Macintosh & Windows clients.
- Uses TCP/IP protocol.
- >3500 student users on UIUC campus.

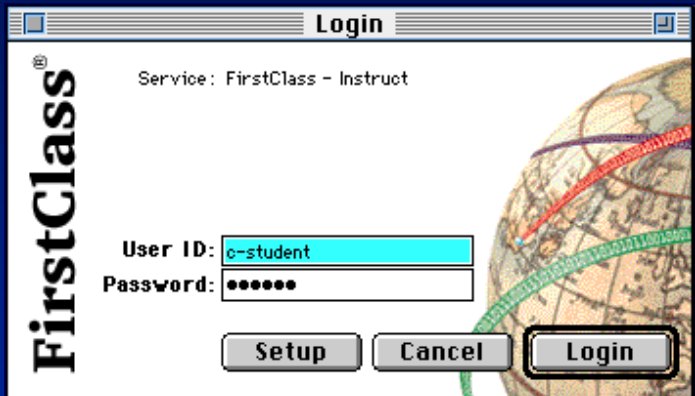
FirstClass – Access

- The client software is installed on all CCSO and housing computers, and students can install the client software on their own computers.



FirstClass – Logging In

- Each student has a unique User ID - it is the same as the “Net ID” used with the on-line registration system.



FirstClass - Interface

- Has a graphical user interface – icons represent “conferences”.



FirstClass - Conferences

- Easy to organize on-line discussions.

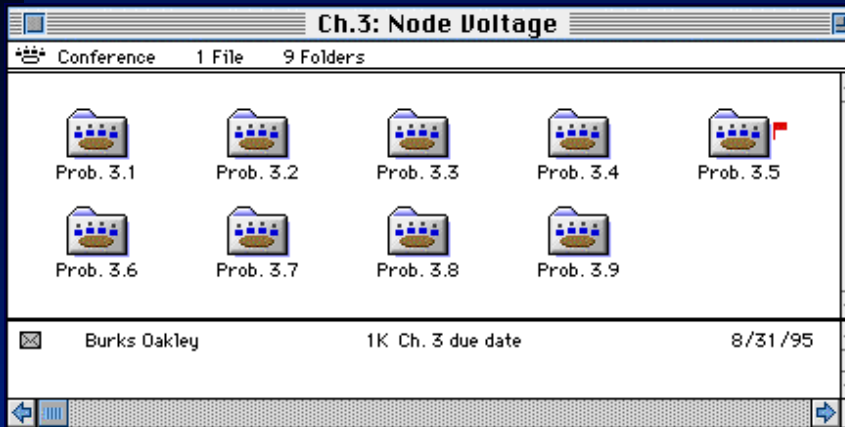
ECE 270 Fa95
Conference 7 Files 10 Folders

Folder icons and labels:
ECE 270 Exams
Ch.1 : Basic Concepts
Ch.2 : Resist. Ckts.
Ch.3 : Node Voltage
Software Question
ECE 270 Chat
ECE 270 Students
Ch.4 : Mesh Current
Ch. 5 : Equiv. Ckts.
ECE 270 Annouceme

	Burks Oakley	1K Re: alert beeps	9/1/95	5:24 AM
	Kurt Wilcox	1K alert beeps	9/1/95	5:18 AM
	Eric Wyers	1K Posting messages	8/30/95	10:26 AM
	Burks Oakley	1K Changing Sections	8/30/95	9:55 AM
	Burks Oakley	40K Include a subject heading	8/30/95	5:00 AM
	Burks Oakley	2K CircuitTutor Distribution	8/30/95	4:52 AM
	Steven M. Carroll	1K FIRST CLASS NOTICE FROM TA's	8/29/95	2:30 PM

FirstClass

- Conferences can be “nested” to provide interaction on a very specific topic.



FirstClass – Threading

- Postings to a conference make up a “threaded” conversation.

