# SIMON FRASER UNIVERSITY <br> MEMORANDUM 

5.453


The attached new course proposals from the Department of Mathematics were passed by Faculty at its meeting on November 19, 1970.

I enclose them for submission to the December meeting of Senate.


# SIMON FRASER UNIVERSITY <br> MEMORANDUM 



From.... Dr. D. L. Sharma
Mathematics Department
Date..... November 9, 1970

I wish to point out that the attached proposals for new courses in applied mathematics do not constitute an increase in course offerings. The existing upper level applied mathematics courses, Mathematics 467 and 468 are offered in alternate semesters. The Department intends to offer these new courses, together with the existing courses, on a rotating basis at the rate of one per semester.

Mathematics 469-4 (Fluid Dynamics), 470-4 (Variational Calculus) and 471-4 (Special Relativity) have been considered by the Undergraduate Curriculum Committee and are recommended to Faculty for approval. These courses represent additional selections to round out the choice of program available for the student in applied mathematics.

In addition, two directed study courses, 493-4 and 494-4, have been considered and approved. And two special topics courses, 495-4 and 496-4, entitled Selected Topics in Mathematics, have similarly received consideration and approval. The contents and composition of the last four courses will vary depending upon the interest of the student and the sequential offerings in the Department of Mathematics.
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B. L. Fun

Passed by the Faculty of Science, November 19, 1970

## FACUTTY O: SCIENCE

NEN COUSS: PROPOSAL

I
. Department: Mathematics
Sub-title or Description:
Course Nurber:469-47itle: F1uid
Dynamics
Kincmatics, sources and sinks; vorticity. Navier-Stokes equations of motion. Viscous flows, dynamical similarity, Reynolds number. Boundary layer theory.

Credit Hows: 4
Vector bescription: 4-1-0
Pre-requisite(s): Mathematics 261-3. Mathematics 411-4 or Physics 382-4 should precede or be taken concurrentily.
II.

CAIEEDAR IEFORUATIOA

Estijnated Emolment: 10
Soncsior offored (e.g. Vearly, evory Sprine; twice joarli, Fall and Spring):

Once every two years
then course will first be offered:
Spring 19\%3
JUSTIFCHTOX
A. What is the detajled descripion of the course foluding differentiation from lower level courses, from similar courses in the same deparment and fron courses in other deparments in the University?

The course will include the topics listed in calendar information (above). Nonc of these topics are taght in any other course in this department or in other departments in the University.
B. What is the rango of topics that may be doalt with in the course?:
C. How does this course fit the goals of the department?

With the addition of this course, the students in Applied Mathematics will have more choice in the selection of upper level courses.
D. How does this course effect degree requirements?

No effect on degree requirements
E. What are the calendar changes necessary to reflect the addition of this course?

New entry
F. What course, if any, is being dropped from the calendar if this course is approved?

None
G. What is the nature of student demand for this course?

Some students in Applied Mathematics have expressed the desire to be exposed to more fields where Mathematics is applied to solve problems relating to natural science.
H. Other reasons for introducing the course.

BUDGETARY AND SPACE FACTORS
A. Which faculty will be available to teach this course?

Dr. R. Lardner, Dr. D.L. Sharia, Dr. E.M. Shoemaker
B. What are the special space and/or equipment requirements for this course?

None
C. Any other budgetary implications of mounting this course:

Nil

APPROVAL - Faculty Undergraduate Curriculum Committee: NOV. 12,1970 Faculty: November 19,1970

Senatc:

Department: Mathematics
Course Number:470-4 7itle: Variational
Sub-title or Descripiton: Calculus

# Prócedures of Eulcr, Lagrange: and Hamilton. Extremum probloms, stationary values of integrals. Canonical equations of motion, phase space, Lagrangian and poisson brackets. 

Credit llours: 4
Vector Description: 4-1-0
Pre-requisite(s):
Mathematics 261-3 or Physics 203-2. Mathematics 411-4 or Physics 382-4 must precede or be taken concurrently.
ERBOLENT ANW SCHEDULING
Fstimated marolnent: : 10
 Spring):
Once every two yoars
When course will first be offered:
Spring 1972
JUSTIFPCMIOS
A. What is the detajed description of the course including differentiation from lower level courses, from sinilar courses in the same dopariment and from courses in other departants in the University?

This course will include the topics listed in calendar information (above).
B. What is the range of topics that may be dealt with in the course?
C. How does this course fit the goals of the department?

With the addition of this course, the students in Applied Mathematics will have more choice in the selection of upper level courses.
D. How does this course effect degree requirements?

No effect on degree requirements.
E. What are the calendar changes necessary to reflect the addition of this course?

New entry
F. What course, if any, is being dropped from the calendar if this course is approved?

None
G. What is the nature of student demand for this course?

Some students in Applied Mathematics have expressed the desire to be exposed to more fields where Mathematics is applied to solve problems relating to natural science.
H. Other reasons for introducing the course.

