

SIMON FRASER UNIVERSITY

MEMORANDUM

S.82-87

To..... SENATE

From..... OFFICE OF THE DEAN OF GRADUATE STUDIES

Subject..... NEW GRADUATE COURSE PROPOSAL - BISC
854-3, Plant Pathosystems

Date..... July 7th, 1982

MOTION: That Senate approve and recommend approval
to the Board, as set forth in S.82-87 - New
Graduate Course Proposal - BISC 854-3, Plant
Pathosystems.

This course proposal was approved by the Executive
Committee of the Senate Graduate Studies Committee
on July 5th, 1982.

B.P. Beirne
Dean of Graduate Studies

/meb

attachs.

SIMON FRASER UNIVERSITY

New Graduate Course Proposal Form

CALENDAR INFORMATION:

Department: BIOLOGY Course Number: 8XX 854
Title: PLANT PATHOSYSTEMS
Description: Analysis of wild plant pathosystems in order to improve our management of crop pathosystems; with special emphasis on breeding for horizontal resistance to crop parasites.
Credit Hours: 3 Vector: B-0-0 Prerequisite(s) if any: NONE

ENROLLMENT AND SCHEDULING:

Estimated Enrollment: 10-20 When will the course first be offered: 83-1
How often will the course be offered: Once annually.

JUSTIFICATION:

Breeding plants for resistance to parasites is a major component to crop and forest pest management which is currently not being taught in the MPM Program.

RESOURCES:

Which Faculty member will normally teach the course: R. A. Robinson
What are the budgetary implications of mounting the course: NONE: existing library and Departmental facilities adequate.

Are there sufficient Library resources (append details): YES

Appended: a) Outline of the Course
b) An indication of the competence of the Faculty member to give the course.
c) Library resources Are already adequate.

Approved: Departmental Graduate Studies Committee: [Signature] Date: 18 June 1981
Faculty Graduate Studies Committee: G. A. C. Graham Date: July 27/81
Faculty: [Signature] Date: Jan 23/82
Senate Graduate Studies Committee: [Signature] Date: 7 July 82
Senate: _____ Date: _____

1. Systems:

Patterns; systems levels, Gestalt principle, suboptimisation. Structure and behaviour; control of behaviour, cybernetics, genetic code, behaviour patterns, behaviour strategies.

2. Ecosystems:

Boundaries; geographical, biological, conceptual. Evolution of behaviour; ESS. K-strategists cause endemics characterized by continuity in space and time; r-strategists cause epidemics characterized by discontinuity.

3. Pathosystems:

Subsystem of an ecosystem; parasitism. Plant pathosystems; wild, crop and weed pathosystems. Hosts as islands; migration to islands (allo-infection) and colonization of islands (auto-infection). Subsystems of pathosystems of pathosystems; vertical, horizontal, others.

4. Vertical Subsystem:

Vertical resistance. Gene-for-gene relationship, Person/Habgood differential interaction, control of exodemic only. Discontinuity in time and space; r-strategists and epidemics only. Host and key analogy. Models, examples.

5. Horizontal Subsystem:

Horizontal resistance. No gene-for-gene relationship, constant ranking; control of esodemic (auto-infection). Models; examples; permanence.

6. Wild Pathosystems:

Autonomous, balanced; ESS. Models of vertical and horizontal subsystems and their inter-relationships. Examples.

7. Crop Pathosystems:

Uniformity. Suboptimisation of vertical subsystem and within vertical subsystem. Boom and bust cycles. The influence of Mendel and Biffin. Gene-transfer methodologies and pedigree breeding. Examples. Weed pathosystems.

8. Pathosystem Management:

Vertical subsystem management. Horizontal subsystem management. Breeding plants for resistance which is permanent, complete and comprehensive.

9. Overview: The world food problem; cause and solution.

New Graduate Course Proposal: Plant Pathosystems - BISC 854

Appendix:

- a) **Outline of the course:** The systems concept; ecosystems; plant pathosystems; vertical and horizontal subsystems; models of wild pathosystems and their subsystems; the crop pathosystem; breeding for horizontal resistance to crop and forest parasites; breeding of perennial hosts; breeding of annual hosts; world food production and the world food problem.
- b) **Competence:** The faculty member is author of a book entitled "Plant Pathosystems" and the course is based on this book.
- c) **Library resources:** Already adequate.