

INTRODUCTION TO NATURAL SCIENCE
FALL QUARTER, 1978

time	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8:40 to 10:15	LECTURE I L. H. #1	LECTURE II L. H. #1	Tutor for Math/Phys	LECTURE III L. H. #1	LECTURE IV L. H. #1
10:30 to 12:00	CONCEPT SESSIONS A @ Physics L2204 B @ Math L2503 C @ Chem L3402	CONCEPT SESSIONS A @ Chem L2610 <i>Burt: Office hours</i> C @ Math L2614	Tutor for Chemistry	CONCEPT SESSIONS <i>Josie: Office hours</i> B @ Chem L2610 C @ Physics L2614	CONCEPT SESSIONS A @ Math L2614 B @ Physics L2610 <i>Michael: Office hours</i>
1:30 to ?	FACULTY SEMINAR <i>Does not involve students, but faculty are not available.</i>	LAB OR WORKSHOP ALPHA Lab II, 3223		STUDENT SEMINARS See seminar list for places.	LAB OR WORKSHOP BETA Lab II, 3223

NOTE: L. H. = Lecture Hall. L = Library Bldg. Lab II = Lab Bldg., Phase II
1st digit of a room number shows the floor, second digit designates an area

FACULTY MEMBERS:

- Dr. Michael Beug, coordinator. B.S. (Chemistry), Harvey Mudd College, 1966;
Ph.D. (Chemistry), University of Washington, 1971. Lab 2010, 866-6086.
- Dr. Burton Guttman. B. A. (interdisciplinary), University of Minnesota, 1958;
Ph.D. (Biology), University of Oregon, 1963. Lab 3014, 866-6731.
- Dr. Hazel Jo Reed. B. A. (Mathematics), Reed College, 1960; M.S. and Ph.D.
(Mathematics), Carnegie-Mellon University, 1967. Lab 2003, 866-6086.
- Dr. Niels Skov. B.S. (Mechanical Engineering), Teknikum (Copenhagen), 1947;
M. S. (1965) and Ph.D. (Physical Oceanography), Oregon State University, 1968.
Lab 3022, 866-6053.

BOOK LIST

- E. S. Abers and C. F. Kennel, *Matter in Motion*
L. P. Runyan, *Precalculus Mathematics with Elementary Functions*
R. E. Dickerson and I. Geis, *Chemistry, Matter and the Universe*
B. Brecht, *Galileo*
N. R. Hanson, *Patterns of Discovery*
S. Toulmin, *Foresight and Understanding*
H. Curie, *Nadame Curie*
W. H. Eisenberg, *Physics and Beyond*

INTRODUCTION TO NATURAL SCIENCE, FALL 1978

Week	Lectures				Seminar	Workshop/Lab
	I: Monday	II: Tuesday	III: Thursday	IV: Friday		
1 Oct. 2-6	Math: Egyptian, Babylonian systems	M in M, Chap. 1: Movement of the heavens	Math	CM&U, Chaps. 1 and 2: Isotopes, moles, gas laws	PROGRAM POTLUCK	(Time devoted to individual conferences.)
2 Oct. 9-13	M in M, Chap. 2: Greek cosmos, beginnings of science	CM&U, Chap. 2: Isotopes, moles, gas laws	Math	CM&U, Chap. 3: Li to Me	Brecht: Galileo	Measurement experiments
3 Oct. 16-20	M in M, Chap. 3 and 4	CM&U, Chap. 4: Bonding, bases, covalent bonds	Math	CM&U, Chap. 5: Ions, acids, bases, metals	M & M, Chap. 4 and 5	Lab: Weight, volume, density, MW from gas laws
4 Oct. 23-27	HOLIDAY	M in M, Chap. 5: Galileo	Math	M in M, Chap. 6: Newton	Toulmin: <i>Foresight & Understanding</i>	Laws of motion
5 Oct 30 - Nov. 3		CM&U, Chap. 6: Periodicity: Na to Ar	Math	M in M, Chap. 6: Newton	Hanson: <i>Patterns of Discovery</i>	Titration: Vitamin C in foods
6 Nov. 6-10	M in M, Chap. 7: Light	CM&U, Chap. 7: Particles, waves, paradoxes, quantum mech.	Math	CM&U, Chap. 8: Orbitals & periodic table	Hanson: <i>Patterns of Discovery</i>	Wave motion
7 Nov. 13-17		CM&U, Chap. 10: Periodic table	Math	CM&U, Chap. 11: Conservation, nuclear chem	Curie: <i>Madame Curie</i>	Chem or Bio Lab
8 Nov. 18-24	M in M, Chap. 9: Einstein		THANKSGIVING	NO VACATION	NO SEMINAR	
9 Nov. 27 - Dec. 1	M in M, Chap. 8: Electricity & magnetism	CM&U, Chap. 12: Enthalpy	Math	CM&U, Chap. 13: Entropy	Heisenberg: <i>Physics and Beyond</i>	Chem or Bio Lab
10 Dec. 4-8		CM&U, Chap. 14: Equilibrium	Math	Final Exams	REVIEW SESSIONS--- NO SEMINAR	