Prob. 3.5					
Conference 10 Files 0 Folders					
		Pat T. Aaye	1K Re[3]: Help needed with Prob. 3.5	9/3/95	1:30 PM
		Chris Student	44K Re[2]: Help needed with Prob. 3.5	9/3/95	1:29 PM
		Pat T. Aaye	1K Re: Help needed with Prob. 3.5	9/3/95	1:27 PM
		Chris Student	45K Help needed with Prob. 3.5	9/3/95	1:26 PM
		Burks Oakley	16K Wilson's question	9/3/95	4:34 AM
		Kwong S. Lin	1K Re(3): How do I get started?	9/2/95	10:55 PM
		Wilson Fung	1K Re(2): How do I get started?	9/2/95	10:51 PM
		Kwong S. Lin	1K Re: How do I get started?	9/2/95	10:43 PM
		Wilson Fung	24K How do I get started?	9/2/95	10:40 PM

Virtual Assistance

- A student posts a question.

Help needed with Prob. 3.5

Sunday, September 3, 1995 1:26:10 PM
Form

From: Chris Student
Subject: Help needed with Prob. 3.5
To: Prob. 3.5

Picture Preview

EQUATION EDITOR			
$V_1 = 40$	volts	$V_1 = 40$	
$V_2 = 80$	volts	$V_2 = 80$	
$V_3 = 40$	volts	$V_3 = 40$	

Hi everybody! I am trying to solve problem 3.5 - the computer grader says two of my answers are wrong. :-((The attached picture shows my **circuit** and the three **equations** I wrote. Can anybody tell me what I am doing wrong? Thanks!

Virtual Assistance

- A student posts a

Picture

CircuitTutor Homework

Eqn. 1: $V1 = 40$	$V1 = 40$	Solve
Eqn. 2: $V2 - 30 = V3$	$V2 = 44$	Restore
Eqn. 3: $(V1 - V2)/80 + (V1 - V3)/20 = V2/80 + V3/20$	$V3 = 14$	Clear
		Done

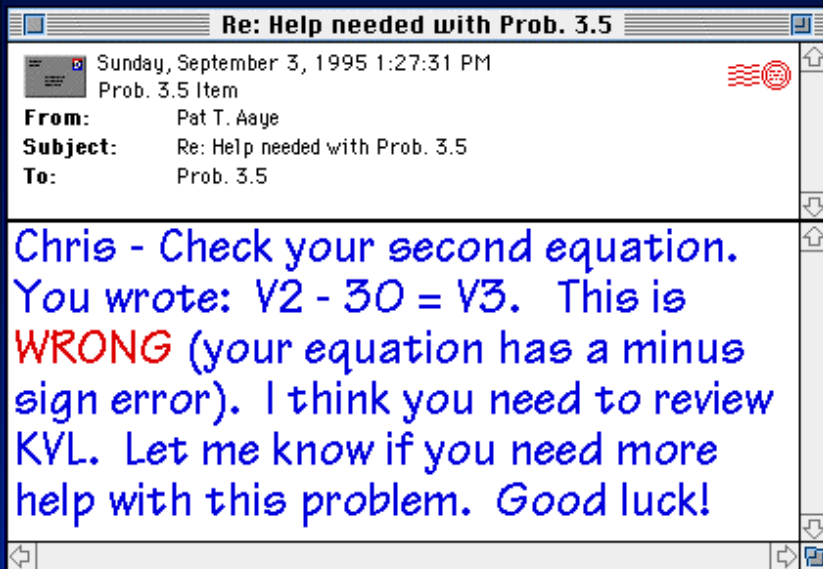
$V1 = 40$ volts
 $V2 = \text{XXX}$ volts
 $V3 = \text{XXX}$ volts

Prob. Menu
Eqn. Solv.
E
Check
Done

two of my answers are wrong. The attached picture shows my circuit and the three equations I wrote. Can anybody tell me what I am doing wrong? Thanks!

Virtual Assistance

- An on-line TA posts a response moments later.



Re: Help needed with Prob. 3.5

Sunday, September 3, 1995 1:27:31 PM
Prob. 3.5 Item

From: Pat T. Aage
Subject: Re: Help needed with Prob. 3.5
To: Prob. 3.5

Chris - Check your *second* equation. You wrote: $V_2 - 30 = V_3$. This is **WRONG** (your equation has a minus sign error). I think you need to review KVL. Let me know if you need more help with this problem. Good luck!

