TEACHING & DOING MATHEMATICS WITH MAPLE

With Michael Monagan

**Monday to Friday
August 11th – 15th, 2008
8:30am – 5:00pm**

DEPARTMENT OF MATHEMATICS
FACULTY OF SCIENCE
SIMON FRASER UNIVERSITY

ABOUT THE COURSE

This super course, now in its eighth year, is intended for people who are teaching mathematics or using mathematics in their work who would like to learn Maple from an expert. Maple is an industry leader in mathematical computation. It includes facilities for exact algebraic computation, numerical computation, graphics, and a modern graphical user interface as a working environment.

The course is designed to help you:

- Learn to use Maple interactively as a problem solving tool;
- Plot curves and surfaces;
- Create graphic images and animations;
- Learn to use the facilities available in Maple for mathematics applications;
- Write simple Maple programs;
- Learn how to incorporate Maple into a Mathematics course;
- Prepare course materials and documents for live presentations, assignments, exams, and publication; and
- See lots of applications where using the computer is appropriate for teaching.

COURSE OUTLINE

The course is divided into five days running from 8:30am to 5:00pm. The first day is especially for those who have not used Maple before.

Mornings include instruction from Dr. Monagan. In the afternoons, participants work with Maple in a lab, under Dr. Monagan's guidance. The lab has 22 Dell PC's running Windows.

COURSE SCHEDULE

Day 1: Monday, August 11th
Introduction to Maple
Numbers, polynomials, simplifying formulae, solving equations and graphing curves and functions. Animations. Creating Maple worksheets.

Day 2: Tuesday, August 12th
Calculus and 3D Graphics
Integration. Taylor series. Graphing curves and surfaces. Animations. Data fitting and statistics. Creating teaching and presentation materials in Maple and HTML.

Day 3: Wednesday, August 13th
Algebra
Vectors, matrices and linear algebra in Maple. Graphing of linear systems, and eigenvectors for teaching. Plots of partial derivatives & tangent planes. Solving polynomial systems, factoring polynomials and Groebner bases. Graph Theory in Maple.

Day 4: Thursday, August 14th
Differential Equations and Scientific Computing
Analytical solutions, numerical solutions, phase-portrait plots. Numerical linear algebra. Examples of first order systems for teaching. Creating your own graphics and animations.

Day 5: Friday, August 15th
Programming in Maple
The Euclidean algorithm, a cellular automaton, fractal images, symbolic differentiation of a formula, and RSA public key encryption.

Course fees include all handout materials, coffee & snacks, and parking. Fees of more than $100 are tax-deductible and are GST exempt in Canada. Please note the fees are in Canadian Dollars. US citizens may pay in US$ at a rate of $1.00CDN = $0.97USD.

		*Early	Regular
☐	**Option 1:** 2 days	$250	$300
☐	**Option 2:** 3 days	$350	$400
☐	**Option 3:** 4 days	$450	$500
☐	**Option 4:** 5 days	$500	$550

Please tick which days:

Mon	Tues	Wed	Thurs	Fri
☐	☐	☐	☐	☐

* Early registration is prior to <u>July 23rd, 2008</u>.

Enclosed fee in the amount of $_____

Name _____

Position/Title _____

Organization _____

Address _____

_____

Postal Code _____

Telephone _____

Fax _____

E-Mail _____

Enrolment is limited to 22 participants.

Complete and return this form along with fee payment to:

>**Casey Bell**
>Department of Mathematics
>Simon Fraser University
>Burnaby, BC V5A 1S6
>**Phone:**   778.782.3331
>**Fax:**   778.782.4947
>**E-Mail:**   maplecourse@sfu.ca

Fees should be paid by cheque, **<u>payable to: Simon Fraser University.</u>** Faxed reservations are accepted. When registering by e-mail, please provide full registration information.

Cancellation Policy

Cancellation of registration prior to August 4th is subject to an administration fee of $75. Cancellations after this date do not qualify for a refund, but replacement registrations are welcome. The cancellation request may be made in writing, by telephone or by e-mail and the original Simon Fraser University fee receipt must be returned.

Location:

>**Room K9509**
>**Shrum Science Centre**
>**Simon Fraser University**
>**Burnaby, BC**

Fee: *See registration area for fee structure.*

Sponsored by:
>**Waterloo Maple Inc.,**
>**Waterloo, Ontario**
>**(the developers of Maple)**

Organized by:
>**The Department of Mathematics**
>**Faculty of Science**
>**Simon Fraser University**

For Further Information, please contact:
>Dr. Michael Monagan
>778.782.4279 or (604) 264-1063
>Electronic Mail: mmonagan@cecm.sfu.ca

Michael Monagan is an associate professor in the Department of Mathematics at Simon Fraser University. Dr. Monagan has a PhD in computer science from the University of Waterloo. He is one of the Maple inventors and is using Maple in teaching and research. He is an author of the book *Programming in Maple Guide.*

Dr. Monagan has experience with industrial applications of Maple and experience with using Maple in the classroom. He is currently involved in the continuing development of Maple and his interests include scientific computing, polynomial factorization, and visuals for teaching.

Participants will be given a library of applications of Maple that Dr. Monagan has assembled over the last 8 years.

Participants will also be able to browse a collection of Maple books.

Course participants will have the opportunity to purchase a full version of Maple for their personal computer at a special rate of $**200** (plus taxes) during the week of the Maple Course. Maple is available for the MacIntosh, Windows and Linux on a CD only.

(Normal Academic Price is $895 plus taxes*)*