BUDGETARY AND SPACE FACTORS
A. Which faculty will be available to teach this course?

Dr. G.A.C. Graham, Dr. D. Shadman, Dr. M. Singh

## SFAME PAPROS

B. What are the special space and/or equipnent requirements for thjs course?

None
C. Any other budgetary jmplications of mounting this course:

None

APPROVAL - Faculty Undergraduate Curriculum comattec: NoU. $1.2,1970$
Faculty: November 19,1970

Senate:

CALENDAR INFORUTION

Department: Mathematics
Sub-title or Description:
Space-time continuum, separation between events, Lorentz transformation. Mechanics of discrete system and of continumm, Electromagnctic field in vacuo.

Credit Hows: 4
Vection Description: (4-1-0)
Pre-requisite(s): Mathematics 261-3 or Physics 203-2. Mathematics 411-4 foust precede or be taken concurrently:
or Physics 382-4
ENROLREXT AND SCHEDULIAG
Estimated Fmrolmont: 10
Scmester Offered (e.g. Yearly, every Sming; twice yearly, fall and Spring):
Once every two years
When course will first be offered:
Fal. 1972
JUSTIFICATION
A. What is the detailed description of the course including differentiation from lower level courses, from sirilar courses in the same dopartment and from courses in other departments in the University?

The course will include the topics listed in calendar information (above).
B. What is the range of topics that may be dealt with in the course?

Special Theory of Relativity
C. How does this course fit the goals of the department?

With the addition of this course, the students in Applied Mathematics will have more choice in the selection of upper level courses.
D. llow docs this course effect degree requirements? No effect on degree requirements. --
E. What are the calendar changes necessary to reflect the addition of this coursc?

New entry.
F. What coursc, if any, is being dropped from the calendar if this course j.s approved?

None
G. What is the nature of student demand for this course?

Some students in Applied Mathematics have expressed the desire to be exposed to more fields where Mathematics is applied to solve problems relating to natural science.
H. Other reasons for introducing the course.

BUDGETARY AND SPACE FACTORS
A. Which faculty will be available to teach this course?

Dr. A. Das, Dr. E. Pechlaner
B. What are the specjal space and/or equipmont requirenents for this course?

None
C. Any other budgetary jmplications of mounting this course:

None:

APPROVA - Faculty undergraduate Curriculum Committe: NoU. 12,1970 Facult:: Wovemerer 19, 1970

CARSDAR MHOBATION
Department: MATHEMATICS
Sub-titue or Description:
--
Independent reading or research in topics selected in consultation with the supervising instructor.

Course Number: 493-4

Titte:
DIRECTED STUDY

Credje Houss: 4
Vecior Description: None
Pro-requisjte(s):
This course can only be taken with the permission of the Department.
BROMMEX ANG SCHPMUTMG
Estimated Emrolmont: Enrollment may vary from one to five students per semester.
Scmester Offored (o.g. Yearly, evory Spring; twice ycarly, fall and The course will be of fergrinen: there are interested students and faculty available and willing to supervise.

When course will first be offered:
When requested.

## JUSTIFICATIOX

$\because$ A. What is the detalled description of the course including differemtiation from lover level courses, from similar courses in the same department and from courses in other departments in the University?
This course will enable junior and senior mathenatics students to work with faculty members in areas not covered by the regular mathematics course offerings, at a level more advanced than is possible in the first two years. No similar courses are offered by other departments in the University.
B. What is the range of topics that may be doalt with in the courso?

The range of topics nay include material from pure mathematics, applied mathenatics or probability and statistics.
C. How doos this course fit the goals of the department?

This course, together with the other directed study courses, the honors essay course and the selected topics course, create a flexibility in course offerings which might not outherwise be possible.
D. How does this course effect degree requirements?

This course has no effect on degree requirements.
E. What are the calendar changes necessary to reflect the addition of this course?
The only calendar change necessary is the addition of the course to the listing of mathenatics course offorings.
F. What course, if any, is being dropied from the cabondar if this course is approved?
None
G. What is the nature of student demand for this course?

The lopartment has recejved many requests from jnterested junjor and senjor mathematics students for additional directed study courses.
H. Other reasons for introducing the course.

In view of the fact that it is not possible for a student to take a course with a specific number more than once for credit additional directed study course numbers are reguired.

EUDGTARY ASD S!NCE FACTOSS
A. Which faculty will be available to teach this course?

Any of the faculty mebers ju the Nathenatics Deparment. The course will not be counted as part of any faculty member's teaching load.
$\square$ PARses
B. What are the special space and/or equipment requirements for this course?

None
C. Any other budgetary implications of mounting this course:

None

APPROVAL - Faculty Undergraduate curriculum committee: Nov. 12, 1970
Faculty: November 19, 1970

Senate:

# FACuLTY OF SClance: 

NEW COURSE MROPOSAL

CAIEODR INFORUTHO
Department: MATmbatics
Sub-title or Descripiton:

Course Number:
494-4

Titile:
DIRECTED STUDY

Independent reading or research in topics selected in consultation with the supervising jinstructor.