Virtual Assistance

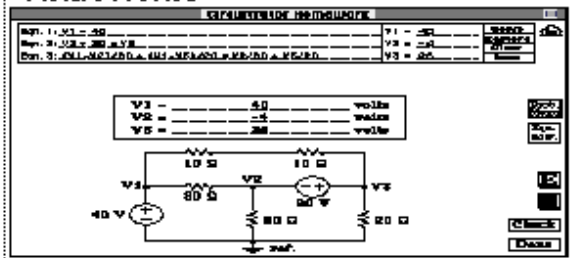
Re[2]: Help neede with Prob. 3.5

Sunday, September 3, 1995 1:29:10 PM
Form



From: Chris Student
Subject: Re[2]: Help neede with Prob. 3.5
To: Prob. 3.5

Picture Preview



Thanks Pat! The correct equation was: $V2 + 30 = V3$. The computer grader says that my new answers are correct! Thanks for your help!!! :-))



Virtual Assistance

Picture

CircuitTutor Homework

Eqn. 1: $V_1 = 40$	$V_1 = 40$	Solve	
Eqn. 2: $V_2 + 30 = V_3$	$V_2 = -4$	Restore	
Eqn. 3: $(V_1 - V_2)/80 + (V_1 - V_3)/20 = V_2/80 + V_3/20$	$V_3 = 26$	Clear	
		Done	

$V_1 =$	<u>40</u>	volts
$V_2 =$	<u>-4</u>	volts
$V_3 =$	<u>26</u>	volts

Prob. Menu

Eqn. Solv.

E

Check

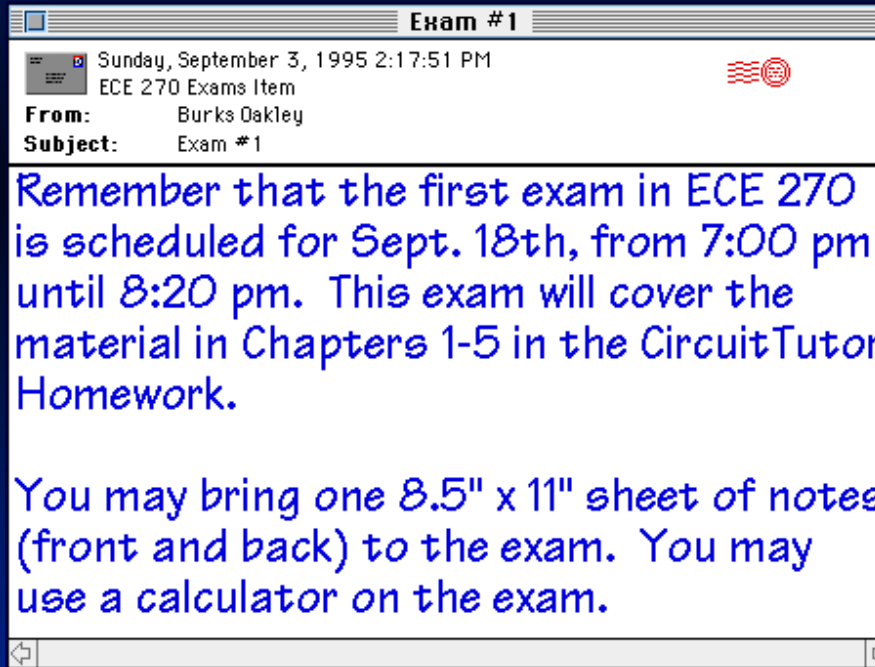
Done

correct! Thanks for your help!!! :-))

Course

Information

- Easy way to distribute course material.



The screenshot shows an email window with the following details:

- Title:** Exam #1
- Date/Time:** Sunday, September 3, 1995 2:17:51 PM
- Sender:** Burks Oakley
- Subject:** Exam #1

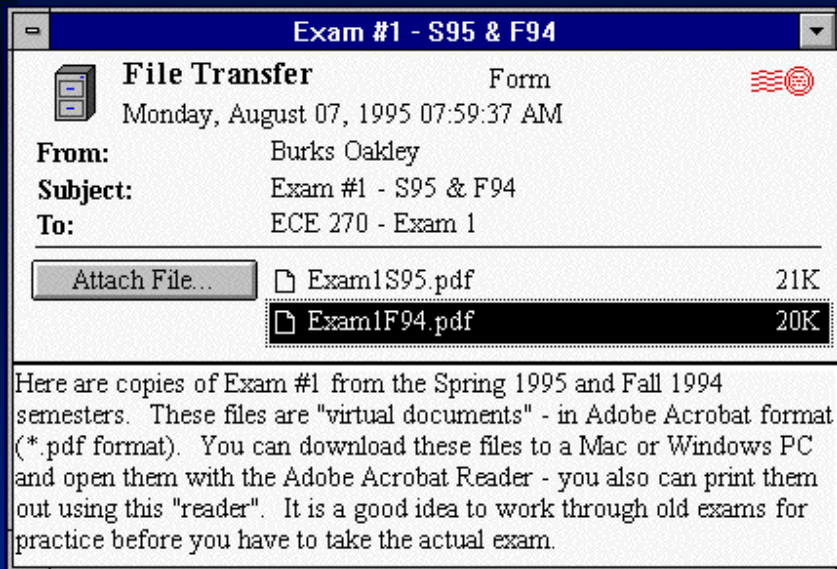
The email body contains the following text:

Remember that the first exam in ECE 270 is scheduled for Sept. 18th, from 7:00 pm until 8:20 pm. This exam will cover the material in Chapters 1-5 in the CircuitTutor Homework.



You may bring one 8.5" x 11" sheet of notes (front and back) to the exam. You may use a calculator on the exam.

Virtual Documents

- Can be read cross-platform (on both Macintosh and Windows computers).





Exam #1 - S95 & F94

 **File Transfer** Form 

Monday, August 07, 1995 07:59:37 AM

From: Burks Oakley
Subject: Exam #1 - S95 & F94
To: ECE 270 - Exam 1

 Exam1S95.pdf	21K
 Exam1F94.pdf	20K

Here are copies of Exam #1 from the Spring 1995 and Fall 1994 semesters. These files are "virtual documents" - in Adobe Acrobat format (*.pdf format). You can download these files to a Mac or Windows PC and open them with the Adobe Acrobat Reader - you also can print them out using this "reader". It is a good idea to work through old exams for practice before you have to take the actual exam.

Virtual Documents

- Macintosh to Windows, & *vice versa*.

Acrobat Reader - [EXAM1F94.PDF]

File Edit View Tools Window Help

1. Use the node voltage method to analyze the circuit shown below.
In this circuit, $\alpha = 1$ volt/ampere and $R = 1 \Omega$.

The circuit diagram shows a network of nodes and components. The reference node is at the bottom. Node V_1 is at the top left, connected to a current source IS_1 (pointing up) and a resistor R . Node V_2 is at the top right, connected to a resistor R , a current source IS_2 (pointing down), and a voltage source VS (positive terminal at V_2). A dependent current source αI_x is connected between V_1 and the reference node, with an arrow pointing down. A resistor R is connected between V_1 and V_2 . The current through this resistor is labeled I_x .

Asynchronous Conferencing at UIUC

- Other UIUC faculty have started using FirstClass (or PacerForum) as a regular part of their classes.
- During the Fall 1995 semester, over 40 classes in 7 different colleges are using asynchronous conferencing.