MONDAY, 2 OCTOBER

TUESDAY, 3 OCTOBER

THURSDAY, 5 OCTOBER

FRIDAY, 6 OCTOBER

8:40, L. H. #1: The whole crew gives you greetings, introductions, announcements, and kind words.

8:40, L. H. #1:

Niels Skov on the beginnings. (Of what? Come and listen.)

9:40, L. H. #1:

Josie Reed on trigonometry.

8:40, L. H. #1:

Michael Beug on the elements of chemistry. (Intentional pun)

10:00 (or whenever), LH #1:

Josie Reed on Egyptians, Babylonians, and right triangles.

10:30 Special workshops

L2610: Burt Guttman on the metric system or what you will.

L2614: Josie Reed on arithmetic, algebra, or what you will.

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1:30. Special short meetings of all seminars. See seminar list for place.

Short individual conferences for remainder of afternoon; schedule with seminar leader.

Short individual conferences scheduled all afternoon; scheduling with seminar leader.

PROGRAM

POTLUCK

Arrangements to be made

Time, if needed, for more individual conferences and program fine tuning.

INTRODUCTION TO NATURAL SCIENCE SEMINARS

Michael Baug (Library 3234)

Tricia Abel
 Joyce Armstrong
 Janet Bates
 Timothy Blair
 Linda Brownell
 Curtis Demaris
 Kay Fassler
 William Fiorilli
 Kathy Gilliland
 Jeff Hardesty
 Christina Jallings
 Laura Kittle
 Joseph Lewis
 Deed McCollum
 Joseph McGuire
 Lawrence Olsen
 James Parks
 Sheila Redmond-Payne
 Elizabeth Schy
 Sherry Smith
 Mindy Steiner
 Nancy Thompson
 Kendra Wagner
 Kirk Webster

Burt Guttman (Library 2610)

Kimberly Agnew
 Glenn Baldwin
 Shelly Baxter
 Larry Canfield
 Edward Chalfa
 Guy Diamond
 Patricia Dillingham
 Rick Fernald
 John Gardner
 Peter Goldstone
 James Herman
 Michelle Jones
 Gregory King
 Laura Little
 James Matthews
 Marcia Meyers
 Lyn Mitchell
 Lisa Parrish
 Daphne Pleasanton
 William Scurlock
 Cameo Smot
 Edward Storti
 David Thornton
 Warren Waldorf
 Jennifer Wezenberg

Josie Reed (Library 2614)

Amy Anderson
 Tim Barron
 J. Daniel Beckett
 Rick Cherry
 Vera Chotzen
 Eric Dott
 Kevin Ferris-Hanson
 James Garnett
 Karen Greene
 Hugh Hunting
 Matthew John
 Peggy Klein
 Denise MacNeil
 Douglas McGregor
 Steven Miller
 Chris Olten
 Marie Paul
 Michele Roedel
 Melodie Schneider
 Mark Soukup
 Nancy Swenbolt
 Theresa Ulich
 Joel Walker
 Michael Wils

Niels Skov (Lab II, 3rd floor south lounge)

