

HAMPSHIRE COLLEGE

Supplement to Course Bulletin, Fall 1971

The following changes have been made in the course offerings for fall, 1971. Please check this listing carefully before registering for any courses.

HUMANITIES AND ARTS:

HA 195, Dimensions of Consciousness - John Boettiger

Substitute the following description:

The course will be designed as an experimental workshop to better understand some of the varieties of conscious experience to which men and women are led in their search for personal growth. Selections and emphases among various disciplines* cannot be precast, but the methods and realms of inquiry from which the workshop will draw include:

- * encounter and human relations training
- * approaches to imagination, dream and fantasy experience, and play
- * still and moving meditation
- * sensory awakening
- * body structure, images and movement, and their connections with the sense of self
- * mythmaking, ritual, and religious experience

(* It should be clear from such a list that "discipline" is here intended as something more akin to the Sanskrit term Sadhana -- a liberating discipline pursued for the sake of the individual's spiritual development -- than to the conventional academic sense.)

The course will move toward a synthesis of experiential, reflective, and analytic modes of work, with individual projects, small groups of two to six, and larger seminar sessions, directed at a better realization of the ways of human growth: freeing creative energies and exploring the potentialities of self-expression. In addition to regular meetings throughout the term, one or two longer weekend sessions will be planned.

This seminar is offered within the Human Development Program. See page 7 of course description booklet.

Additions:

HA 132, Workshop in Human Consciousness - John Boettiger

An opportunity for selective and intensive engagement with one or more of the disciplines of personal growth. Critical exploration of the literature; discussion and experiential work in small groups of two to four people and in the larger workshop; practicum experience in designing and leading sessions and short-term workshops in various Hampshire (and perhaps wider) community settings. Some sense of possible areas of project work may be gleaned from the Dimensions of Consciousness description (HA 195).

While the whole group will meet weekly for some explorations-in-common and to share

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individual work in progress, the larger emphasis will be upon individual and small group collaborative projects. Thus several different projects will be in course at any given time, and an individual member of the workshop will design his or her own project sequence in consultation with me and perhaps one or two others with whom a given project is being undertaken.

Interested students should consult with me before the end of the registration period.

HA 192, Western Ideas and Institutions - James Haden

By now many students may have discovered that courses that deal with current ideas and problems presuppose an acquaintance with the past. That is one good reason for getting an introduction to the development of the social ideas and institutions of the Western world. A still better reason is that it is intrinsically interesting material and is part of the knowledge of any literate and cultured Western person.

This course is intended as such an introduction, dealing only with the interplay of ideas and events from the classical Greek period to the Renaissance. It is history seen from the standpoint of the history of ideas of various sorts -- philosophical, political, religious, economic -- as they have been interwoven.

All the required reading will be from original source materials, in the form of a sizeable series of fairly short selections taken in chronological order. One of the available good collections of such materials will form the basic text.

NATURAL SCIENCE AND MATHEMATICS:

Perspectives in Experimental Science - (see page 55 of course booklet for general description of these modular courses.) Please note, however, that there will be no core lectures for this course.

The first four month-long modules will be:

- | | |
|--------|---------------------------------|
| NS 142 | Experimental Mathematics |
| NS 165 | Structure and Solubility |
| NS 175 | Why the Sky is Blue |
| NS 180 | Observational Optical Astronomy |

Students enrolling in PES should enroll in one of these four courses; later modules may be chosen at a later time.

Three new modules in the PES course:

NS 177, Informational Macromolecules - Lynn Miller

Being a consideration of our present knowledge of the biological macromolecules, especially deoxyribonucleic acids. Discussion will center on the Predogmatic development of our present knowledge and continue to the Postdogmatic (or Depressive) era.

Every attempt will be made to explore the elegance of the informational theories and to demonstrate the evolutionary stability of biological codes without contaminating the minds of the participants with Beliefs in the Fixity or Truth of Physicochemicobiological Theorems. As E. C. Large pointed out in 1940: "The study of heredity had its attractions for its own sake: it involved everything from genes to the will of God,

and it was not for nothing that men of leisured culture called it the Queen of Sciences."

NS 132, Imaginary Numbers in the Real World - David Kelly

The story of how mathematicians, in an attempt to extend the class of numbers, produced an essential tool for handling things like forces, waves, electrical circuits and the behavior of atoms. Thus we discover that numbers like the square roots of negative one, far from being "imaginary," are built firmly into our descriptions of reality.