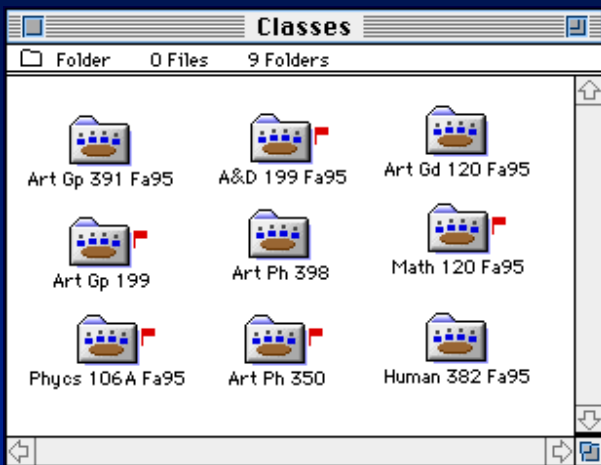
Courses using FirstClass

- The “Classes” folder from “Instruct”.



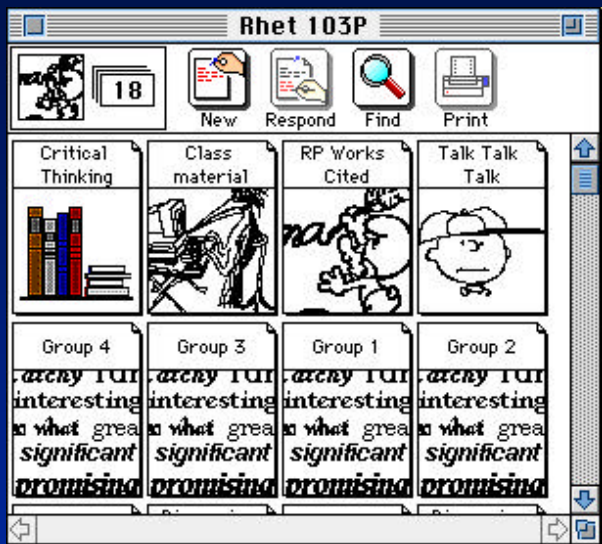
Courses using FirstClass

- The “Classes” folder from “Collaborate”.



PacerForum

- Rhetoric 103 - Sibylle Gruber.
- Short essays - building community.



PacerForum

Critical Thinking

159

Respond Goto Find Print Erase Next U


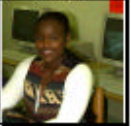


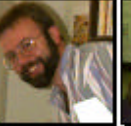


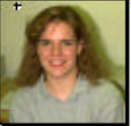
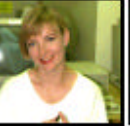

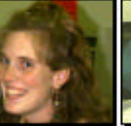
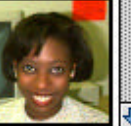
148. Leo Thompson 11/16/94 5:42 AM

Legalizing marijuana has been a hot debate for a while now. I truly believe that if cigarettes and alcohol have the standards to be legalized then so does marijuana. Don't get me wrong now I am in no way promote this cannabis ,but I feel that legalizing marijuana could open up a large profitable industry which inevitably will open up more job opportunities also strongly believe that if this cannabis was legalized then a number of people who smoke it will decrease their habits because of the lack of thrill they would receive. By thrill I mean that when people do things that are illegal and get away with it they get some sort of thrill that promotes them to do it over and over again. One reason why I think marijuana has not been legalized yet is because of the negatives that will be instilled upon those who promote the legalization of such a product. Politicians these days fear what would happen to their image if they promote such substance.

Virtual Discussions

- English 493 - Prof. Gail Hawisher.

The screenshot shows a web browser window titled "English493". The interface includes a navigation bar with icons for "New", "Respond", "Find", and "Print". Below this is a grid of discussion forum tiles, each featuring a title and a small photograph of a participant. The tiles are arranged in two rows of six. The first row contains: "On Textbooks", "Ladonya's Forum", "On Critical Pedagogy", "On POMD", "Men's Forum", and "Jennie's Forum". The second row contains: "Stacey's Forum", "Susan's Forum", "Jamie's Forum", "David's Forum", "Leisa's Forum", and "Anita's Forum". The interface also includes a sidebar on the right with navigation arrows and a status bar at the bottom with a back button and a refresh button.

On Textbooks	Ladonya's Forum	On Critical Pedagogy	On POMD	Men's Forum	Jennie's Forum
					
Stacey's Forum	Susan's Forum	Jamie's Forum	David's Forum	Leisa's Forum	Anita's Forum
					

Critical Thought

On Critical Pedagogy



Respond

Goto

Find

Print

Erase

Next

U

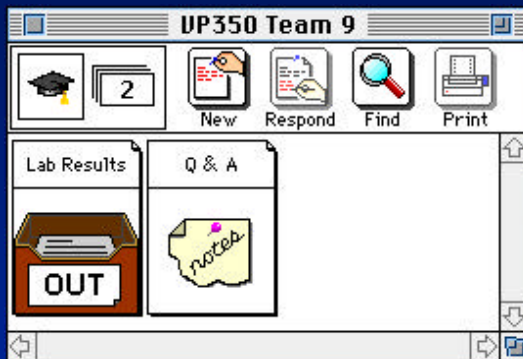
Here's some further comments re: the ongoing crit. ped. exercise Stacy and I are conducting. I'm concerned about my students current understanding of "rights" and whether a short term exercise regarding rights violations is fighting a losing battle due to their misunderstandings. To clarify, one of the readings handed out specifically talked about the legal definition of 14th ammendment non-discrimination requirements. We read this section outloud. Yet st I had a student (an Asian international student) describe his personal rights violation as being when a car parked in his parking space and he had to have it towed. Admittedly, John Locke would say your damn rig it was a rights violation: Property is a right. However, my student framed the story in terms of discrimination. I wonder if this student's response is generalizable or if it was a particular response due to his background.

A second comment. I found that almost all of the students' responses focused on the same thing: mistreatment by the police/security guard I wonder if this is due to similarity of experiences or because these w examples students gave in class and other students, due to their lack



Simulations

- Veterinary Pathology - Dr. R.D. Smith.
- Each team simulated (in real-time) a disease outbreak lasting 3 days.



Real-Time Simulation

Lab Results

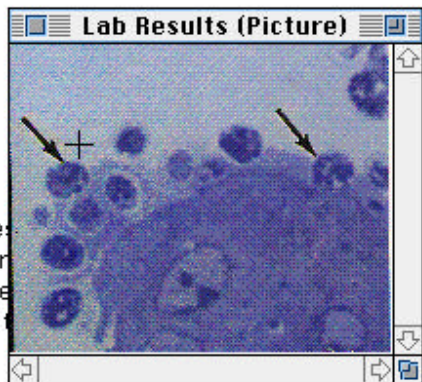
OUT 3 Respond Goto Find Print Erase Next Un

9. Fecal culture on ferret feces
NORMAL COLIFORM BACTERIA ONLY

What are the results on the fecal?

Histopathology










Microscopically lesions of the intestine: hyperplasia. The brush borders of the entire half of most villi in the middle and lower severely parasitized by small, round (2



Histopathology: Denuded mucosal epithelium with organisms consistent with *Cryptosporidium parvum* were found (see picture).

Increased Student-Faculty Interactions

Chat with Jones

97. John Ramon 2/2/95 6:58 PM

I just have a few quick questions on Aristotle's writing's even though we are just about finished talking about him. Who specifically was Aristotle writing for? Who had access to these texts and who benefitted from these texts?

I am just curious to see if these writings were intended for the elite of the Greek society.
\$-\$

98. Bob Jones 2/2/95 7:00 PM

You can assume that these texts were written for the elite of Athenian society. Not for the rest...