Douglas Anderson
 Susan Bartlett
 Franklin Bjorseth
 Ian Conway
 Vincent Dawkins
 Conrad Driscoll
 Deborah Finch
 Janet Gillespie
 Ann Gutjahr
 Heide Horeth
 Diana Kincaid
 Robin Laakso
 Peter Martin
 Patricia Meldrich
 Charles Nelson
 Jan Panter
 Lesley Pfeifer
 Lisa Rhodes
 Jeff Shalla
 Nartha Spier
 Barbara Thacker
 Jeanne Vanderiet
 Terry Watness
 Wendy Wood

DEVIATIONS FROM THE NORMAL PROGRAM WORK

A number of students in INS will not be doing all of the standard work during the fall quarter because they have already had the general chemistry, or the math, or some other part of the program. If you fall into this category, you must follow certain rules. After you have read them, and assuming you agree to them, fill out the slip at the bottom of this sheet and give it to your seminar leader at your first conference.

RULES:

1) In general, we assume you will be doing three out of the four units of work for fall quarter, and we assume that one of those units will be the core seminar that deals with broader issues in and around science. We consider this to be an essential component of the program, in keeping with the Evergreen philosophy that your education should be as broad and interdisciplinary as possible. Any deviation from this rule requires special permission from your seminar leader.

2) Each week, you should pick up copies of assignments and representative problems in the subject you are not going to study with us. You should look over the assigned topics in the textbook and try to solve some of the problems. In this way, you should prove to yourself that you really do know the subject you are excused from, so you will not be behind in the winter quarter when you have to know that subject as a prerequisite to other work. If the assigned program work takes up topics you have not studied or are unsure of, you should study them just like any other student. In summary, at the end of the quarter you should know just as much as everyone else.

3) You will be asked to prove that you really do know the subject you are excused from by taking an exam at the end of the quarter.

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TO MY SEMINAR LEADER:

Dear

The part of INS that I expect to not study fall quarter is

As a substitute, I will be studying

I understand all of the above rules and agree to them.

Love and kisses,

SOME GUIDELINES FOR WRITING

While the development of writing facility is not one of our primary goals in this program, we are going to ask everyone to do quite a bit of writing as a way of developing an understanding of some topics that may not be easy to understand otherwise. We believe every student should come up to a minimal level of writing by the end of the year and should develop the ability to use writing for clarifying his/her ideas.

Students often say, "I know what I mean but I just can't say it." We don't believe it. A wise man said, in contrast, "How can I know what I think until I hear what I have to say?" One of the primary purposes of writing is to help you hear what you have to say and decide whether you believe what you hear. In the developing of rational knowledge, there appears to be a primitive stage in which one has a kind of intuitive understanding, but this is not the kind of knowledge one can work with. (There are, of course, some things that one understands only intuitively, but we aren't talking about those.) For one thing it often turns out that the intuitive understanding is wrong or incomplete; it is very easy to have a feeling of understanding which turns out, on analysis, to be misleading. It is easy to feel that you know what you mean when you actually don't know. One of the best ways to find out what your intuition says is to write--to make your thoughts explicit and then think about them.

Writing is generally at least a two-stage process, and it may require more than two stages. In the first stage you are a rather naive writer; you put on your writing hat and, using your favorite writing instrument, you write and write and write, just to get something down in black and white that expresses what is inside you. You must not worry much about the form of the writing; try not to be inhibited by thoughts about sentence structure, punctuation and spelling of words that are hard for you. Your only goal is to produce something, and no one but you will read it.

In the second stage you are an editor. You put on your editor's hat, pick up a red pencil, and start to attack what you've written. Pretend you don't even know who wrote the stuff in front of you, so you can attack it mercilessly. "What kind of nonsense is this?" Slash! "That contradicts itself!" Slash! "That's not a complete sentence!" Fix it. "That's misspelled!" Look it up. "Now that's a good thought, but the darn fool doesn't develop it!" Develop it.

The first stage of your writing, then, produced some rough material that you could work on. The second stage is the development of that rough stuff into a reasonably intelligible bit of writing. Now you have some idea of what thoughts you had; you have decided that some of them were incomplete or wrong, while others made sense and were worth developing. Now what you probably want to do is to take your original paper, with all its bright red slashings and corrections, and put it in better order. You may have decided that an idea buried in the third paragraph was really the most important thing you have to say, so you pull it out and make it the subject of your first paragraph. It sometimes helps to put little circled numbers--find another color of ink!--next to your sentences or clauses in the order you now think they belong.

