

S. 74 - 146

SIMON FRASER UNIVERSITY

MEMORANDUM

To SENATE

From SENATE COMMITTEE ON UNDERGRADUATE STUDIES

Subject FACULTY OF INTERDISCIPLINARY STUDIES -
NEW COURSE PROPOSAL G.S. 201-3
HISTORICAL STUDIES IN THE PHILOSOPHY OF
SCIENCE.

Date November 12, 1974

MOTION 1:

"That Senate approve - and recommend approval to the Board - the new course proposal, as set forth in S74 - 146, for G.S. 201-3 Historical Studies in the Philosophy of Science for offering on a continuing basis until there is further proposal for courses in the History and Philosophy of Science at which time the course will be fully reviewed."

574-146

SIMON FRASER UNIVERSITY

MEMORANDUM

To SENATE

From SENATE COMMITTEE ON UNDERGRADUATE STUDIES

Subject

Date November 12, 1974

At its meeting of 5th November, the Senate Committee on Undergraduate Studies considered a proposal from the Faculty of Interdisciplinary Studies for the offering of a new course, GS.201-3: Historical Studies in the Philosophy of Science.

In response to questions about the apparently incomplete nature of the reading list for this course, the Dean of Interdisciplinary Studies stated that the proposal now being submitted was the product of discussions between the proponents of the course, the Faculty of Science and the Department of Philosophy. The original proposal had been modified along lines suggested by these two groups and the final version had met with their approval. The question was also raised concerning the relationship of this course to any future proposal in the History and Philosophy of Science. In response to this question, the Dean noted that, in approving this course, his Faculty had assumed that it would be offered on a continuing basis until such a program was initiated.

The Committees recommendation thus includes this proviso; and this course proposal is now forwarded to Senate for its consideration.

I. Mugridge
I. Mugridge

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SIMON FRASER UNIVERSITY

SCUS 74-44

MEMORANDUM

The Chairman,

From J. Blanchet,

Senate Committee on Undergraduate
Studies.

Secretary to the Faculty of Interdisciplinary
Studies Curriculum Committee.

Subject G.S. 201-3, Historical Studies in
the Philosophy of Science.

Date October 9/74.

New Course Proposal.

The attached new course proposal is forwarded to you for consideration by the Senate Committee on Undergraduate Studies. Would you please place this item on the agenda.

Attachment.

J. Blanchet

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: N/A

Abbreviation Code: GS Course Number: 201 Credit Hours: 3 Vector: 2-1-0

Title of Course: Historical Studies in the Philosophy of Science

Calendar Description of Course: This course will present some of the views held by important figures in the philosophy of science including Aristotle, Galileo Bacon, Descartes, Newton, Kant, Poincare, etc. The format will be primarily chronological and will culminate with a study of views held by leading figures in the late 19th and 20th centuries.

Nature of Course Lecture/Tutorial

Prerequisites (or special instructions): Any 100 level course in science, mathematics, or philosophy

What course (courses), if any, is being dropped from the calendar if this course is approved: None.

2. Scheduling

How frequently will the course be offered? Yearly

Semester in which the course will first be offered? Fall 1975

Which of your present faculty would be available to make the proposed offering possible?

3. Objectives of the Course

See attached

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas:

Faculty 1/4 sessional lectureship, on an annual basis

Staff

Library See attached resource list

Audio Visual

Space

Equipment

4. Approval

Date: October 9/74.

N/A
Department Chairman

[Signature]
Acting Dean

Chairman, SCUS

3. Objectives of the Course

a) The object of this course is to acquaint the student with important historical views in the philosophy of science. The format will be primarily chronological though reference to related contemporary ideas will be made throughout. Readings will be selected primarily from original philosophical writings though in some cases, Newton for example, scientific texts will be studied so that comparisons between actual practice and methodological accounts can be made. The following nine sections will be assigned approximately equal times (weighted in favour of the late 19th and early 20th centuries) from which it can be seen that the course will give an overall introductory picture rather than a detailed analysis of any particular philosophy.

Outline

1) Introduction to classical views

- a) Aristotle - the inductive-deductive method; non-logical requirements for scientific explanation.
- b) The pythagorean view of nature.
- c) The classical origins of the tradition of 'saving the appearances'.
- d) Euclid; deductive systems the model for empirical systems?

2) 16th and 17th century philosophy of science

- a) Anti-Aristotelian philosophies: the Hermetic, neo-platonist and magical world views.
- b) Galileo's version of Aristotelian methodology: his Platonic ideas of abstraction and idealisation in science.
- c) Francis Bacon; methods of induction and exclusion; crucial experiments. The rejection of teleological explanation.
- d) R. Descartes; the rationalist viewpoint: mechanical world views.

3) Newton

- a) Newton's account of his methods and of the structure of scientific theory.
- b) Newton's rules of reasoning.
- c) Interpretations of 'Hypotheses non-fingo'.
- d) Criticisms of Newton's account of science.

4) 18th century philosophy of science

- a) D. Hume; the principle of empiricism.
- b) I. Kant; the Kantian view of mathematics and of Newtonian mechanics.

5) Early 19th century philosophy of science; theories of scientific procedure

- a) J. Herschel; the continuation of the empirical tradition; the distinction between the discovery and justification of scientific theories.
- b) W. Whewell; the Kantian tradition; the philosophy of science based on historical studies.
- c) Naturphilosophie - the Divine plan of Nature: anti-materialism.

6) Inductivism; pro and con

- a) J.S. Mill; Inductivism.
- b) S. Jevons; the hypothetico deductive model for scientific explanation.
- c) C. Hempel; continuation of the deductive scheme.

7) Mid-Late 19th century philosophy of science

- a) Darwinism; its effect on the Platonic doctrines of ideal form and on Aristotelian final causes.
- b) Helmholtz; 19th century neo-Kantianism; the psychological school.
- c) E. Mach; sensationalism, conventionalism, the critique of Newtonian philosophy.
- d) K. Pearson; radical empiricism.
- e) P. Duhem; axiomatics; historical approaches to positivism; the conventionalist view.
- f) H. Poincare; the Kantian philosophy of arithmetic; the conventionalist philosophy of science and geometry.
- g) C. Pierce; indeterminism in physical theory; anti-inductionism.

8) Early 20th century views

- a) N.R. Campbell; analysis of science without reference to traditional philosophies; the roles of analogy and measurement in science.
- b) P.W. Bridgman; the influence of Duhem and Einstein; operationalism.
- c) Einstein's later neo-Kantian account of methodology in science.
- d) Planck's realism and Bohr's instrumentalism.
- e) J. Watson; behaviourism.
- f) Organismic arguments in Biology, Woodger and Haldane.
- g) H. Bergson's "creative evolution".

9) Mid 20th century views; a brief summary

- a) Modern empiricism; Kuhnian 'irrationality'; neo-Kantian philosophy.
- b) Problems of reduction in the physical and biological sciences; is quantum mechanics an anti-reductionist theory?
- c) Teleology and goal directed organization in biological systems.

Book List

Recommended

J. Kockelmans (ed.) *Philosophy of Science: The Historical Background.* (Collier Macmillan 1968)

J. Losee *A Historical Introduction to the Philosophy of Science.* (O.U.P. 1972)

Resource List for the Library

Aristotle *Posterior Analytics*

G. Mathews (ed.) *Plato's Epistemology* (Faber, 1972)

Ptolemy *The Almagest*

Galileo *Dialogue Concerning Two New Sciences* (H. Crew translation, 1950)

The Assayer (Stillman Drake ed.)

F. Bacon *New Organon*

R. Descartes *Discourse on Method*

Principia

I. Newton *Mathematical Principles of Natural Philosophy* (A Motte translation 1962 ed.)

Optics

D. Hume *An Enquiry Concerning Human Understanding; A. Flew (ed.) David Hume on Nature and the Understanding, Collier 1962*

I. Kant *Critique of Pure Reason* (Kemp Smith Trans)

Prolegomena and Metaphysical Foundations of Natural Science

J.F.W. Herschel *A Preliminary Discourse on the Study of Natural Philosophy* (1831) London, 1842.

W. Whewell *The Philosophy of the Inductive Sciences Founded Upon Their History.* London 1840.

or

The History of Scientific Ideas (1847)
Norum Organon Renovatum (1858)

On the Philosophy of Discovery (1860)

- J.S. Mill *A System of Logic*
- W.S. Jevons *The Principles of Science - Dover edition (1958) - with an introduction by E. Nagel*
- H. von Helmholtz *Popular Lectures on Scientific subjects (trans. E. Atkinson) Appleton Century Crofts (1881)*
- E. Mach *Popular Scientific Lectures (Chicago 1943)*
- The Science of Mechanics (trans. T.J. McCormack) (La Salle 1960)*
- K. Pearson *The Grammar of Science (London 1911)*
- P. Duhem *The Aim and Structure of Physical Theory (New Jersey 1954, trans. P.P. Wiener)*
- H. Poincare *Science and hypothesis (trans. W.J. Greenstreet) (N.Y. 1952)*
- The Value of Science (trans. B. Halsted) (N.Y. 1958)*
- Science and Method (trans. F. Maitland) (N.Y. 1958)*
- C. Pierce *Essays in the Philosophy of Science*
- N.R. Campbell *Foundations of Science. The Philosophy of Theory and Experiment (N.Y. 1957)*
- What is Science? (N.Y. 1952)*
- An Account of the Principles of Measurement and Calculation (N.Y. 1928)*
- P.W. Bridgeman *The Logic of Modern Physics (N.Y. 1927)*
- The Nature of Physical Theory (Princeton 1936)*
- The Nature of Some of Our Physical Concepts (N.Y. 1952)*
- S. Toulmin (ed.) *Physical Reality*
- N. Bohr *Atomic Physics and Human Knowledge*
- P. Schlipp (ed.) *A. Einstein - Philosopher Scientist*
- J.B. Watson *Behaviourism (1925)*
- J.H. Woodger *Biological Principles (1929)*
- J.S. Haldane *The Philosophical Basis of Biology (1931)*

SIMON FRASER UNIVERSITY

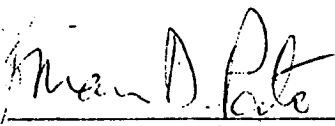
MEMORANDUM

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| To | Professor J.J. Weinkam, Chairman Faculty of Interdisciplinary Studies Undergraduate Curriculum Committee | From | B.D. Pate, Chairman Faculty of Science Undergraduate Curriculum Committee |
| Subject | General Studies 2XX - Historical Studies in the Philosophy of Science | Date | October 4, 1974 |

The Faculty of Science Undergraduate Curriculum Committee, in its meeting of October 1, 1974, met with Dr. H. Gay to complete its consideration of the above numbered course as requested by Ms. J. Blanchet in her memo of January 14, 1974.

Subsequent to that meeting I have had an opportunity to examine a draft proposal and outline for this course. I am happy to report that this draft incorporates the modifications which were agreed upon at the meeting between the Faculty Undergraduate Curriculum Committee and Dr. H. Gay.

I am pleased, therefore, to convey by this memo the endorsement of this course and its contents on behalf of the Undergraduate Curriculum Committee. We look forward to this course being offered at the earliest opportunity.


B.D. Pate

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cc: Members, Faculty of Science
Undergraduate Curriculum Committee

SIMON FRASER UNIVERSITY

MEMORANDUM

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|---------|--|------|--|
| To | Professor J. Weinkam, Curriculum Committee, Faculty of Interdisciplinary Studies | From | Norman Swartz, Chairman, Undergraduate Studies Committee, Department of Philosophy |
| Subject | Proposal for course in History of the Philosophy of Science | Date | March 14, 1974 |

The Chairman of this Department and I have carefully examined Dr. Hannah Gay's proposal (13th November) for a course entitled "Historical Figures in the Philosophy of Science". We are pleased to report that we find this proposal academically sound and an attractive complement to existing courses in the Department of Philosophy.

In due time, this Department may wish to sponsor a minor program in the History and Philosophy of Science. If we do, we shall of course then examine the question what, if any, role this particular course might play in that program. But since it is our understanding that courses given in Interdisciplinary Studies are approved only on a year-to-year basis, we do not envisage any conflict between this course's being given now and any proposals we might care to bring forth for such or related courses in the future. In the meantime, we would like to see the present course offered. Perhaps it might even be viewed as a preliminary testing of student interest in this field.


Norman Swartz

NMS/fw

c.c. Dr. L. Resnick, Chairman
Department of Philosophy