Increased Student- Student Interactions

Re: Sammons R#2

Thursday, September 7, 1995 9:36:22 AM

Response Papers, 9:AM Item



From: Elizabeth Smith
Subject: Re: Sammons R#2
To: Response Papers, 9:AM

Hi. I was reading through some papers and thought I'd respond to yours, I hope you mind. I agree with your comments and they helped add a new perspective on to how thinking about the heroes. I have a few questions for you though. Yes, Hektor's motif displaying her breast symbolized his vulnerability as a human, but can it symbolize a differences in Hektor's family and Akhilleus? Even using Hektor's relationship with wife and child as a reflection of how he was raised, can you see a difference (or many between Akhilleus and Hektor? Hektor was faithful, he viewed the war as his job and destiny, but not really as his life, he was calm, decisive (relatively), and strong. Akh was brought up in a half-god, half-mortal situation. You never hear about his father apparently has a wife, but is after the conquest of Troy, he is totally indecisive, he is mommy, he is a spoiled little brat. I view Hektor as the greater of two heroes by my non-Mediterranean perspective, and view Akhilleus as someone who needs a good slap. Anyway, just a few thoughts. Thanks for giving me a new perspective to work with, forward to reading more of your papers. -Beth

Learning Opportunities for Students

- Students are applying technology in many diverse fields.

This computer stuff is great!

Wednesday, September 6, 1995 9:15:04 AM
CLit 141 Fa95 Item



From: Hernando Rodriguez
Subject: This computer stuff is great!
To: CLIT 141 FA95

Last night I was reading the Illiad at Grainger Library. Since we are using the campus network, I strolled over to a computer, wrote my response paper with my campus network computer account, was able to **edit what I wrote**, and could spell check what I wrote :-). Now this morning on FirstClass I'm taking what I wrote last night and reworking it after **reading other responses from other students**. I'm probably putting 10 times more thought and time into the response paper with FirstClass than otherwise. Matter of a fact, I'm skipping my Biology class right now because of FirstClass!

Empowers Faculty

- Faculty can add or delete specific discussion areas as needed.

The screenshot shows an email client window titled "Econ 300 Fa95". The interface includes a header bar with "Conference", "34 Files", and "8 Folders". Below this is a grid of folders: "Greetings", "First Problem Set", "Turn in Homework Here", "Econ 300 Staff Only", "Economist Jokes", "Arvan's Lecture Notes", "Congestion Problems", and "Fun". At the bottom, a list of messages is displayed with columns for sender, subject, size, and date/time.

Sender	Subject	Size	Date	Time
Lanny Arvan	3K CCSO Saturday Courses		9/1/95	11:35 AM
Angela Lindeman	1K Dial in connection		9/1/95	12:22 AM
Lanny Arvan	2K If you're not busy on a satur		8/31/95	8:40 PM
Lanny Arvan	1K Re: Problems retrieving lectu		8/31/95	3:50 PM

Efficient Use of Time

- Faculty no longer need to have weekly meetings with their TA's.

The screenshot shows an email client window titled "ECE 270 TA's". The interface includes a toolbar with "Conference", "42 Files", and "4 Folders". Below the toolbar are four folder icons: "270 TA Schedule Changes", "Chat with Prof. Peck", "270 TA Introductions", and "ECE 270 TA Notices". The main area displays a list of six messages, each with a checked box icon, sender name, subject, and timestamp.

Message Icon	Sender	Subject	Date	Time
☑	Eric Wyers	1K Re(2): Pictures	9/1/95	8:49 AM
☑	Burks Oakley	1K Re: Pictures	9/1/95	5:26 AM
☑	Kwong S. Lin	1K Pictures	8/31/95	9:25 PM
☑	Burks Oakley	1K Re: Problem with HW #2.5	8/31/95	1:54 PM
☑	Corey A. Garrow	1K Problem with HW #2.5	8/31/95	12:38 PM
☑	Eric Wyers	1K Re: Ch. 2 due date??	8/31/95	12:02 PM

Efficient Use of Time

- Faculty can work from home at convenient hours.

The screenshot shows a web browser window with the title "Ask Prof. Peck". The address bar contains "115". The browser's toolbar includes icons for Respond, Goto, Find, Print, Erase, Next, and Unread. The main content area displays a quiz question:

72. Meghan Sullivan 2/12/95 1:32 AM

Professor Peck:
When you take a quiz several times, does your best score count or does your last try count?

73. Tim Peck 2/12/95 6:14 AM

Meghan - your best score always counts on the quizzes.

Computer Conferencing

- Provides “virtual office hours” - at the times when students work.
- Provides cost-effective TA support to large lecture courses.
- Promotes teamwork.
- Builds sense of community.
- Increases student access to faculty and TA’s outside of the classroom.

Preliminary Outcomes

- Increased retention - fewer drops.
- Improved test performance.
- Very positive student evaluations.
- Less faculty time spent in meetings.
- More efficient use of faculty time - increased “transaction density”.
- No increase in cost - through more efficient use

Improved Retention

- Average of previous 7 semesters in ECE 270 – **12.8%** drop rate (ranging from 9.4% to 19.0%).
- Spring 1995 semester – we observed a **6.6%** drop rate.
- The networked homework and the on-line conferencing system combine to provide additional support to the “marginal” students.

Impact on Course Grades

- ECE 270 – Fall 1994 – 2 “traditional” sections, 3 “computer-based” sections:

Course Grade	Traditional	Computer-Based
A	17.4	38.1
B	%	%
C	31.8	26.0
D	%	%
E	35.6	21.5
	%	%
	6.8%	6.6%

Faculty

Productivity

- In the Spring 1995 semester, we increased the student/faculty ratio in ECE 270 by 50%.
- We taught four sections, with a total of 420 students (vs. five sections, 350 students, in the Fall 1994 semester).
- No loss in quality of learning (55% of all students scored $\geq 90\%$ on Exam #2).

Sloan Center at UIUC

- We have received additional support from the Sloan Foundation and the UIUC provost to implement the **Sloan Center for Asynchronous Learning Environments (SCALE)**.
- We are integrating Asynchronous Learning Networks (ALN) into courses in many different curricula at UIUC.

Goals of SCALE

- Evaluate the impact of these new ALN courses on certain outcomes:
 - Retention, time-to-degree
 - Economic issues (e.g., faculty productivity)
 - Faculty “quality of life”
- Provide a test of the value of ALN courses ON a campus.
- Disseminate our approach to other universities (especially CIC schools).

SCALE - Revised

Courses

- Ag 100, AgEcon 100, AgEcon 339, ArtGD 120, Art GP 199, ArtPH 350, ArtGP 391, ArtPH 398, BioE 199, Bio 100, Bio 101, Bio 122, Chem 102B, Clas 112, Clas 116, CLit 141, Econ 102, Econ 300, ECE 110, ECE 270, ECE 290, ECE 375, Engl 103, Engl 296, Engl 302, Engl 493, FS 199, FN 240, Human 382, Kines 300, Math 285, M&IE 383, Phys 101, Phys 106, Phys 319, PIBio 102, Rhet 105, Rhet 133, Soc 122, Soc 222, UP 212, WS 332.

SCALE - Revised

Courses

- First Year & Discovery Program
 - ECE 110, BioEng 199, Ag 100, FS 199
- General Education
 - Soc 122, Econ 102, AgEcon 100, CLit 141
- Early Work in Major
 - Biol 104 & 122, Econ 300, Chem 102, UP 212, PlantBio 100 & 102
- Capstone Courses in Major
 - M&IE 393, ECE 375, Kines 300, AgEcon 339

SCALE - Other Projects

- Writing Across the Curriculum
 - On-Line Writers' Workshop
- Advising
 - Advising WorkBench (AWB)
- Pilot Projects - Development
 - Calculus & Mathematica
 - Women's Studies
 - Classics
 - Other courses will be added

SCALE -

Training

- We have a major effort targeted at training:
 - faculty
 - teaching assistants
 - students
- Central to this effort are workshops, seminars, and the creation of detailed tutorials that are available on the World-Wide Web.

SCALE - Evaluation

- We also have a major effort targeted at evaluation of SCALE courses.
- The evaluation is being conducted by personnel from the UIUC Office of Instructional Resources.
- They are using direct observation, surveys, interviews, and comparative data in the evaluation process.

Implications for the Future

- Students and faculty will need increased **access** to networked computers both on- and off-campus.
- Faculty will need **incentives** to adopt new educational technologies and to develop new networked courses.
- There will be an on-going need for quality **training** and **support**.

The Virtual Classroom

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