And so you rewrite from your marked-up copy, and what you produce now will probably be a good first draft that you could give your seminar leader or have someone else read. You may not be happy with it yet, and if you have the time you may want to write all or part of it again. But at least that first draft will be respectable and will represent some real thought and work on your part. It will represent what you really think about a subject.

Now it may be discouraging to think that you have to go through all that just to get a first draft. We have purposely painted a somewhat extreme picture, and in fact what you write at first may be quite near to what you finally hand in. The closer you come to being a professional writer, the more your initial version will be your final version, although there are different styles even among professionals. There are some professional writers (of a kind that few of us would care to be) who have to produce, for example, a new script for a television program every day. They have little time to rewrite, and what comes out of their typewriters initially must be essentially the final copy. As you get better at writing and as you do more of it, you will find your editor's eye looking over your writer's shoulder continually, fixing sentences and analyzing thoughts as they come out the first time, so you have to do less and less rewriting. But the only way to reach this stage is to write and write and write. As you write, you will come to know yourself--to know what kinds of thoughts are in your mind and how you can best express them. You will get in touch with your own ideas and feelings. You will develop a more consistent set of attitudes and a certain intellectual integrity; integrity basically means "wholeness," and you will develop a personal wholeness, in which you know your own mind, have sorted out your basic ideas and attitudes, and have an intellectual foundation from which to develop new ideas and new understandings. This is the major reason we emphasize writing. It lies very much at the heart of academic activity.

We will try to help you by pointing out what you are doing well and what needs improvement. We expect you to hand in assigned papers on time and we will do everything possible to get them back to you with little delay. We certainly understand excuses such as illness, but in general we expect to receive papers by a certain deadline because we will have made out our work schedules with times for reading those papers, and if you hand yours in late you will be cutting into time allotted for other work. This isn't fair to us or the other students in the program.

We must be able to read papers. We don't have time to work out crabbed, sloppy handwriting. In general, we expect papers to be typed, although some of us will accept handwritten work that uses a clear, print-like script. (Typical public-school cursive is not legible.) Your seminar leader will explain his/her requirements. Papers don't have to be beautiful, just clear; words that are crossed out cleanly are perfectly acceptable, as are small typographical corrections. But if you have to make major changes on a page, please rewrite it. You should use 8½ x 11 paper, with margins of at least one inch all around. Typing should be double-spaced and writing or printing must leave plenty of space between lines for corrections.

Your best general guide for writing is Kate L. Turabian's Student's Guide for Writing College Papers (Univ. of Chicago Press). You can buy a copy in the bookstore.

Some HELP for those who want to brush up on math

- I. In the bookstore in the next day or so there will be some self-paced learning booklets by Burt; they're on fractions and signed numbers, the metric system, exponents.
- II. In Lab I and Lab II there are the SPLU labs--self paced learning labs. They contain a number of useful things.
- i) Under the section called math there are diagnostic tests (to be picked up from one of the aides or Bob Barnard) which will indicate to you which of the several tape-booklet sets will be most applicable to your needs. If you find some set useful, you can bring a blank tape of your own and have a duplicate tape made for you to use at home; the booklets can be Xeroxed for home use. Otherwise the aides can show you how to use them in the labs.
 - ii) Under chemistry there are also booklet-tape combinations covering things like significant digits, solving simple equations, and the like.
 - iii) There are computer terminals. Near each is a large sheaf (box?) of descriptive materials which can be gotten on those terminals.
To use the terminals, you will need to get a number from Computer Services (Library 2415). You should also get the booklet The Care and Feeding of the Complete Computer from Bob Barnard to learn how to run the terminals.
 - iv) There are a few copies of Burt's self-paced materials in the math section in SPLU.
- III. In a day or so there will be a file of useful materials on the PLATO system. To find out how to use the PLATO terminals, either talk to the SPLU staff or Computer Services staff. There will be terminals in the PLU lab and in Computer Services.
- IV. In Runyan there are a few sections which might help: 1.4, 1.6, 1.8.
- V. We will have sessions next week for help. More about that Monday.

This week only!

SPLU's open

1-5