STEP Syllabus

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This will be a **hands-on** workshop!

Whenever there is no instructor listed, the material will be presented by Kris Stewart.

Tuesday July 6

8 am IR/PS 3203

Welcome to STEP - Bob Dean (rdean@ucsd.edu)

Initial STEP Survey - Pat Sumi (psumi@ucsd.edu)

Welcome to STEP/Overview of 3 week program
Introduce Lead Teachers and their Study Groups
Name your group by high school
Question: Mac or PC version of Matlab? Comm software? (if you already have modem software, what is the name - bring in the manual tomorrow)

9 am Begin introduction to the concept of a programming language using C as example. Instructors: **Dave Parker/Dave Harlow**

This course will provide an introduction to the concept of a programming language. The 40 STEP participants will be divided into two groups since we have two facilities. The first is the Training Room at SDSC which houses 20 Macintosh IIsi computers and will be set up to run the software included with the book Learn C on the Macintosh by Dave Mark (Addison-Wesley Pub.) The second site is a classroom in a building which is adjacent to SDSC (IR/PS 1201 - International Relations and Pacific Studies). The PTEST's office and an SDSC Macintosh Powerbook will both be on loan for the instructors to use during lectures.

Each group of 20 STEP participants will be assigned to one of the C instructors for the four day introductory course. The STEP lead teachers will be assigned to each of these groups also to learn the material and help with the Macintosh lab sessions which Parker/Harlow have developed.

The two groups will alternate in two hour time slices between lectures in the IR/PS classroom and hands-on computer work in the SDSC Training Room.

Monday, July 12 - STEP begins - Telecommunications Week

8 am Dr. Don Anderson, Dean, College of Natural Science, UCSD and STEP Principal Investigator (danderso@ucsd.edu)
Welcome to STEP

8:15 Dr. Dan Sulzbach, Executive Director, SDSC (sulzbach@sdsc.edu)
Welcome to SDSC/What is a supercomputer?

9 am break for coffee

9:15 Big Picture
Where we are headed. What facilities we have.
Model: Open-end box for computing expertise.

10 Introduction to hardware/software
Computer Responsibility (Ethics)
What is an operating system?
How to be functional with **UNIX - Round 1**

11 How to log on to sdcc14

noon Lunch

1 pm Afternoon lab in auditorium

Identify SIGs - ones proposed:
- Biology
- Physics
- Chemistry
- Computers
- Integrated/Coordinated Science
- Bilingual Studies

2 pm Work through the exercises presented in the Introduction to Unix handout.

2:30 Telnet to CORE and get your CORE account set up.

3 pm Handout Review Questions to be discussed later

3-3:15 pm Break for coffee (then back to the exercises)

4pm Study groups meet to discuss the review questions.
Help one another with any problems.

4:30 Groups report on progress or problems to everyone. We want to work collectively, so share any problems or questions (there's probably someone else who was also confused by the same topic).

Tuesday, July 13

8 am Internet as a Highway for Communication
Introduction to Electronic Mail
Protocols - Courtesy is the Key
What you can expect to accomplish via email.

10 am Break

10:15 Elm - Introduction to concepts and commands
Initial exercise - read a mail message that is waiting for you from your Lead Teacher

11:30 Tips to keep in mind for "effective" communication

noon Lunch

1 pm Electronic Mail Exercises
1. send mail to yourself
2. reply to a message
2. save mail in a folder (default name)
3. save mail in a folder (your choice of name)
4. reply to mail including copy of sender's mail
5. forward a mail message to someone else
6. reply to a questionnaire by editting
7. sending a file via email

Find where within Unix these files are stored

I will email recent Info-Mac and Info-PC. Do you want further issues? Note: we don't expect you to understand everything in these postings. Typically, a person browses through the **headers** from Info-Mac or Info-PC. The text part is read only for the **headers** of interest. You'll want to develop the skill of **filtering information** as you start exploring the Internet. This take time and practice.

3 pm Handout Review Questions to be discussed later

3-3:15 pm Break for coffee (then back to the exercises)

4pm Study groups meet to discuss the day's review questions. Help one another with any problems.

4:30 Groups report on progress or problems to everyone. We want to work collectively, so share any problems or questions (there's probably someone else who was also confused by the same topic).

Homework Assignment:

Read "What is the Internet" in your Workshop Notebook tonight.

Wednesday, July 14

8 am	The Internet as an Info-Source The Whole Internet User's Guide & Catalog Mail lists of Interest Educom and EduPage FAQ (rtfm.mit.edu)
9 am	Gopher as a tool to traverse the Internet
10 am	**Break**
10:15	Short Exercise - **gopher ucssun1.sdsu.edu** look in /pub/stepinfo
11	Format of data Mac versus PC storage ascii vs. binary vs. Unix-compressed Sources of information: CERFNet **gopher is.internic.nic** Other sources of information **gopher merit.nic.edu** **gopher eis.calstate.edu**
noon	**Lunch**
1 pm	Internet Exercises Lead Teachers' Personal Favorites from your notes More Email Exercises aliases for the groups/SIGs signature using **frm** to examine an Elm folder **c**hanging folders within Elm
4pm	Critique today's material (same format as before)

Home Work Assignment:

Read Chapter 6, Moving Files: FTP in Whole Internet book.

Thursday, July 15

8 am Working with **Unix - Round 2**

9 am Exercise - Installing communications software on a Macintosh and on an IBM/PC. Then dialing in to sdcc14

10 am **Break**

10:15 Communications on a personal computer to sdcc14

Noon and rest of the day is one big exercise. Lead teachers will be available in afternoon if you have questions.

We'll have a trouble-shooting phone line: **534-8313**

Call if you have any problems.

Take the disk we have assembled with a Shareware version of the communications software (**Zterm** for the Mac; **Telix** for the IBM/ PC). Return to your "home" location and install this software in the same way we did this morning. Access your account on sdcc14 and send a mail message to your Lead Teacher about your success.

If things don't go well, keep track of what happened? How far did you get in the installation process? What message was written out by your home computer (need to know this "word for word" as it appeared on your screen). We'll troubleshoot together on Friday afternoon.

Home Work Assignment:

Read Chapter 8, Network News in Whole Internet book tonight.

Friday, July 16

8-noon Image Processing for Teaching: Exploration and Discovery in Math and Science
R. Kolvoord (U. of Arizona, kolvoord@lpl.arizona.edu)

The Image Processing for Teaching project uses microcomputers and digital images to provide a powerful medium to excite students about science and mathematics, especially groups not traditionally attracted to these subjects.

noon Lunch

1-4 Troubleshoot the modem "adventure" yesterday with the whole group.

Downloading software from sumex-aim for Mac

How to download using SDSC/Mac (**fetch**)

Site for PC: **oak.oakland.edu**

How to download using home modem.

Discuss **USENET News Groups**

4pm Critique this week's material.

Lead teachers discuss how to plan a classroom example since the network may be down (screen captures?).

Have a Good Weekend

Check your Email!

Monday, July 19 Introduction to Computational Science Week

8 am Dr. Mary S. Trainor, Los Alamos National Laboratory (mst@lanl.gov)

Computational Science: What and Why?

9 am Dr. Trainor continues

New Mexico Supercomputing Challenge: Student and Teacher Experiences

10 am Short Video

NSF Grand Challenges

10:05 **Break**

10:20 Introduction to MatLab
- A tool for computational science
- What is a model?
- What is a numerical method?
- The capabilities of Matlab (demostep)

11:20 Work with genotype distribution (stochastic) model

noon Lunch

1-4 Installing Matlab on Mac or PC
Setting up your own copy of the genotype model

4pm Critique Today's Material

Tuesday, July 20

Dr. Michael Haney, STEP's Program Officer at NSF, will visit. (mhaney@nsf.gov)

8 am Graphics using the Matlab environment

9 am Nonlinear data fitting example using Matlab

10 am Break

10:15 Discuss how you might modify the genotype model

noon Lunch

1-4 Afternoon Lab
Implement changes in the genotype model

4pm Critique

Wednesday, July 21

8 am More on the Matlab programming environment

9 am Solving a differential equation (Deterministic Model)

10 am Break

10:15 Rabbits and foxes model of population dynamics

11:15 Chemistry model using reaction rate laws

noon Lunch

1-4 Discussion groups by **SIG**
How to plan a computational example?
How to present in classroom? (LCD screen?)

4pm Critique

Thursday, July 22

8 am What is a computational science tool?
What is the price of alternate tools?

9 am Run Matlab on Sun Sparc and compare the performance with the Macintosh.

10 Break
10:15 What is the cost of alternate hardware?

11 Is it the hardware or software?
HyperChem software on a SGI Indigo

noon Lunch

1-2 Demonstration of **HyperChem** on IBM/PC with VGA Terminal/LCD Panel and SGI Indigo.

2-4 Center for Clouds, Chemistry and Climate
(Scripps Institution of Oceanography)

John del Corral, "The Basics of a Global Climate Model"
Steve Sherwood, "Using a General Circulation Model to Access Cloud Radiative Effects
Erwin Boer, "3D Clouds with Supercomputers"

Greg McFarquhar, "The Similarities Between Clouds and Glasses of Sprite"

4pm Critique

Friday, July 23

8 am	How to share software using email? How to get Matlab examples using gopher?
9 am	What can be done with a spreadsheet?
10	**Break**
10:15	Continue with spreadsheet and the books: Dynamic Models in Chemistry pub. N. Simonson Dynamic Models in Physics pub. N. Simonson
noon	**Lunch**
1pm	Use Matlab to make a color postscript graphic and get hard copy
1:30-4	Work with spreadsheet or Matlab by SIG
4pm	Critique the tools for computational science. How do they fit into the high school classroom?

Monday, July 26 Current Work in Computational Science

8 am Michael Robertson, SDSC Consultant
(robertso@sdsc.edu)
Introduction to Desktop Publishing

9 am Dr. Rozeanne Steckler, SDSC
(steckler@sdsc.edu)
Undergrad. Course in Computational Chemistry
using **Hyperchem** on SGI Indigo

10 am Break

10:15 Dr. Michael Bailey, SDSC
(mjb@sdsc.edu)
Undergrad. Course in Computer Graphics

noon Lunch

1-2:30 Afternoon Exercise - write a Newsletter for
your high school principal describing what
was done in the STEP workshop.
Include color graphic from Friday afternoon

2:30-4 Investigate Undergraduate Curriculum in Supercomputing
(CS 575 at SDSU) gopher ucssun1.sdsu.edu /pub/sdscinfo

4 Critique

Tuesday, July 27

8-10 Mr. Robs Muir, Claremont High School
(rmuir@chs.cusd.claremont.edu)
Experiences setting up a high school program

10 am Break
10:15 Mr. Robs Muir continues

11 Introduction to the Cray (Stewart)
Vector Registers
Pipelined Arithmetic
Multiple Processors

noon Lunch

1-3 Afternoon Exercise - write a Newsletter to critique
STEP

3-4	Key ideas will be reviewed by Lead Teachers with their Study groups
4	Discussions

Wednesday, July 28

8 am Susan Calcari, CERFNet
(calcaris@cerf.net)
What CERFNet can do for you?

10 Break

10:15 Introduction to the Intel Paragon
Ken Steube, SDSC (steube@sdsc.edu)

noon Lunch

1-3 Afternoon Exercise - separate into SIGs to work with Matlab models

3-4 How can we apply CERFNet to the classroom?
Lead Teachers "lead" a Cerf'n Safari

4pm Critique

Thursday, July 29

Dr. Karen Cohen, MIT, is the outside evaluator for STEP and will visit (kccohen@athena.mit.edu)

8 am Dr. Jerry Greenberg, SDSC Chemist (jpg@sdsc.edu)
Research in Computational Chemistry at SDSC

9 am Dr. Peter Taylor, SDSC Chemist (taylor@sdsc.edu)
Research in Materials Science at SDSC

10 Break

10:15 Pat Sumi and Rick Rule
Ideas on how to go about **fund raising** and the sources of possible funds

noon Lunch

1-3 Discussions for next year
Work on newsletters/spreadsheet/matlab

3-4 Lead Teachers assess where their teams are in terms of the skills:
- Matlab
- Spreadsheet
- CERFNet
- Gopher

Email
Others?

4pm Critique

Friday, July 30

Dr. Karen Cohen, MIT, will visit STEP

8 am Readminister STEP Survey

9 am Round Table Discussion
The High School Curriculum
- what is applicable?
- what can SDSC do for you?
- what can CERFNet do for you?
- what are your individual needs?
- what are the needs of your students?
- what are the needs of your school?