NS 142, Experimental Mathematics - David Kelly

We shall explore problems in several parts of mathematics, old and new, in the hope of discovering and examining conjectures which arise from constructions, computations, natural phenomena, plausible reasoning, and good luck.

Additions:

NS 147, Fresh Water Biology - Merle Bruno

Everyone wants clean water, but what does it mean? Can it contain algae, bacteria, worms, fish? Does it smell? Are all clean ponds and rivers essentially the same? Is clean water blue, green, brown or clear? When do we call water polluted? How can a river or lake die? These questions are difficult to answer, and the answers are unexpected. The class will visit local streams and ponds, collect data, analyze samples, and develop a set of detailed individual problems.

NS 152, Science Teaching - Merle Bruno

For students interested in exploring methods of teaching science through laboratory and field investigations. The course begins with material developed for the Elementary Science Study project, forming a basis for examining the special set of problems connected with the teaching of science to pupils and teachers in the elementary schools. Students will develop their own views, defend them to the class, and test them with young people in the Early Identification Program.

NS 190, The Future of Technological Civilization - David Parker

Just as the understanding of the nature of matter and radiation gave man god-like control over his environment, so the understanding of the chemical basis of living systems will give him control over his own biology. We are already beginning to feel the impact of biological technology in our personal lives, through the mechanization of the body in modern medicine and the epidemic use of psychoactive drugs. But ground is barely broken in the possible application of our growing knowledge of the chemical nature of the gene, the control of gene expression, and the regulatory systems of higher organisms.

In this course, members of the class will project themselves into a future of human genetic engineering, where one has direct chemical and electrical control of the mind, and

where lifetimes are measured in centuries for those wealthy or powerful enough to have access to interchangeable human parts and to chemical interference with the aging process. We shall ask whether these apparently inevitable technological advances are compatible with our understanding of what is good in life. We shall also discuss the possible outcomes of our runaway technology: a totalitarian world system in the model of Brave New World; the eventual triumph of laissez-faire as we become aware enough of disaster to prevent it; or a breakdown of objective consciousness and a turning away from the materialist ideology.

NS 187, Science and Public Policy - A Discussion Course - Herbert Bernstein

An intelligent response to many current issues requires an indispensable minimum of scientific understanding. It should be a goal of every Hampshire College member to understand enough science to follow the public policy debates that our society generates. Participants in this course will help select a few topics of current importance, investigate briefly their scientific basis, and discuss the issues involved. In conjunction with the course, the Thursday night lecture series on Science and Public Policy will present leading scientists from other institutions who have been invited to Hampshire to share their views.

Some proposed areas for discussion in the course are:

- * the energy crisis of the USA
- * SALT talks, ABM and strategic policy
- * SST, sonic boom and public good
- * manned space travel

NS 197, Air Pollution and Lasers - Herbert Bernstein

A seminar-workshop wherein we learn

- (1) What makes and constitutes air pollution,
- (2) What makes a LASER tick, and
- (3) How the latter might be applied to locating and measuring the former.

The students (and professor) will study the theory and application of air pollution detection and monitoring by lasers. We will investigate various mechanisms such as holograms, fluorescence and Mie scattering, and then determine how they may be used in combating air pollution.

New Description: Division II

NS 205, De Rerum Natura (see page 65 of course description booklet for general description)

The following general lecture topics will be covered in the course:

- (1) Discovery of microbes and the spontaneous generation controversy
- (2) Life without air: The cause of the alcoholic fermentation
- (3) The role of microbes in nature
- (4) The way organisms make a living
- (5) Bioenergetics and the way organisms make a living
- (6) Enzymes

7. On matters of growth
8. The microbes' contribution to ecology
9. Viruses and genes
10. Germ-free life
11. The immune phenomenon
12. Disease as an ecological phenomenon
13. The cancer problem
14. The origins of eukaryotic cells

Within the course, the following units of work (four week minicourses) will be offered. Students should enroll in NS 205; particular units can be decided at a later date.

SELF AND NOT-SELF

The body can recognize and mount an immune response against virtually any foreign substance, be it a protein, a microbe, or a transplanted organ. The agents of recognition are proteins called antibodies, which the body produces in large quantities in response to foreign substances to direct the destructive potential of the rest of the immune system.

In this course, we will consider the following questions: How does the act of recognition take place? How does the body manage to distinguish between its own complex structures and everything else, and so avoid destroying itself with its own immune system? How are antibodies made? Is the information for the distinction between self and not-self inherited from previous generation, or does each individual body have to learn the difference? What are allergies? How does vaccination protect against infection? Why are organ transplants rejected? Besides protection against infectious disease, what role might the immune system play in cancer? In aging?

ENZYMES, BASIC UNITS OF BIOLOGICAL FUNCTION:

There is very little going on inside living cells that is not enzyme-catalyzed. This course will examine enzymes in the laboratory, where we can see them in action. With some simple assay techniques one can look for an enzyme in various tissues, study its distribution in the cell and observe the effects of environmental factors on its activity. For the purist there will be crystalline enzyme handy and some computer programs to model their activity.

Enzymes have unique properties largely because they are proteins. We should therefore look at how proteins are put together and how this relates to the behavior of an enzyme. If students are interested they can try isolating their favorite enzyme from some suitable source, a project which brings together the fact that an enzyme is both a catalyst and a protein.

Finally, we will look at how enzymes interact with one another and at their environment inside the cell. One can learn a lot from studying a single enzyme, but it is the properties of systems of enzymes that make biological material unique.

PRODUCTION AND UTILIZATION OF BIOLOGICAL ENERGY:

Three major systems produce the energy cells used to carry out their functions -- fermentation, respiration and photosynthesis. It is a simple matter to separate them from cells and examine each independently in the laboratory. This examination will touch on a number of important biological ideas:

- * the release, capture and use of free energy
- * the concept of "energy currency" in biological systems
- * equilibrium, work and the laws of thermodynamics
- * the integration of cell structure and enzyme function
- * a couple of major unsolved problems in biology

It will involve learning some techniques:

- * breaking open cells and fractionating their contents
- * use of the respirometer and oxygen electrode
- * enzymatic and spectrophotometric assays for important metabolites like inorganic phosphate and ATP
- * radioactive tracer technique

THE LIVES OF YEASTS:

Being an investigation into their history (~~that~~ little we know of), their nature, activities, and relations to mankind (*Homo sapiens faber*).

The following letter to the editor of the Chemistry and Industry (1963, p. 481) sufficiently introduces the subject matter: "La Fermentation"*

Sir, --

There's yeasts in ~~meat~~age and yeasts in ham,
Yeasts in honey and strawberry jam,
But none of these media can compare
With the consequence de la vie sans air.

There's yeasts in bottles and yeasts in flasks,
Yeasts in barrels and yeasts in casks.
We've beer in plenty and beer to spare
As a consequence de la vie sans air.

There's yeasts imperfect and yeasts with spores
(Hats and needles in two and fours),
Celibate yeasts, and yeasts that pair
As a consequence de la vie sans air.

pp.
There's shadowy yeasts, both pink and white--
And I have a yeast that is black as night--
But colour isn't as grave an affair
As the consequence de la vie sans air.
adagio

I think in terms (when I think at all)
That are saccharomy--cetological;
But I've reached the stage when I don't much care
As a consequence de la vie...la vie sans air!

Yours, faithfully,

Ralph A. Lewin

University of California
Scripps Institution of Oceanography,
La Jolla, California

*Having seen an announcement that an International Symposium on Fermentation was to be held, Dr. R. A. Lewin submitted the above poem--Editor.

BEANBAG GENETICS:

The early students of genetics (before the subject had that name) knew little or no mathematics, Gregor Mendel and Francis Galton being the exceptions. Nonetheless these men discovered or devised most of the mathematical rules of the game that some people now call the Laws of Heredity.

In fact, Titus Lucretius Carus (De Rerum Natura IV:l. 1220) gave the first known non-mathematical statement of the rules:

... The cause of this
Lies in the fact that hidden in all bodies
Are many first-beginnings, primal moles
Passed on by the successive generations,
And out of these the goddess fashions forms
Whose lot is various, on a child bestows
Ancestral traits of voice, complexion, hair.
Sons may be like their mothers, and the girls
More like their fathers; this is natural
Since all things born are made from double seed,
Although in mixed proportion; this is clear
Whatever the sex of the new generation.

translated by Rolfe Humphries

Lucretius: The Way Things Are
(Indiana University Press, Bloomington, 1963)

We shall attempt to trace the development of these ideas from our perspective today. Some of the outcomes of these activities will be, hopefully, to discover the usefulness of some simple mathematical tools, to learn to read some of the literature of beanbag genetics, and to speculate on the genetic future.

The laboratory work in this course will be games in elementary probability or similar but more complex games with sugar moulds, black bellied dew lovers, or bacteria eaters.

SOCIAL BEHAVIOR:

This module will explore the biological aspects of populations and social animals.

SOCIAL SCIENCE:

Deletion:

SS 205, Comparative Authoritarian Government - Gayle Hollander - has been dropped.

Additions:

SS 117, Politics of Education - Richard Alpert

Education and politics have most often been thought of as antithetical activities. But, more and more, the two are being recognized as very much involved with each other. School board and tax elections, the relationship of the school board to the school administration and the community, the role of unions, and the issues of decentralization and community control all point sharply to the intimate connections of political processes with the structure and operation of the school system. The school system also affects the polity. Children are socialized and educated into and about politics. The school system is a primary instrument for the transference of political myths and loyalties, and for general citizenship training.

This course will explore and analyze the kind of politics and political functions that surround the public schools. The readings will be varied -- drawing both from scholarly works and journalistic accounts. Students will also be asked to draw on their own school experiences to breathe more life into and add new insight to the readings. The course will be of a lecture -- discussion type -- sometimes I will talk a lot, other times very little. If possible, field trips will be arranged to local school board meetings.

SS 150, Poverty and Inequality - Barbara Linden

This course will focus on theories about poverty. We will consider the following problems:

- * Are certain kinds of inequality necessary in a society?
- * How do social policies influence definitions of poverty?
- * How can the theories be evaluated and compared?
- * What are the basic assumptions about society in these theories?
- * What are the societal effects of poverty?

We will be discussing several policy proposals offered by social scientists and the social and political consequences of recent research on poverty.

Readings will be drawn from Lewis, Frazier, Edwards, Liebow, Moynihan, Coleman, Clark, Hacker, Suttles and others.

SS 185, Women in Theories about Society - Barbara Linden

In this course we will examine some of the basic theories and ideas about the structure of society to see how they relate to past and present views of women. We will study the kinds of explanations that exist for social stratification systems and how they are connected to cultural views of women; how previous definitions of women's roles have supported particular social orders; and the way in which equality and inequality of women in different cultures is tied to accepted political ideas. Class discussions will focus on both classical and current theories of social stratification, social movements and cross-cultural comparisons.

Readings will include selections from current writings on women, and works by Mill, Engels, Weber, Rousseau, Berger, Gusfield, and Heberle.

SS 101, Development of the Political Self - Gayle Hollander

See page 101 of course bulletin. Two sections of this course will be offered.

Revised description:

SS 160, Sociology of and for the Future - Ernst Borinski

The course is exploratory. It aims at developing a spectrum and multiple perspective of our contemporary society analyzed in The Industrial Sate by John Galbraith and functionally projected in Future Shock by Alvin Toffler. How can we comprehend the dynamics of our contemporary society and our place in it? Is man still the master of his socio-economic and existential destiny or has he become the victim of a technical and organizational mechanism?

Do we have to give up technology to retain human values, do we have to give up organization to maintain individual freedom, do we have to sacrifice nature to exist in our technological culture? The course is designed to respond to these alternatives and to help us to identify our commitment to ourselves, to the community of scholars, and above all to our human communities which we are called upon to build and to preserve.

Resource materials and field experiences will be utilized as the course proceeds.

LANGUAGE AND COMMUNICATION:

LC 201, The Elements of Formal Syntax, has been dropped.

One or two additional Division I seminars may be added later.

New Faculty Member: Maija Lillya, Visiting Assistant Professor in the Program of Language and Communication, received a B.A. from Kalamazoo College and an M.A. in linguistics from Radcliffe College under a Woodrow Wilson Fellowship. She is presently a candidate for a Ph.D. in linguistics at Harvard University where she also served as a teaching fellow. Her major area of interest is sociolinguistics with special emphasis on the problems of national language development and standardization.