Crodir Hours: 4
Vector Description: None
Pre-requisjite(s):
This course can only be taken with the permission of the Department.
EnROLMENT ARD SCHBDULTNG
Istimated Fmolment: Enrollment may vary from one to five students per senester.
Scmester Offored (c.e. Yearly, every Spring; twice ycarly, Fall and The course wil. be offerebrith: there are interested students and faculty available and willing to supervise.

When course vij] first be offored:
When requested.
JUSTTHCNTON
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B. What is the range of topics that may be doalt with in the course?

The range of topics may include material from pure mathematics, applied mathematics or probability and statistics.
C. Hov does this course fit the goals of the departhent?

This course, together with the other, directed study courses, the honors essay course and the selected topics course, create a flexibility in course offerings which might not otherwise be possible.
D. How does this course effect degree requirements?

This course has no effect on degree requirements.
E. What are the calondar changes necossary to reflect the addition of this course?
The only calendar change necessary is the addition of the course to the list:ing of mathematics course offerings.
F. What course, if any, is being droped from the calendar if this course is approved?
None
G. What is the nature of student demand for this course?

The Department has received many requests from interested junior and senior mathematics students for additional directed study courses.
H. Other reasons for introducing the course.

In view of the fact that it is not possible for a student to take a course with a specific number more than once for credit additional directed study course numbers are required.
EUSCETARY AND SLACE FACHORS
A. Which faculty will be available to teach this course?

Any of the faculty mombers in the Nathematics Department. The course will not be counted as part of any faculty member's teaching load.

## SENAEPRO.....

B. What are the specjal space and/or equipment requirenents for this coursc?

None
C. Any other budgetary implications of momiding this course:

None

APPROBAL - Facult. Undergraduate Curriculun Comattec: 7ov. 12, 1970
Facults: November 19, 1970
Sonate:

## NEW COUPS: PROPOSAL

CALDER JNFORGUTON
Department: NATHEMATICS
Course Number:
Title:
Sub-ijule or Description: 495-4

SELECTED TOPICS IN
The topics included in this course will vary from MATHEMATICS semester to semester depending on faculty availability and student interest.

Credit Hours: Four
Vector Description: (4-1-0)
Pre-requisite(s):
This course can only be taken with the permission of the Department.
KNROLABN N NO SCHEDMLMC
Estimated limpolment: 5 to 10 students.
Semester Offered (cog. Yearly, every Spring; twice yearly, Fall and Yearly. Spring):

When course will first be offered:
Fall 1971 or Spring 1972
JUS'IFTCAT10:
$\therefore \therefore$. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department and from courses in other departments in the University? This course will be like a standard upper level mathematics course and the prerequisites will be set according to the subject matter covered. The course will be open only to junior and senior mathematics students, and will not include material from existing courses in the Mathematics Department or any other department in the University.
B. What is the range of topics that may be dealt with in the course?

The range of topics will include material from pure mathematics, applied mathematics, or probability and statistics.
C. How does this course fit the goals of the department?

In view of the fact that the Department does not have enough faculty to set-up a program which would include courses other than the basic core program courses, these selected topics courses will. allow the Departinent to offer those courses which do not fite into the basic program but which are a necessary part of the basic knowledge of a mathematics student.
D. How does this course effect degree requirements? This course has no effect on degree requirements.
E. What are the calendar changes necessary to reflect the addition of this coursc?

New entry.
F. What course, if any, is being dropped from the calendar if this - course is approved?

None
G. What is the nature of student demand for this course?

The Department has received several requests for courses not included in present course offerings.
H. Other reasons for introducing the course.

The Department is requesting approval for two selected topics course numbers as it is not possible for a student to receive credit for a course with a specific number more than once.
IV
budgetary avd space factors
A. Which faculty will be available to teach this course?

Any of the Faculty Members in the Department.
B. What are the special space and/or equipment requirements for this course?

NONE
C. Any other budgetary implications of mounting this course: NONE

APPROVAL - Faculty Undergraduate Curriculum Committee: NoU, 12,1970 Faculty: Movember 19, 19-70

Senate:

## CALENDAR INHORUTJON



Credit Hours: Four
Vector Description: (4-1-0)
Pre-requisite(s):
This course can only be taken with the permission of the Department.
II bNrolment ABD SChemulang
Estimated Emolment: 5 to 10 students.
Semoster Offered (e.g. Yearly, cuery Spring; twice yoarly, Fall and Yearly. Springs):

When course wijl first be offered:
Fall 1971 or Spring 1972

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B. What are the special space and/or equipment requirements for this course?

NONE
C. Any other budgetary implications of mounting this course: NONE

- Appoval, Faculty Undergraduate curriculum Comittec: Nov.12,1970 Faculty: Novemere 19,1970

Senate:

