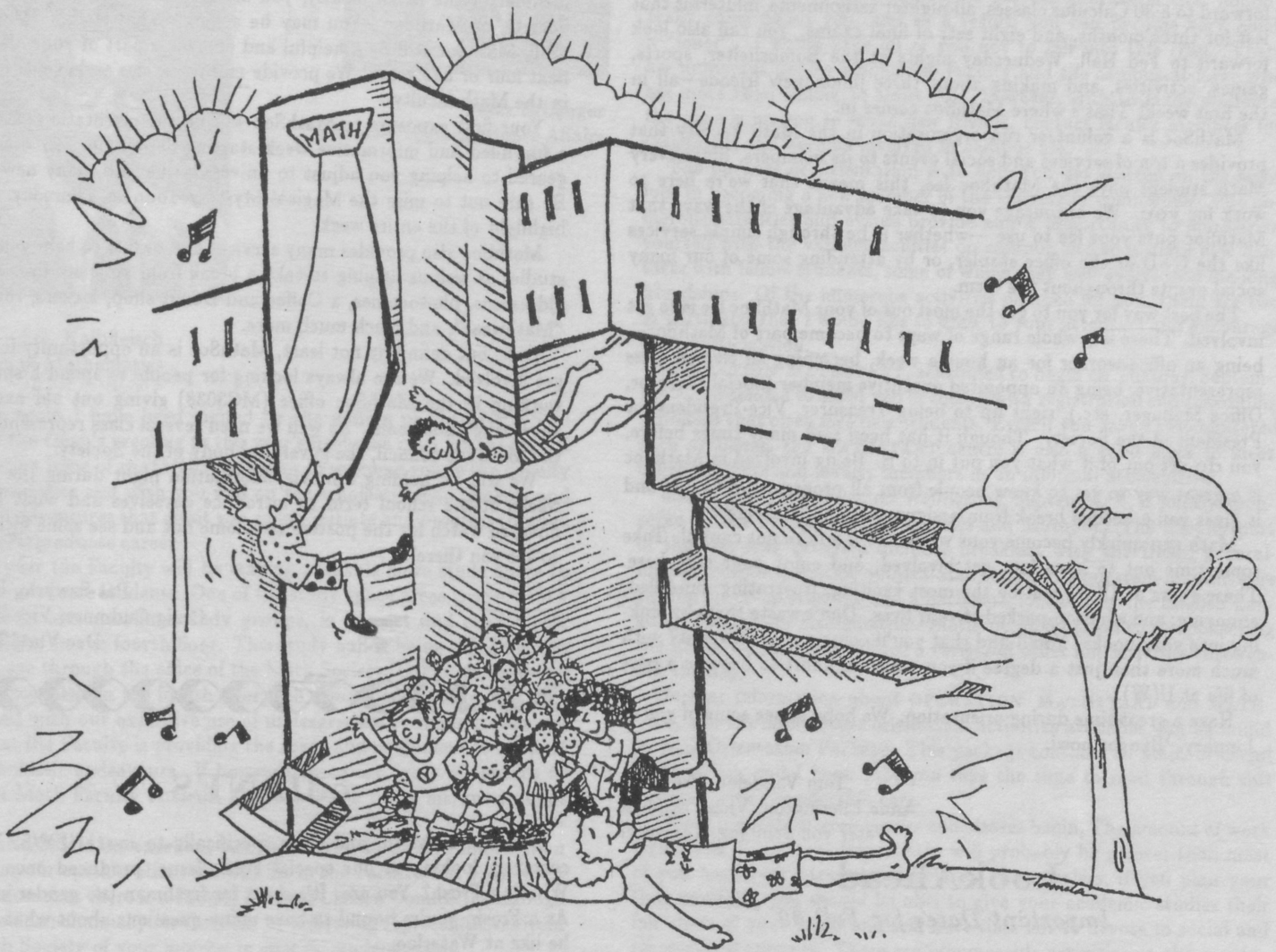Your friend,

math NEWS

Volume 51 Number 0

frosh issue 1989

Messages From the Math Societies

Two different streams of MathSoc require two different councils. The President (and Executive) are elected from time to time by the Math students at large. Each is responsible for running the affairs of the Society during the term(s) of his/her election. Among the many duties of the office is the welcoming of Frosh...

Tom Vandeloo
Pres. Spring 1989

Welcome to Waterloo! For the next four or five years you can look forward to 8:30 Calculus classes, all-nighter assignments, midterms that lest for three months, and eight sets of final exams. You can also look forward to Fed Hall, Wednesday nights at the Bombshelter, sports, games, activities, and making about three jillion new friends—all in the first week! That's where MathSoc comes in.

MathSoc is a volunteer run organisation in the Math Faculty that provides a ton of services and social events to its members. Since every Math student pays the MathSoc fee, this means that we're here to work for you. We encourage you to take advantage of the ways that MathSoc puts your fee to use —whether it be through simple services like the C+D or the office stapler, or by attending some of our many social events throughout the term.

The best way for you to get the most out of your MathSoc fee is to get involved. There is a whole range of ways to become part of MathSoc—being an office worker for an hour a week, becoming an elected class representative, being an appointed executive member (Social Director, Office Manager, etc.), right up to being Treasurer, Vice-President, or President of the Society. Though it has been said many times before, you do get out of it what you put in to it. Being involved in MathSoc is a great way to get to know people from all programs and years and it gives you a needed break from assignments and studying.

Math can quickly become your whole life if you're not careful. Take some time out to have fun, get involved, and enjoy your stay here. These years at U(W) will be the most exciting, frustrating, fun-filled, annoying, and emotion-packed of your lives. Don't waste them by sinking into your books. You'll find that you'll come out of university with much more than just a degree if you make an effort to become a part of life at U(W).

Have a great time during orientation. We hope to see some of you in January. 'Bye for now!.

Tom Vandeloo, President
Anne Ellerington, Vice-President
Peter von Schilling, Treasurer

LookAhead

Important Dates for Fall 89

Date	Details
Sept. 5–8	Orientation and Registration
Sept. 5(10:30 a.m.)–22	OPERATION MATHSTART (MC 5158)
Sept. 6	Faculty Orientation Program
Sept. 6 (7:00 p.m.)	ELPE in the PAC
Sept. 6 (11:00 a.m.)	"Advanced/Honours" Special Meeting
Sept. 11	Beginning of Lectures
Sept. 22	End of ADD a course period.
Oct. 6	Deadline for dropping a course.
	Deadline for Advanced-Honours transfers.
Nov. 8–10	Pre-registration for Spring Term.
Dec. 4	Lectures end.
Dec. 7–21	Final Exam Period.

Pat Szwyrlo
Pres. Fall 1989

Congratulations on choosing Math at Waterloo. Since you are a member of the Math faculty, you are a member of the Mathematics Society, or MathSoc. You may be asking, What is this "MathSoc"? Well, MathSoc will be a helpful and enjoyable part of your life for the next four or five years. We provide many services and events for those in the Math faculty.

Your first exposure to MathSoc will be the orientation week. It is a fun-filled and informative week starting September 5th with events geared to helping you adjust to university life and many new people. Be sure not to miss the Magical Mystery Tour on Thursday. It's the highlight of the entire week.

MathSoc also provides many services and events to help you in your studies as well as helping to take a break from your studies. We offer old exams, photocopies, a Coffee and Donut shop, lockers, road trips, "Mathwear", and much much more.

Last, but definitely not least, MathSoc is an opportunity for you to get involved. We are always looking for people to spend a spare hour working in the MathSoc office (MC3038) giving out old exams and answering phone calls. As well we need several class representatives to the MathSoc council, the governing body of the Society.

We will be holding a movie/information night during the first few weeks of the school term to introduce ourselves and what MathSoc does, so watch for the posters and come out and see some flicks. Hope to see you there!

Pat Szwyrlo, President
Craig Cudmore, Vice-President
Dee Vint, Treasurer

edLINES

Welcome to Math, and more specifically to *math*NEWS. You are currently looking at our special Frosh Issue, produced once a year. What's a Frosh? You are. It's short for freshman (no gender implied.) As a Frosh, you're bound to have many questions about what life will be like at Waterloo.

In this issue are articles to tell you what to bring to Waterloo, how to cope when you arrive, to make you laugh, and to start you off in the right way. Also included at the back is the Orientation section. These pink pages will list all the Orientation events happening in your first week. Get out to as many of these events as you can—they're lots of fun, and you get to meet many of your soon-to-be classmates.

Hopefully, *math*NEWS serves as a reminder not to take things too seriously. Studying math at Waterloo can be fun. Try not to get too bogged down in your studies; remember, school work is only part of what university's all about.

Have a great term, eh!

Stephen Smith, Editor
(Yes that's my real name)

From The Faculty

Peter Brillinger
Director, Undergraduate Affairs
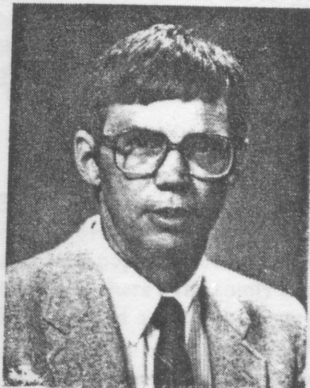
J.G. Kalbfleisch
Dean of Mathematics

Once again I have been invited by the editors of *math*NEWS to provide the Dean's greeting to this year's freshman class for the special Orientation Issue of *math*NEWS. I want to welcome you to the Faculty of Mathematics and wish you well on the scholastic achievements and personal adventures that await you as you initiate and progress through your undergraduate career.

This year the Faculty will be making available more study space to its undergraduate students. One of the study space areas is specifically designed to accommodate study *groups*, in a quiet and comfortable atmosphere, on the fourth floor. This study hall is being scheduled for student use through the office of the Math Society. Other conventional study space, also on the fourth floor, will remain open 24 hours a day. Combined with our extensive use of undergraduate computer labs, we hope that the Faculty is providing the space and equipment to support your scholastic endeavours. If however, there are areas of concern to you as a Math Faculty student, please feel free to let me know about them.

*math*NEWS is an excellent vehicle for you to receive information and offer your opinion about student life in the Faculty, but I also want you to know that there is a Faculty Student Liaison Committee through which you can channel your concerns by informing representatives from the Math Society of your interest in specific student issues.

While your home base will be the Faculty of Mathematics, and you will primarily be travelling across that part of the campus closest to the Math and Computer building with occasional forays to the Davis Centre, I would recommend that you expand your horizons to include other activities and exposure to academic material offered in the other faculties across campus. The campus has much to offer in terms of both social and academic activities, and you should endeavour to involve yourself in the larger community.

I hope you will have success in your academic achievements and pleasure in your time here as a student in the Faculty of Mathematics.
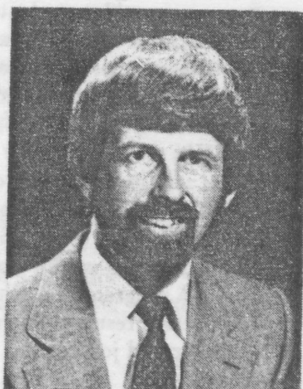
J.G. Kalbfleisch
Dean of Mathematics

As Director of Undergraduate Affairs in the Faculty of Mathematics, I would like to extend a warm welcome as you embark on your freshman year at the University of Waterloo. We are all fully aware that your first few weeks on campus can be rather hectic ones as you adjust to a totally new, and sometimes intimidating, environment. I hope that you will take advantage of every opportunity to make things as pleasant as possible for yourself.

At a large university it is easy to get the impression that nobody really cares about you, and as a result, you can become very much a "loner". I would urge all of you not to fall into this trap. There are numerous people around the Faculty and the campus-at-large who are more than willing to assist you. However, with so many students, the onus is on you to make new friends, contact faculty members for assistance, and become involved in campus life.

The purpose of Orientation is to help you get started on the right foot in becoming a new member of the University community. The numerous activities and events provide ample opportunity to familiarize yourself with the various facilities on campus and to initiate new contacts with fellow students, some of which may well evolve into life-long friendships. Of the numerous activities planned for you, there are two in particular that I would like to draw to your attention and encourage your participation.

OPERATION MATHSTART, scheduled to begin on Tuesday, September 5, is intended to assist you in coping with registration and scheduling problems that often face new students. Even if you haven't encountered such problems, the MATHSTART centre is also a good place to meet other students and faculty members in an informal atmosphere.

MATH DAY, scheduled on Wednesday, September 6, is jointly sponsored by the Faculty of Mathematics and MathSoc. The Faculty part of this day-long program includes breakfast with the Dean, general-interest sessions, specific subject-area sessions, a question-and-answers session for co-op students and a barbecue, followed by the English Language Proficiency Examination. MathSoc, in addition to co-sponsoring the barbecue, has also planned a variety of other fun activities throughout the day.

Further information about OPERATION MATHSTART and MATH DAY, and the many other orientation activities available, can be found in your Orientation Package. This package contains all kinds of useful information, and I hope that you take the time to read through this material with considerable care.

Once Orientation week is over and classes begin, The amount of work facing you in the next few months will probably be greater than most of you have ever encountered before. Nevertheless, if you plan your time carefully, you should be able to give your academic studies their fair share of your hours and still have time left to devote to social and recreational pursuits. There are innumerable activities on the campus to suit everyone's tastes. The secret is to find a good mixture of enjoying yourself and doing justice to your studies. The actual blend in this mixture will largely depend upon individual interests and academic ability, and these vary considerably from one person to another. Nevertheless, it is vital that you devote some of your time to both scholastic and social activity if you are to have a rewarding time at university.

I urge you not to delay. Get involved and start working right at the beginning of the year. Don't wait until "later". "Later" may just be too late!

Peter Brillinger
Director, Undergraduate Affairs
Faculty of Mathematics

mathNEWS
What is it?

mathNEWS is your newspaper! mathNEWS funded by MathSoc, has a mandate to entertain and inform U(W) mathies and anyone else who has the good fortune to come across a copy of mathNEWS. mathNEWS comes out every other week (every third week during the summer) on Friday mornings at 8am. mathNEWS is *the* preferred distraction from your Friday morning classes.

mathNEWS, however, is only as good as those who put it together (currently quit excellent -ED). So come out some Monday night if you've ever wanted to see your work in print, or help put together a masterwork that will be cherished until the end of time, or at least until the next issue comes out. We need people to write articles, type them in, cut and paste them together, and eat the pizza we order every production night. If you've never worked on a newspaper before, don't worry! We'll teach you how to use UNIX, LATEX, and exacto knives, as well as how to eat pizza.

Watch for posters advertising our organizational meeting during frosh week. We'll be choosing an editor at this meeting as well as filling several semi-official positions on staff. If you'd like to help out, show up at this meeting, or leave a note in the mathNEWS office MC3041. Come on out and be a part of mathNEWS!

Stephen Smith

My Life as a mathNEWSwriter

I used to be a dull, boring, poor excuse for a human being. My life had no direction. My biggest thrill was differentiating logarithmic functions on a Friday night.

Then, one day, a friend of mine asked me to come out to a mathNEWSproduction night. I replied, "But I can't write anything! I'm just not good enough." He said, "That's OK, we probably don't need you for anything. I just need a ride home."

Despite his remarks, I put together a small article and showed up the following Monday at 7 P.M. As luck would have it, the friendly editor was impressed. He smiled and said, "This is great!" It was the first time anyone had said anything of mine was great. My self-esteem was on the rise.

I showed up to the next production night with another article. The editor laughed hysterically. "Do you really think it's funny?" I asked.

He replied, "Oh, no, this is a piece of garbage," as he crumpled it and tossed it in the trash. "But, hey, there's lots of other stuff you can do. We need people to type other articles in. We need people to lay out these articles on the pages. There are lots of things you can do."

I looked at him and suddenly realised that production nights are fun. I had met a lot of interesting people. I had eaten a lot of free pizza (the traditional mathNEWS staffer's dinner). And, above all, I had gotten involved in the production of one of the greatest publications of all time just by showing up one Monday night. It was a great feeling, knowing that the following Friday the whole Math faculty would be reading mathNEWS (during my 8:30 class, of course). And I was a part of the reason that it could happen.

Well, that's my story. Thanks to mathNEWS, my life has a purpose. I'm now a highly respected member of my community—a dominant figure in one of mankind's greatest achievements. This can happen to you, too, so remember: Come out on Monday night!

Rob del Mundo
Winter 1989 Editor's assistant
in charge of phoning for the pizza

Student Vocational Advisors

The Student Vocational Advisor (SVA) programme assists students with answers to questions on career planning and job search. The SVA programme provides students with a readily and easily approachable peer resource to help them with all aspects of the job search, whether the job is a summer job, co-op position, or full-time career.

SVAs are students trained in all areas of career planning and job search. SVAs are volunteer students who work closely with Career Services. SVAs maintain weekly office hours within all six faculties. Office locations and hours can be obtained from Career Services in Needles Hall, or from SVA posters located around campus at the beginning of the fall and winter terms. Students seeking help should drop into an SVAs office during weekly hours.

The SVA programme can help students to identify skills and interests, write effective resumes, develop successful interview skills, and plan their career and job search. Visit an SVA and make an investment in your future.

Hierarchy of Life

Mathies
The Natural Log/The Pink Tie
mathNEWS
C+D
Coke Classic
Canadian Beer
MathSoc
Bombshelter
Club 750 (a.k.a. Fed Hall)
Math Frosh
Calvin and Hobbes
Jolt Cola
SCOOPS
HP Calculators
Cinema Gratis
π
8:30 classes
Other Frosh
Artsies
η
TA's
Campus Sculptures
The William G. Davis Centre
High school down the road (WLU)
New Coke
ξ
Kitchener Transit
Dept. of Co-operative Education and Career Services
High school down the highway (Guelph)
Village "Food"
IBM
Needless Hell
Keeners
American Beer
Imprint (Imp'tint)
UWO (Western)
Engineers
The P-word
EngSoc
The Ridgid Tool
Hierarchies of things
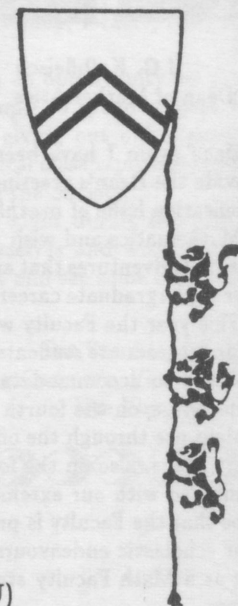
MathSoc

What is MathSoc?

MathSoc is the student society to which every math student belongs. The society is active in all areas of math student life: from the faculty level right on down to the frosh. MathSoc uses your $5.00 fee to provide all kinds of services and events for its members.

Where can I find MathSoc?

The MathSoc office (often referred to as "the Office") is located in room MC3038 across the lobby from the C+D. This small room is the hub of all MathSoc activities as well as the best place to go when you have any kind of problem. If we don't know the answer, chances are we know someone who does.

What does MathSoc do?

MathSoc provides all kinds of services for its members. These include: office supplies, a telephone, change ($$), a lost & found, a mail drop, a first aid kit, copies of old midterms and exams, photocopiers at a nickel a pop, and locker sign-ups at the beginning of the term. Across the lobby there's the comfy lounge and the C+D where you can get all kinds of food and drink at very reasonable prices. On the fourth floor, MathSoc runs a group study room (booking forms available in the Office). MathSoc also provides, for a low price, buttons, rulers, pink tie pins, and T-shirts.

Along with all the services, MathSoc also organises and runs lots of social events throughout the term. These range from bands at Fed Hall to Blue Jays road trips to Oktoberfest tickets to BBQ's and more. All of these events are subsidised somewhat by your fees and so are considerably cheaper than you might expect.

Who does all of this stuff?

In case you haven't already noticed, there's an awful lot going on in MathSoc. As you might guess, lots of people are needed to staff the office and help out with social events. These people, all volunteers from the society, are called (cleverly enough) the office workers. Office workers spend an hour or more a week just sitting in the office and acting as a well of information and assistance to anyone who comes in. You don't have to know much to be an office worker, just where the staplers are and who's next in the chain of command if you can't answer somebody's question.

Who's really in charge?

MathSoc itself is run by the MathSoc Council. This council consists of three groups: the elected executive, the appointed executive, and the class reps. The elected executive, the President, Vice-President, and Treasurer are elected to office every so often and are the ones ultimately in charge of what MathSoc does. The appointed executive consists of the Social Director, Internal Rep, External Rep, Office Manager, Publicity Director, Council Secretary, Mathletics Director, and MGC Chairman. Class reps are elected by each class (1st year regular, 3rd year co-op, etc.) at the beginning of each year. Each of these positions holds a varying degree of responsibility and commitment.

Where do I sign up?

If you're interested in becoming a part of this campus' most exciting and dynamic student society, MathSoc is for you. You can get involved to any degree you want, from office worker to elected council member. The demands on your time aren't bad, and you'll meet a whole bunch of people who are as interested as you in having the best time possible while at good ol' U(W).

The Pink Tie

Waterloo leads the world (or at least Canada) in technological education. We can boast about leading the fashion world, too. Many people have taken to wearing pink ties as part of their everyday attire. Waterloo started this fashion trend. You see, the Pink Tie is the (un)official mascot of the University of Waterloo Mathematics Society.

How did Waterloo start this trend? As the story goes (passed down from grads to frosh over the decades), there once was a particular professor of mathematics who loved to wear outlandish gaudily-coloured ties. One of these ties was mostly pink with strange lines on it. This particular professor also happened to be the founding dean of the fledgling Faculty of Mathematics, lending some importance to his attire.

Mathematics students, being the unconventional bunch they usually are (and we hope you are no different), seized the wonderful opportunity for being irreverent but non-destructive and chose a tie as their official symbol, and pink as its official colour.

During the construction of the Mathematics and Computer building in November 1967, some of the aforementioned math students decided that the new building was a monstrosity and could use some decoration. (Some people still say that. Then they go and design the Davis Centre—it's even worse!) Late one Sunday night a few weeks later, a handful of brave mathies found their way on to the roof of the brand new building. On Monday morning the campus awoke to see an 85-foot Pink Tie hanging from the roof!

MathSoc adopted the tie, and inherited the dry-cleaning bills, until the tie was stolen for a final time and irreversibly desecrated by heathen engineering students. A second Pink Tie was commissioned and served faithfully until September 1986, when it was paint-bombed. (Some people have no sense of decorum.) This year you will see the most recent Pink Tie hanging from the Math building when you arrive for Orientation Week.

The Pink Tie is a symbol of the Faculty of Mathematics and the Math Orientation Committee. *math*NEWS has adopted the Pink Tie as the symbol of all things good and mathematic. (MathSoc's official symbol is the Natural Log, but the Tie perseveres regardless!) As the legend of the Pink Tie lives on, it is commemorated in the fashionable item of clothing you wear as a Waterloo Math frosh. Wear the Pink Tie with pride.

dwarf
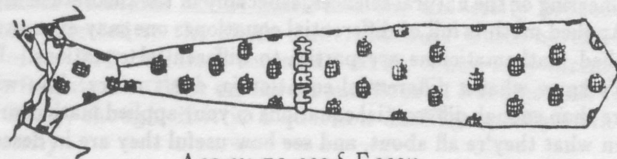
Λεαρν το ρεαδ Γρεεκ

Math Faculty Programs

Actuarial Science

An actuary? Huh? What's that? Don't be upset if you don't know - most people don't, and presumably you're reading this to find out. Actuarial science is a rarity, being both a mathematical field of research and a valuable way of gaining employment.

So what does it involve? The role of the actuary is presumably to predict financial gain and loss positions several years into the future. As a result, the actuarial science program studies, in some depth, probability theory and theory of interest. This is the sort of analysis that applies well to insurance situations. (How long will they live? How much will we have to pay them?) So you find almost all actuaries working for insurance companies or private consulting firms. They play an important role in pricing of products, as well as determining the valuation of financial reserves.

"Did you mention something about jobs?" As a matter of fact, yes. Actuaries always have, and will continue to be in demand. Employers certainly appreciate the scarcity of acturaries, and are quite willing to compensate them appropriately. But, there has to be a catch, right? Well, in order to qualify as an actuary, the Society of Actuaries has deemed that you must pass what was formerly ten large exams, and now several smaller exams. But a really keen student can pass up to half of them by graduation.

Is the course really hard? Well, maybe not so much hard as it is unique. It requires a totally different application of the mathematical concepts learned here at U(W). But is is interesting and somewhat practical. Give it a try, you'll be gald you did when you graduate.

Applied Math

Applied mathematics is the study of mathematical methods for solving physical problems. While this may sound a lot like engineering, there is a crucial difference. Engineering concerns itself with the actual physical problems and seeks to find quantitative answers to those problems: applied mathematics is concerned with the mathematics involved in finding those solutions and seeks to further knowledge about the mathematics, or to discover new methods of solution. An applied mathematician must be able to 'stand back' from his solution and see where it fits in the universe of mathematics. Applied mathematics is thus a bridge between the mathematical world and the physical world. Despite the difference, there are strong ties between applied mathematics and the world of engineering and the natural sciences, and much overlap. Many graduates of the applied math program go on to work in engineering or the natural sciences, especially in the theoretical aspects.

Applied math is full of differential equations: one may even say that applied mathematicians are partial to differential equations. If you don't know what a differential equation is, don't worry. You will see more than enough differential equations in your applied math courses to learn what they're all about, and see how useful they are in describing physical phenomena.

If you find the physical world to be an interesting place, and like to look at it from a mathematical perspective, then applied mathematics may be the program for you.

Combinatorics and Optimisation

Explaining what C&O is all about is quite an undertaking. Your best bet when trying to explain it to your parents is "It's just math, mom." However, we can't get away that easily. Waterloo has the first C&O department in the world. C&O is certainly more than 'just' math.

Combinatorics is a diverse field, involving many subject areas. The first two you will encounter (in C&O 230) will be graph theory and enumeration. Graph theory deals with ways to solve problems through pictorial methods. Transportation problems, organisational models, computer science algorithms and more can be studied through graph theory. Enumeration is counting theory, dealing with ways to combine items or form patterns, from something as mundane as making change to highly esoteric theories.

Optimisation is the modelling of problems, subject to boundaries and constraints, to yield the best possible solution. The practical upshot of this is that optimisation methods, such as linear programming, can be used to predict and account for bridge stresses, to optimize factory floor space and to produce 'best fit' solutions to many complex problems with large numbers of variables.

C&O has long been a special part of Waterloo. The discipline has only developed fully in the last hundred years, and a large part of the work has been carried out by UW faculty. The many areas for research and rapidly broadening horizons of C&O make it one of math's most interesting departments. We may not know how to explain it, but we're sure it can be well worth investigating!

Pure Math

"A Pure Mathematician is someone who has his feet planted firmly in the air."

This is a popular view of what pure mathematics is, and it is not so far from the truth. As opposed to the engineer, whose interest in mathematics is limited to what is useful to him to build bridges or airplanes, the pure mathematician enjoys mathematics for its own sake; applications are somebody else's concern. Nevertheless, this puttering about with theorems and conjectures is rarely useless. A famous example is G.H. Hardy's claim that the number theory he was developing was totally impractical for anything other than itself; yet today this provides the foundation for unbreakable ciphers. The engineer evaluates integrals with gay abandon, but it is pure mathematics that proves his methods work (in fact even that the concept of 'integral' makes sense!).

Consider these questions: Given a hairy billiard ball, is it possible to comb all the hair so it lies flat everywhere? How can the concept of prime numbers be generalised from the integers to polynomials, and what analogies can be made between the two? Can every even number be expressed as the sum of two primes? If these questions pique your curiosity, Pure Math is where you'll find the answers. (Well, nobody knows for sure about the last one (yet)). The sheer elegance of mathematics shines at its best here, unencumbered (although often inspired) by the "real world." And while you may consider a theorem to be ephemeral compared to the Brooklyn Bridge, remember that the theorem's truth will far outlast the bridge's lifespan.

Business Option

The Business Option combines courses from both UW and Wilfrid Laurier University. It provides the student with an excellent knowledge of business practices and policies to complement his or her BMath degree. Normally one business course per term is taken at WLU, with the remaining courses at UW. Be advised that if you are at all considering this option, your first year course selection *should* include BUS 111/122 and ACC 121/122.

Teaching Option

One of the biggest complaints I hear from students is that whenever they tell a layman that they are in Math, that person asks if they want to be a teacher. Well, some of us actually do want to teach when we graduate, and the Mathematics Teaching Option is the best way to earn your degree and teaching certificate. The program begins in 2A when you go through a set of interviews before you are accepted to the Option. If you are accepted, your stream changes drastically, and you flip between 4 and 8 stream people constantly. Also, you lose a work term but you gain a 4 month term at Althouse Teacher's College at the University of Western Ontario. The reason for the reduced time at teacher's college is that the last three work terms are spent in a high school (or possibly a senior public school) classroom, and by the last teaching work term most students have a full teaching timetable. In other words, you will have 12 months classroom experience and a Math degree. Boards of Education will be knocking down your door to hire you.

The best part about Teaching Option: You get up to 4 Summer School terms.

The worst part about Teaching Option: The salaries are incredibly bad (worse than CA's). If you want money go into Actuarial Science.

Least known fact: You can graduate from Teaching Option by completing any other Undergraduate Major requirements instead of the Teaching program.

Campus Media

The University of Waterloo, as one of Ontario's largest universities, has its share of on-campus media. The campus radio station is CKMS-FM 94.5, an alternative radio station which thrives on volunteer DJ's. If you thought CFNY was unpredictable, you've never heard CKMS.

The University also has a large selection of newspapers for your perusal. They're all free (once you take into account that some of them come from the fees that you pay), so unless you've refunded your Math-Soc and Imp'tint fee, feel free to pick up a copy of any of these.

Imprint (a.k.a. Imp'tint) is the official student newspaper on campus. It is loaded with opinions, advertising, record reviews and some campus-type news. It appears late Friday morning at various places on campus.

The *Gazette* is the University administration's newspaper. This paper comes out every Wednesday, and contains articles of interest to the University community. and takes a generally conservative or sceptical view of things, except when dealing with things that the administration is gung-ho about. The best part about the paper is the Notebook section with one-paragraph tidbits of things (watch for *math*NEWS excerpts).

*math*NEWS (what you're reading now) is funded by MathSoc and presents an interesting mix of information and humour in a magazine format. Unfortunately, resources prevent us from being a real magazine. *math*NEWS comes out on alternate Fridays, usually before 8:30 classes, so you can pick it up and read it in calculus. People have called us the best paper on campus. Find out why.

The Engineering Society (boo, hiss) produces a monthly newspaper called the *Iron Warrior*. This is a generally serious paper containing articles of interest to engineering students and math students taking engineering electives. They deliver a bundle to the Davis Center whenever they come out.

Occasionally the Science Society or the Arts Society gets its act together and publishes its respective newspaper (*Opus* and *The Arts Lion*). Halley's Comet returns slightly more often than these papers are published so don't hold your breath.

Enjoy the reading. It's a great break from classes.

Writin' de ELPE
What's dis? Ah gots t' scribble some test de damn fust week here!?

Relax. Ya' know? Fust, ya' duzn't gots scribble de English Language 'fishunsy 'Sam, if ya' gots at least 80% in OAC English in high school. So's we're not all english whizzes, but hey, ya' still gots nothin' t' worry about.

All ya' gots t' do be scribble an *essay*. Duzn't worry, it doesn't gots t' be deep. It doesn't gots be meaningful. What it is, Mama! It doesn't even gots t' say anythin'. It plum gots'ta t' use gooood english. What it is, Mama!

What's more, ya' kin fail it as many times as ya' likes. Dat's right. Right On! If ya' fail it now, ya' kin try again, ... and again, ... and again, until de end o' time (o' ya' graduate, whicheva' comes fust).

But wait. Right On! Dere's one final cop-out. Right On! If ya' does English 109 and pass it, ya' neva' gots t' scribble de ELPE again. Ya' would neva' gots t' use english again as long as ya' live. Right On!

When ya' leaves, youse can proudly say, "Four years ago, I couldn't spell 'mathematician', now I are one."

Problem Solvers

University is going to be a new world to you and with it comes new problems to be solved (calculus assignments excluded.) Here's an article to show you where to go and who to ask when these problems arise.

The first problem solver you will encounter will be your big brother or big sister. Once upon a time they have had the same questions answered for them, probably by their big brothers and sisters, so use them during orientation week and after to help you. MathSoc is another place to go for help throughout the term. Although the friendly office worker may not know the answer, he/she will probably know where you can find it.

Questions dealing with your courses or future in math are best directed to your faculty advisor. OPERATION MATH-START is set up in room MC 5158 to be your registration and scheduling problem solvers in the first days at school. Starting Tuesday, September 5, MATHSTART should be a necessary stop for all students with problems that should be tackled right away. (If there is a lineup, go stop by the Drop-In Centre for a while, then return to MC 5158.) These professors will be able to guide you through course selections and academic problems a student in the prof's particular field may encounter.

General questions about math and the university procedures are best directed to the Math Undergraduate Office on the fifth floor of the MC building, room MC 5115. They may direct you to the Registrar's Office on the second floor of Needles Hall room (NH 2001), though, if it is a question dealing strictly with the University.

Across the hall from the Registrar's Office is Counselling Services, room NH 2002. Here, professional counsellors will be able to help students with their concerns about school, life, or their futures. The Chaplain's Office in room NH 2050 offers the same type of help in a spiritual manner if you so prefer.

The Ombudsman is a counsellor of the pseudo-legal variety. He/she is on campus in the Campus Centre, room CC 235, and is approachable free of charge by appointment for any student wishing legal help.

Hopefully, any question or concern you have can be answered by using one of the services mentioned here, but only you can search them out. May these helpful hints of where to go when you have a problem be sufficient in helping you.

The Frosh Dictionary

A list of terms you may wonder about

Arts Library (Dana Porter): The main campus library, the big sugar cube at the centre of campus. According to legend, it's slowly sinking due to the weight of its books.

Bombshelter: The original campus pub and party place, a great alternative to Club 750 (q.v.), serves pizza for lunch.

C+D: The MathSoc Coffee and Donut shop, a food bonanza full of ice cream, caffeine and pastries at good prices. Located in the C+D lounge (cleverly enough) in the south end of the third floor of MC. Just follow the smell of coffee and bagels.

Campus Centre (CC): Student building between MC and the PAC. Houses SCOOPS and the turnkeys, the Bombshelter and the Wild Duck Cafe.

CIBC: Canadian Imperial Bank of Commerce, campus branch (in the CC). See service charge.

Cinema Gratis: A variety of eclectic and popular celluloid is shown for *free* (hence Gratis) on Wednesday nights in the CC. Good fun, and you can't beat the price.

Club 750: Alias Fed Hall, the biggest student pub in Canada. Serves lunch during the day, and parties at night. Worth getting out to see. It's noisy, but you'll love it.

Co-op Student: A gypsy with books.

DavisWorld : Like the Eaton Centre with computers, DavisWorld is an adventure in colour, a twisty maze of tiny rooms, no two alike.

Endless Loop: See Loop, Endless.

Flaccid Tool: Mathie name for EngSoc accessory (batteries not included). Some disassembly required. Only useful to Mathies with great big beer bottles.

Feds: The Federation of Students, a campus-wide "organisation" that aims (and often misses) to represent the student body. Has useful services like SCOOPS and a cheap bus to Toronto on Fridays.

Fed Hall Bouncers: Big like tree, smart like rock.

Guelph: The sound a dog makes as it tosses its cookies.

IMP'TINT (Imprint): Preprinted birdcage liner, shipped in bulk on Fridays.

Loop, Endless: See Endless Loop.

Math: Your new Faculty, a great place for learning, meeting new friends and generally enjoying a productive and all-too-brief university career.

mathNEWS: What you're reading now. Math's student newspaper, a bastion of humour, bad puns, a little math, and even less news. Run by student volunteers.

MC: Home. The Mathematics and Computer building, located at the north centre part of campus. It's big, grey and cubic. A block of ice in the summer, toasty warm in the winter.

MC 3038: MathSoc's office, the place to go for social information, photocopies, and copies of old midterm exams.

Natural Log: The *official* MathSoc MathScot, the symbol of our society, essentially a laminated log but we love it anyway.

Needless Hell: (also Needles Hall) a place (and a thing) all co-ops pass through.

Oxymoron: Any set of words with a self-contradictory meaning. Classics include Postal Service, Good Morning, Civil Engineer, and Village Food.

Pink Tie δ : The other MathSoc MathScot, a symbol also used by the Faculty. Our visible symbol of pride (would you rather wear a twig?).

Recursion: See Recursion.

Rhursday: Day between Wednesday and Friday at UW.

Security: Have flashlight, will travel.

Service Charge: Zero account balance. See CIBC (also see Loop, Endless).

Village Food: Illustrates the difference between well cooked and cooked well. Food fit for a king (Here, King! Here, boy!).

Village One: The closer on-campus residence, laid out like a medium security pen, mostly single rooms.

Village Zoo: The other on-campus residence, deserving of its name, mostly double rooms.

Village Three: *(archaic)* Sunnydale, a quaint student ghetto north of campus. *(current)* The new University-owned townhouses on the north part of the campus, a.k.a. Columbia Lake Townhouses.

Watpubs: mobile Bombshelters, pubs held in various Canadian cities once a week for co-op students on work term and UW alumni.

Wild Duck Cafe: The CC dining emporium. See Guelph.

WLU: The high school down the road (Wilfrid Laurier University).

CS or Not CS

"I know software verification sounds a lot like Computer Science, but I don't want a Computer Science major. I want someone who can think. I want a math major."

– an anonymous corporate recruiter

Now that you've been accepted into Math, you may think your decisions are over, but they've just begun. If you haven't already done so, you'll soon have to choose a major. One of the most popular choices is Computer Science. This department usually has fewer spaces than applicants. Typically, of the roughly 800 Math Frosh (this means you) entering the University of Waterloo's Faculty of Mathematics, fully half intend to enter Computer Science in their second year. Of these, space permits about 300 to be admitted, of whom some 200 graduate with a Bachelor of Mathematics degree. Why is Computer Science so popular? What about the other departments?

For many people, computers were fun and programming came easily in high school. Others feel that in an increasingly technological society, it is necessary—even vital—to become part of the "computer revolution." Still others look to CS because of the apparent glamour and the lucrative job field.

Mathematics, on the other hand, is a labour of love. There is no apparent glamour for a mathematician. People study mathematics because they enjoy studying it, working with it, thinking about it. Many who enter Math at Waterloo without the intention of entering CS are steered here by advice from older friends or enlightened teachers.

What does it mean, both for Computer Science majors and for other Mathies, to have Computer Science and other Mathematics courses so strongly interrelated?

Since the theory of computing is mathematical in nature, CS students take mathematics courses. If they're good at math, they'll be good at the analysis and problem solving needed for higher level computer science jobs, like Systems Analysis. CS majors at UW are not taught specifically how to program, rather how to solve problems and what tools to apply.

In the first one and a half years of study, most honours programmes have a basic similarity. By the end of first year, all Mathies know everything that they need to know about programming. Like all Mathies, CS students will be exposed to calculus, algebra, statistics and subjects of that ilk. The required Math courses in CS programmes are intended to provide a basic grasp of the tools and methods of each discipline. Not only does this provide a future analyst with a solid background, but it gives CS majors, who may decide to leave the programme, exposure to the wide range of mathematical fields available.

By third year, most programmes have diverged radically. CS majors may opt at this point for a less mathematically-intensive program (or more so, if they prefer.) All Math programs become more flexible after the first couple of years, allowing for specialisation and interest-oriented study.

Every Math student benefits from CS courses through the resources they make available for study and research. With basic computer knowledge common to their classes, professors can employ the computer as a tool to let students apply the theories they have been studying. More realistic problems can be explored without using contrived examples where every step has an integer result. One does not have to be a CS major at UW to learn how to use computers productively.

The Computer Science program at UW is intended to produce analysts, not merely programmers. People who only want to learn to program should *not* be in a CS major degree at UW, but in CS at a community college. These institutions provide solid programming skills, but few of the tools needed to progress beyond coding jobs. The many Math courses that UW requires are not required there. A more in-depth education aimed at a DP management job or a job at a senior programmer level can be obtained at places like UWO. Beyond that, it is often the Waterloo-trained analysts and problem solvers, for whom coding is a tool used to accomplish a task, who progress.

Professionally, Waterloo Mathies (and even engineers) work well together. Thanks to the interrelated programs, CS grads can work with actuaries and statisticians and applied mathematicians with ease. This ability is denied many others in the CS field.

These are some of the reasons why CS and Math are so closely tied, and why CS majors must take the common Math core courses. UW wants to produce thinkers, not merely doers. Waterloo CS grads do not stay coders for long, but move into the thought-work areas of business as computer science applies to them.

At Waterloo you will be exposed to all the options of mathematics. Computer Science is a exciting part, but not the only area of interest. After all, mathematics has been around for millenia. The classic outsider view of mathematics as boring is far from accurate. The knowledge that there is always more to discover makes it exciting for both the dedicated researchers and the professionals for whom mathematics is a toolkit. Now and in the foreseeable future mathematicians will be developing the ideas that lead to discoveries in science, engineering and humanities—for mathematics is not just a science or technology, but a philosophy as well.

CS is certainly an excellent program here, but only one program among many, all of which are valuable and fun. Bear this in mind as you travel through your years here, and be open to new ideas. The Waterloo BMath is a document which signifies the bearer's ability to reason, to think as well as to do, and to program, no matter what discipline the major reflects.

Stuart L. Hodgins
W. Jim Jordan

Did You Know...

Did You Know...
(a.k.a. The UW 89-90 Undergrad Calendar)

1. ...the Imprint "is dedicated to the intellectual analysis and coverage of the news and issues of the day."

2. ...the whole rest of the world thinks a dot means the end of a sentence, while we know it represents a workterm.

3. ...an objective of the Federation of Students is "to act as the representative of the students."

4. ...Newfoundland, Hong Kong, India, and Central and South America are the only regions listed from where you already have to have completed at least one year of university to gain admission to UW. (Are we good or what?)

5. ...if you are good, the Senate of the University could confer an honorary Doctor of Divinity Degree on you.

6. ...the faculty of Mathematics has 8 miscellaneous policies covering 7 areas. This is more than any other faculty; actually about 8 more.

7. ...if you open the calendar exactly in the middle you can read all about your favourite faculty. No, not Science.

8. ...there were two Rec courses not offered in 89/90! That means only 44 to choose from!

Prof Quotes

It was only four years ago that the first ProfQuote was submitted, but they're probably the most popular feature in *math*NEWS and there's already a book of them out (available at MathSoc). The definition of a ProfQuote is something that an actual prof said in an actual lecture which is insightful enough, ambiguous enough or just plain funny enough to make it to print in *math*NEWS. All ProfQuotes are submitted by students (don't forget to submit yours!). To whet your whistle, here's a selection from the best of the best (does that make it the best of the best of the best?) ProfQuotes.

"A Cray is so fast that it can finish an infinite loop in three minutes."

P.A. Buhr

"Don't insult 1; it can't help it if it's its own square."

C. Cutler

"If I have not answered your question in 20 minutes, then I'll give you, uh, five cents."

McGee

"My, isn't this lovely data. Everyone should have data like this."

C. Cutler

"Then someone comes up to you and says, 'use the Cauchy-Schwartz inequality, Luke.'"

C. Cobourn

"Whenever I see a variable, such as X, I like to substitute a number, such as A."

Berman

"I don't know why people are laughing, is my fly open or something?"

M.A. McKiernan

"PETN is an explosive. It's used for...uh...explosions."

Mackey

"So here's an example using infinity-by-infinity matrices. Leave lots of room on your page."

P. Hoffman

"Styles are changing all the time. I don't like that. It means I have to buy a new tie every year."

Dunkley

"Put up your hand if the person beside you doesn't understand."

I. Munro

"You can bring any calculator you want to the midterm, as long as it doesn't dim the lights when you turn it on."

G. Heppler

"If my wife's giving me a hard time then you'll all fail."

J. Baker

"There is more to relationships than linear things."

Brendar

"I never have to remember that formula; I don't have to write the final exam."

P. Hoffman

"You can check that out on your pocket tool."

R. Wentzell

"It's not my fault that 20 years ago your parents couldn't find a drugstore that was open."

L. Smith

"You walk down King Street and ask someone for a power series, and they give you $\sum_{n=0}^{\infty} a_n z^n$, so that's what you work with."
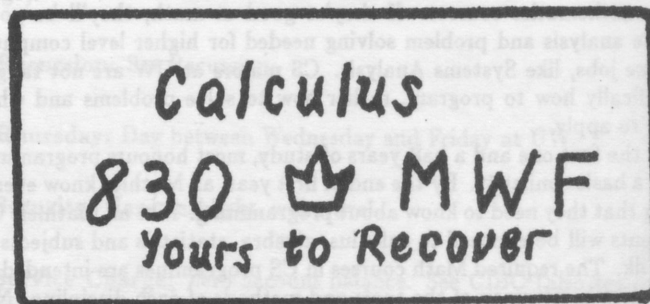
G. Cross

"Suppose you are stranded somewhere without χ-squared tables. Not a likely problem, but just in case..."

K. Shah

"I noticed I was quoted in your mathematics newspaper ... if the person who submitted that would step forward, I will give you your 'F' right now."

J. McCutcheon

*math*NEWS' Top Ten Excuses for Late Assignments

9. I had to remove all the vulgarities.

8. I sold the publishing rights on it to Penguin Books and they haven't sent it back yet.

7. Oh, I thought you meant September 22nd *next year*.

6. My horoscope said, 'Harm will befall you if you get everything done.'

5. My friend wasn't done his assignment on time, and I had to clone it.

4. I was too sober to finish it.

3. I have to walk past Laurier on the way here and I was mugged by a bunch of football players.

2. The 'e' key on my typewriter was busted and I had to look in a thesaurus for synonyms.

1. 50 dollars? I thought you said 20 dollars!

0. *I was reading* mathNEWS.

Football Warriors Slogan #5: We play to win! ... Would you believe tie? ...
Would you believe ...

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Fees
(and other four-letter words)

When you first looked at your fee statement, you probably noticed several things. You noticed that it was white and off-green. You noticed that it had your name printed on it. Then you noticed the line that said "Before Sep 08 Please Pay This Amount" and the number beside it: $1168.40 (less if you're in regular study). When you recovered, you probably saw the many smaller fees that make up this whopping total, and wondered what they all were, and more importantly if you really had to pay them all. Well, you don't actually have to pay them all ...

Fees You Have To Pay

Tuition: This is the basic tuition Fee, which covers the basic costs of the courses you'll take for the next four months. Individual courses may have other costs associated (such as lab breakage cards for chemistry labs), which will be assessed later, but most course costs are covered by this fee.

Co-op Fee: All Co-op students pay this fee to cover the costs the university incurs in handling the co-op program. Supposedly, the salaries of co-ordinators (who are supposed to find jobs for students, although it often seems to be the other way around), bookkeeping costs and other items are paid for by this fee. In fact, the university sets this fee, not the people in co-op, so don't complain to your coordinator that you're not getting $280 worth of services. This fee must be paid by everyone in co-op, regardless of whether or not you go through interviews in a given term.

Work Rpt Marking: Co-op students pay this brand new fee, yet another fund-raising scam brought to you by U(W). Since the amount of tuition that may be charged is limited by the government, the administration imagination enjoys discovering 'new' services to charge you for. You pay this fee every term, whether or not you submit a work report to mark.

Health Insurance: This insures both you and the university. The health insurance you buy helps cover insurance costs for the university, and you get a discount when buying prescription drugs (even on work terms) and other things. For more details, go over to Health Services and pick up their brochure.

Athletic Fee: This fee funds our intercollegiate teams (football, basketball, volleyball, swimming, etc.) in their support and operation, as well as tournaments and meets.

Recreation Facil: This fee helps to pay off the arena that was built awhile back on the north campus, up across Columbia Street.

Federation Hall: This fee goes toward paying off the very new student pub located on campus near Village One.

Fees That You Can Get Back Later

All of these remaining fees can be refunded by applying to the appropriate organisations within three weeks of the start of lectures. Most of these fees support interesting and worthwhile organisations, who are run by and for students and would love to have you join them and help them out.

You can avoid the hassle of reclaiming these fees by simply crossing them off and subtracting them from what you pay.

Waterloo P.I.R.G.: The Waterloo Public Interest Research Group, WPIRG, is a student funded public affairs group which has studied such things as nuclear waste and acid rain, and brought in speakers such as Ralph Nader.

Radio Waterloo: CKMS (in stereo) is the student run radio station here on campus, providing a wide variety of programming over a range of musical styles and subject matter.

Fed. of Students: All undergraduates at UW can belong to our Federation of Students, the "Feds." They provide lots of services, like Scoops, two pubs, legal services, a word processing service, weekend films (Fed Flicks) and more.

Student Society: This is your Math Society fee. MathSoc funds various services and events for mathies. See the article elsewhere in this issue for details.

Imprint: "Imp'tint" is a campus "newspaper" published every Friday. The quality of the paper is directly attributable to those working on it, and the quality goes up and down, but it often contains information of immediate relevance to the student population.

Fees for Fall 1989		
Fee	Amount	Notes
Must Pay these ...		
Tuition	$759.00	everyone pays
Co-op Fee	280.00	co-ops only pay
Work Rpt Marking	14.00	co-ops only pay
Health Insurance	21.00	regular students
	37.09	co-op students
Athletic Fee	26.46	school teams
Recreation Facil	10.00	
Federation Hall	7.50	
Refundable fees		
Waterloo P.I.R.G.	$3.15	
Radio Waterloo	4.00	
Fed. of students	19.20	
Math Society	5.00	a good deal
Imprint	3.00	

Numbers You May Need

Emergency	911
Kitchener Transit	741-2525
Gray Coach	741-2600
VIA Rail	(800) 268-9520
University Switchboard	885-1211
University Security	ext 3211
Health and Safety	ext 3541
MathSoc	ext 2324
Turnkey Desk	888-4434

Coarse Selections

Since most of you don't really know what your courses are going to be like, we've decided to tell you what they were like as various *math-NEWS* staff members have experienced them. Core first year courses and oft-chosen electives are covered here. For information on other courses, talk to an upper-year student. That's another good excuse to make another friend at Waterloo.

ACC 101: Accounting for accountants; this course can be pretty hard. If you haven't high school accounting, find someone who has to help you. If you have, you'll still have to work for this one.

ACC 121/122: Accounting for non-accountants. Easy if you have taken accounting in high school. There are some new principles in managerial accounting. These are the non-specialist counterparts to ACC 101.

BUS 111/121: Taught at WLU, these courses teach you the basics about the business world (and the stock market!) Business courses are WLU's speciality, and these two are always well taught.

CHEM 123: Introductory Chemistry. Follows from OAC concepts. Might get nasty towards the end of the term, but it can't hurt. You can take an optional quarter-credit lab with this course.

CHEM 124: This is an introductory course in organic chemistry. It is demanding and requires a lot of memorisation, but is quite interesting. There is also an optional quarter-credit lab for this course.

CS 131: a.k.a. Introductory Mouse Training. This course introduces you to the basics of computer science covering topics such as correctness and efficiency of algorithms, structured programming, recursion and data bases. Programming is in Pascal with some introductions to word processing, spreadsheets and data bases on the Mac. The lectures are passable, and the labs can be good or bad depending on how the servers are doing, and how your mouse is feeling.

CS 132: Intermediate Mouse Training. This course is the continuation of CS131. All the Computer Science a non-major never wanted to know. Topics include language syntax, compilers, data structures, dynamic storage and some elementary numerical analysis. Labs use Pascal and FORTRAN, with introductions to MAPLE and PWAP.

ECON 101/102: Slightly dry unless Larry Smith teaches, but beneficial. Easy to pass. Hard to ace. Lots of graphs, lots of reading (typical artsie course). Provides all the economics a non-major will ever need.

ENGL 109: English. For those of you that fail your ELPEs, it's one way of getting out of trying again. Little take home work, but lots of in-class essay writing.

FR 192 A/B: These courses are taught entirely in French and build upon OAC oral, reading, and writing skills. They consist of three hours of lectures, a one hour conversation class and a one hour listening lab per week. If you are taking these courses, you must write the French Placement Test in September.

MATH 135/136: These are the first year algebra courses. In MATH 135 you will learn classical algebra, a topic that began in ancient Greece. Included are such topics as set theory, number systems and how to send secret messages in a code that's impossible to break. MATH 136 follows from the OAC material on matrix algebra, but it takes it a lot further.

MATH 137/138: Better known as calculus. You'll learn about derivatives, evaluation of integrals, differential equations and sequences of real numbers. If you can find one, a set of course notes by Professor Wainwright can be extremely useful (they may even be one of the recommended texts). *Author's note: I liked them so much I took both of them twice.*

MTHEL 100: An ornithological monstrosity (i.e. bird course.) It deals mostly with contract law but also gives some instruction in the laws of tort and the structure of courts. A great deal of memorising is required to obtain a good mark. There are no theorems, no proofs, just facts to know.

MUSIC 100: Introduction to Music. This is a music appreciation course so you get to listen to a lot of music. Practice quizes help with the course studying. You get to do concert reviews, too.

PHIL 140: Introduction to Formal Logic. It's not so much Philosophy as Introductory Boolean Algebra. Generally easy for Mathies.

PHIL 145: Critical Thinking. This course teaches you how to analyse simple arguments for logical fallacies. It is interesting and not too difficult.

PHY 121/122: First part of course lulls you to complacency and the rest of the course totally blows you away. Don't take unless you have to or are a masochist. These courses also have optional quarter credit labs.

PSYCH 101: Introduction to Psychology. Register early to get in. Lots of memorisation. Easy to pass.

SCI 205: The infamous 'Hi-Fi-Sci' course that teaches concepts about stereo systems.

SCI 238: Star Gazing, alias Introductory Astronomy. Learn more about the heavenly bodies. Basic math, formula plugging, and a lot of reading.

Getting Around

Local, Private, Four Wheels

For those driving to school from off-campus, go to security the *first day* you arrive if you hope to get a parking space. If you don't pay the fee to have a spot, get used to paying 50 or 75 cents for daily parking, and remember to have some quarters in the car at all times. If you try to park illegally in loading docks or on the road, you generally have a half hour grace before you get the $25 fine, then another hour before your car is towed.

Local, Public

Public transit in this city is run by Kitchener Transit, often referred to as Kitchener Chance-it. This organisation runs about 15 routes in and about K-W, including UW. It costs $1.10 to ride the bus (bills are frowned upon, so this is a good place to use the new loon), but monthly passes are available if you plan to use the bus frequently.

For a list of useful bus routes you can head downtown to the head office or check out the display in the Campus Centre. The transit information number is 885-7373. You can use the "Telerider" service, too. Just call the number listed on the desired bus stop to find out when the next bus leaves from there.

The Federation of Students at UW have been running something called The Safety Van, which runs through most of the student residential areas. This service is designed to encourage women to stay off dark streets and pathways during the evenings; hence, the van is primarily for female students. This is a free service.

Inter-City

Aside from the usual VIA Rail and Grey Coach services, the Federation of Students runs a cheap express bus to Toronto on Fridays and from Toronto on Sundays. The new prices haven't been announced, but last year it cost $6.00 one way and $11.00 return.

Advanced Insanity?

"To be Honours, or to be Advanced, that is the question." This may be occurring to you now. For those of you who just checked boxes at random on your pre-registration form without really reading them, there are two different streams of honours Math courses. Most math students chose to take MATH 135/136 and MATH 137/138 however, there are advanced versions of these courses, MATH 145/146 and MATH 147/148, which are also available. The advanced courses cover the same material as the regular courses, but more rigorously and theoretically. Therefore, more work is expected and required, with more challenging assignments. As an encouragement to take these courses, the Math faculty has assured students that taking these courses will not significantly change the final marks that they would have gotten in the regular honours sections.

As if having two levels of Math weren't enough, the Faculty has now introduced 2 levels of Advanced Math. The M1 division of MATH 145/146 and MATH 147/148 is just a more in depth version of MATH 135/136 and MATH 137/138. It features the same text and topics, only with more theory and more challenging problems. The M2 division is what used to be all of 145/146, 147/148. It features a different text and takes topics deep into how and why mathematical concepts work. The content of the M2 courses can depend to a large extent on the profs teaching them, so talk to upper year students to find out what your prof is like.

Some advantages to taking the advanced courses are smaller classes (90-100 in M1 and 30-40 in M2), which more easily allows friendships to build and gives a more personal rapport with the professor; and the deeper understanding of the basic concepts that can come in handy in your upper years.

There are, of course, some disadvantages. The courses lean toward a more pure mathematics style, emphasizing the theoretical rather than the practical applications. Also, there is some tendency to lose contact with the rest of the first year students because of the separation of the courses. Therefore, some effort should be made in other courses to keep in touch with the rest of your classmates.

If you enjoy Mathematics, aren't afraid of a little extra work, and want a thorough understanding of some basic math concepts, then you should consider the advanced courses. To get a really good idea of what to expect, you should go to the information session on Wednesday, September 6 at 11:00 a.m. in DC1350. Then the instructors of the advanced courses will provide you with more information about their courses. The faculty has set it up so that it's relatively easy to switch from M2 to M1, and from 145/146 and 147/148 to 135/136 and 137/138 without doing any other damage to your timetable. Don't forget though that the Math 135/136 and 137/138 are challenging enough for most people—they aren't called Honours courses for nothing.

Talking to people who have taken 145/146 and 147/148, they have said that the deeper understanding they gained in the courses has helped them in second year. Most people are glad they took the courses. However, most people in the regular Honours sections felt that those were enough work that they would not have survived the advanced courses. Remember—the decision is yours and yours alone.

Lori Boomgaardt

St. Jerome's and Mathematics

I'm sure that some of you out there have chosen to study mathematics at St. Jerome's College. Here are a few pointers on what you can expect over the next few years.

St. Jerome's is a church college affiliated with the University. Students registering in any co-op or regular math programme can enrol at St. Jerome's. Those of you who have chosen the regular system of study will probably attend all of your first and second year core courses (MATH 135/136, MATH 137/138, MATH 235, MATH 237, CS 131/132, STAT 230/231) at St. Jerome's. If you are a Stream 8 co-op, you will take all of your first year and 2A core courses at the college. If you are in Math/CA, your 1A and 2A core math courses will be offered at St. Jerome's. However, those of you who are in 4 Stream will only spend your first term at St. Jerome's. Thereafter, the core courses which you require will not be offered at St. Jerome's during the terms that you are on campus.

Being at St. Jerome's, you will probably find that your classes are smaller in size (approximately 80 students in 1A) than those on the main campus (especially after 1A, when about 25-35% of the class goes on its first work term.) There are no lecture halls at St. Jerome's, and so your classes will be taught in classrooms (unlike the main campus where lecture halls hold about 200 students per class.) This may make it easier for you to adjust to university as the atmosphere won't be too much different than that of high school. It may also be easier to meet and get to know your classmates.

When you are enrolled at St. Jerome's, do make a point of going over to the math building occasionally to visit the C+D, use the library facilities or just to drop by MathSoc and use the stapler. Of course, don't forget to pick up a copy of *mathNEWS* on the occasional Friday morning (get there *early* to be assured of your copy). Also, most of the math clubs (eg. AM, CSC) have offices in the Math and Computer building, so drop by and see what's going on.

Getting Money

University is a very expensive habit to get into ($1170 for most just to come here). Even in the co-op program, some students find it hard to make ends meet. But do not fear, since there are some sources of income most students can tap into to help them out.

The Ontario Student Assistance Program, better known as OSAP is the greatest of these sources. All it takes is for you to get the proper forms from the Registrar's Office, fill them out, and send them in sometime in September. That's it. It doesn't cost a cent (okay, maybe $0.37 postage) and may bring in a grant or an interest free loan of untold magnitude. At worse, you may receive nothing but the joy of knowing you tried. Just remember, you can only apply for the first eight terms at school, so don't plan to use it going after your Master's degree.

OSAP isn't the only way to get money, though. There are numerous scholarships and bursaries listed in your Undergraduate Calendar that are often forgotten about. Take a look and see if you can qualify for any. Again, all it takes is a little effort and some luck.

If OSAP and the other prizes don't bring in enough for your lifestyle, there is always the opportunity to get a job. This one is particularly nasty since it will take time out of your study and leisure opportunities, but it is sometimes necessary. Jobs on campus include cashiers at the societies' Coffee and Donuts shop, designing and/or posting posters for the Feds, working in the arcade in the Campus Centre, selling ice cream at SCOOPS, working at FedHall, or typing for WORDS. Off-campus, there are numerous jobs in stores and restaurants that are customarily filled by students.

Again, a warning! Don't let any job interfere with your school work. That's why you are here, remember. Hopefully, mommy and daddy can come through with some dough before you have to fail out to earn your way through.

Co-op And You

Welcome to Waterloo, home of one of the best co-operative education programs in North America. This system will be affecting you for the next five years.

The first big question is just what is Stream 4 and Stream 8? No matter which stream you choose you will have to do eight straight months of school. An associated question is whether you want to do it during first year or fourth year.

Some people prefer Stream 4, which goes eight months straight in fourth year. The advantage of this is that you start earning your co-op money sooner and you can waste all of your high school earnings in the first four months. Others prefer Stream 8, which goes eight months straight in first year. The advantage to this is that you get it out of the way and when you graduate you have a better chance of getting a job with your last co-op employer. The choice is yours (except for some programs). When it comes down to it, it really doesn't matter much.

This next sentence will teach you everything you need to know about co-op. *Attend your co-op orientation (COOP 000) sessions*. These sessions, timetabled for each student, are run by the Department of Co-operative Education. Various aspects of co-op will be discussed there each week.

The process for getting a job is really quite simple. For those of you in Stream 4, it is also a little rushed. Those of you in Stream 8 don't have to worry about this until January, but continue reading so you can prepare yourself.

Sometime around the third week of September you will have to give the Department of Co-operative Education 20 to 30 copies of your resumé. No late resumés will be accepted. It is a good idea to have your resumé laser printed (no dot matrix printers). You may attach letters of reference, but if it's more than one page then it must be stapled together. No fancy covers or duo-tangs!

The *Want Ads* are probably the biggest classified section you'll ever read. You'll get your copy a few days after you hand in your resumé, probably on a Friday, and you'll have to tell the department what jobs you're applying for a few days later, likely the following Monday. You are not restricted to the jobs in your major, but you may only apply to 15 *Want Ad* jobs. The department will then send your resumé and your high school marks to the employer. For those of you in Stream 8, your high school marks will be sent out in January even though you will have a set of University marks by that time.

Late postings are the job descriptions from companies that didn't make it into the *Want Ads*. These will start the day after your *Want Ads* selections are due and are posted on bulletin boards in Needles Hall and the Math building. You may apply for as many of these as you like.

Don't go crazy applying for jobs. A half-decent resumé will net you interviews from half the jobs you apply for. At the time you'll be going through interviews (approx. October 11-November 10) you will be attending classes and writing mid-terms. If you have 10 or 12 interviews then you could very well end up living in Needles Hall for two weeks.

The interviews usually last from 20 to 30 minutes, but since they're usually running late you better budget on missing between $1\frac{1}{2}$ to 2 hours of classes per interview. The interviews themselves can be fun. Some students have been quizzed on their proficiency using a particular computer language. So, restrict the amount of lying you do on your resumé.

Remember that the interviewer should sell the job to you as well as you selling yourself to the interviewer. You're going to be spending 4 or 8 months of your life working at one company, so make sure you like them.

If you run into any problems at all *don't ignore them*. See or call a co-ordinator and get it all straightened out even if you feel stupid doing it. If you can't find your co-ordinator go to the MathSoc office and ask to see a Student Advisory Council rep. He or she should be able to solve your problem or tell you who to see.

For those of you that will have the opportunity of going through "second rounds", they can be very tense. You will probably feel that your life is in limbo, since you may not hear from anyone for a several weeks. Here are a few words of advice: constantly bother your co-ordinator (try and bug them two or three times a week); the jobs in second rounds are no worse than the jobs in first round (you have the same chance of getting a good or bad job); don't let the fact that you don't have a job affect your academic performance.

Co-op is a wonderful experience. Jobs are available in places as far away as Seattle, Washington and Atlanta, Georgia. Students have even gone to Australia and Japan. So, you can look forward to all the good times and good people you'll meet on your work terms.

The Acquisition of Textbooks

There are basically three ways one can purchase textbooks: from the UW Book Store, from the Used Textbook Store, and through private arrangements. The UW Book Store is located in South Campus Hall, which overlooks the southern entrance of the campus. All textbooks for your courses should be available there. As well, a list of required and recommended textbooks is maintained there. However, you can get a better price by buying used textbooks, and the there is a high probability that you will wait an extremely long time in the line-up to get in. The Book Store is a small place for the volume it has to handle in the opening weeks of the term. Here are some tips for shopping at the Book Store.

First of all, try to shop as early as possible, to be sure you get your textbooks. The Book Store tries to keep sufficient supplies, but it sometimes runs out of textbooks. Keep all of your receipts so that you can get a full refund if you drop a course or if you discover that you've bought the wrong book. There are two types of cashiers: those who handle cash only and those who handle cheque and credit card transactions. The line-ups for the cash cashiers tends to move more quickly than the other line-ups. (more line-ups, sigh!) Finally, the Book Store is partitioned into two areas during the first couple of weeks. Textbooks for math, science and engineering type courses are available on the lower floor of the Book Store. The entrance to this section is located at the back of the Book Store and can be easily identified by the line-up in front of it. The upper floor contains textbooks for the other (i.e. arts) courses, as well as stationery supplies, with access via the main entrance.

Should you wish to save some money on textbooks, there are two options you might consider. One is to watch the bulletin boards for people advertising used textbooks. The other is to check out the Used Book Store, located in the basement of the Campus Centre. However, you should not expect to get all of your required textbooks from these sources. And before you buy, make sure you have the right textbook and the right edition—all sales are final at these places. It's not a bad idea to go to the UW Book Store before checking out these places, so that you know what to get.

CYBERman
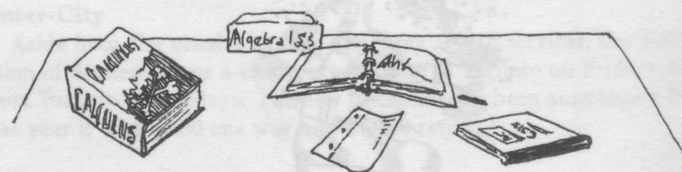
On-Campus Housing

It's very likely that you already have a place to live staked out in Waterloo, so why is this article here? You may want to live somewhere else before your days here are through, and there are quite a few choices.

Student Villages

UW has a housing office that can be reached through the switchboard (885-1211, if you haven't memorised it yet). They have information about nearly anything related to housing, both in Waterloo and in other cities where co-ops are common (Toronto, Ottawa, Calgary, etc.)

The largest on-campus residences are Village 1 and Village 2. Most frosh go into Village 2, which is essentially all double rooms. It is rather noisy—with about 50 people to a floor, parties and stereo wars are not easily contained. Village 1 is arranged in smaller cubical 'houses' with 15 people to a floor, so it's a little more civilised. V1 has almost all single and interconnecting (two rooms separated by a door) rooms. Residence fees for a term last year was $1752 for a double room, $1831 for interconnecting rooms, and $1883 for a single room. This is a per term rate and includes 21 meals a week.

Church Colleges

Waterloo has four affiliated or federated church colleges which run residences as well. St. Jerome's is the oldest of the four and has two separate residences: St. Jerome's, for men; and Notre Dame, for women. It is sponsored by the Roman Catholic church. Renison College is the Anglican college on campus, and, like St. Jerome's, it has separate residence buildings for men and women. St. Paul's College, sponsored by the United Church, has a large residence and associate program, and Conrad Grebel College, operated by the Mennonite church, has a smaller residence and associate program. Residence fees for each of these run around $1850 per term, with varying numbers of meals depending on the college. Some colleges may have single rooms available.

Waterloo Co-op Residences

The Waterloo Co-operative Residence (WCRI) is student-owned, and operates independently of the University of Waterloo. You do not have to study under the co-op system to live at the Co-op residence; the word "Co-operative" here means that the residence is owned and controlled democratically by the students who live there.

WCRI is made up of 7 divisions. North, South, B-Division, Kershaw, Clayfield and Carver are all on Phillip Street. Dag Hammarskjold (the Hammar for short) is on University Avenue. North, South and Hammar are co-ed residence divisions with both single and double divisions offering 1 to 4 bedroom apartments. All divisions are within five minutes' walk from campus.

The residence divisions have dining, study and recreation rooms as well as laundry facilities. Each floor has a lounge and a kitchenette (stove and fridge, pots, pans and utensils). Lunch and dinner are served every day in the dining rooms. Residents can make their own breakfasts and snacks in the kitchenette which is stocked with food by the residence for this purpose. That way, it doesn't matter how early or late you get up—you always get breakfast.

Each resident is responsible for the cleanliness of his own room, shares the responsibility for the cleanliness of the common areas and contributes toward the operation of the Co-op. Residents in all divisions do work duties ranging from one to three hours a week, worked in around your school schedule. Duties include serving meals, mopping floors, washing dishes, writing for or editing the WCRI newspaper, or taking part in the management of the Co-op. By having residents do work duties, fees are cheaper than living on campus.

You usually can't get a single room at WCRI unless you've lived there a couple of terms because rooms are allotted based on seniority (the number of terms you've lived at WCRI). Double rooms and large singles (a double with only one occupant) are pretty easy to get in the winter and summer terms, even if you haven't lived there before. In the fall term, large singles aren't available, and you should apply well in advance for doubles or singles (say March or April if you have no seniority).

For more information on the Co-op residence call 884-3670 during business hours, come to the office at 268 Phillip Street, Clayfield Division, Block 2, or write to:

Admissions Co-ordinator
Waterloo Co-operative Residence Inc.
268 Phillip Street
Waterloo, Ontario
N2L 6G9
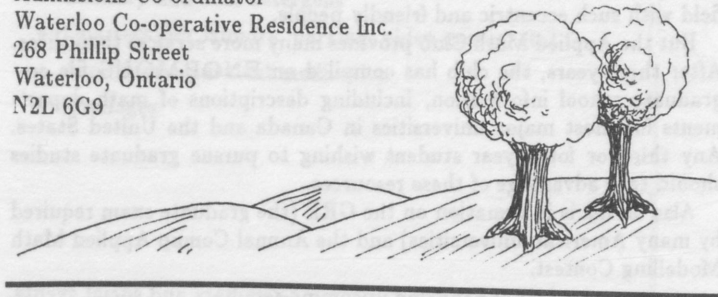
Off-Campus Living

While it can be an advantage to live in the Villages for at least one's first year, living off-campus also has its advantages. It's usually cheaper, and you generally have more room and freedom. You also have more responsibility, and cooking and cleaning can add a few hours a week to your schedule.

There are many possibilities for off-campus living. You might find a room in a family's home, or have an apartment or townhouse or some such flat. In any case, the first person you will be dealing with is *the landlord*. Some are very understanding and can be very obliging. Others can be downright difficult to please. Just remember, if something goes wrong, consult the legal resources office in the Campus Centre *immediately*. If you're polite to the landlord, pay the rent on time, and obey the rules, you should have no problems.

If you are getting the lease, you may find it necessary to sign for a minimum of one year. Even if you are in the co-op program, you can usually find reasonable students to sublet to while you're working out of town. Even if you're the ones subletting, you can often make arrangements to return to the same place when you return to campus from your work terms.

Most places will require you to bring your own supply of sheets, blankets, pillows, and possibly furniture, cooking utensils, and an initial supply of food. You should also bring a few of your Mom's favourite recipes to get you started (and maybe a fire extinguisher if it's your first time cooking).

If you haven't found a place yet, keep checking with the Off-Campus Housing Office over top of Village One. They have housing lists for Kitchener-Waterloo as well as for other large cities in Ontario (for when you go off to work for a few months). Additional rental listings can be found in the *Kitchener-Waterloo Record* and in a flyer called "Read it'n'Rent." Housing boards are located throughout the campus, notably at the Campus Centre, outside the MathSoc office, and in Carl Pollock Hall. Ads for housing both available and wanted are posted on all of these boards. The reasonable price range fluctuates, but you can expect to pay between $200 and $275 a month for a livable (but not luxurious) place, depending also on furnishings and location. Don't forget to take into account utilities when calculating how much its going to cost you (can be more than $50 a month per person during winter terms). Shop around before you take a place, but remember that good deals can be snapped up fast!

Extra-Curricular Organisations

Applied Math Club

The name "club" can be misleading. The Applied Math Club is an entirely student run organisation whose main intent is to provide a number of crucial service to applied math undergraduates as well as grad students and faculty. The numerous seminars the club presents serve to give students a taste of what is happening in different fields of Applied Math usually with references to modern research. Every term the club organises a main social event like the *coffee and tea party* or the annual *Summer A.M. barbecue*. It is here that students and faculty alike can discover how exciting it is to work in such a dynamic field with such eccentric and friendly people.

But the Applied Math Club provides many more services than these. After three years, the club has compiled an ENORMOUS file on graduate school information, including descriptions of math departments for most major universities in Canada and the United States. Any third or forth year student wishing to pursue graduate studies should take advantage of these resources.

Also on file is information on the GRE (the graduate exam required by many American universities) and the Annual Comap Applied Math Modelling Contest.

Watch for posters announcing upcoming seminars and social events, and if you think you help out to ANY degree please drop by the club office, **MC 5168**. It does not take much work to aid something that everyone will be proud of.

Computer Science Club

The Computer Science Club welcomes you to Waterloo. We're a club for everyone interested in any way in computers. Memberships are affordable even to university students, and we provide members with access to our up-to-date library of computer reference books, an account on our Unix minicomputer, a 10% discount at the Computer Book and Supply Centre, and intelligent conversation on almost every topic. Aside from all this, we provide consulting (help) to everyone, members and non-members, who needs it, and we invite interesting people to speak at our meetings, which are also open to everyone. Drop by our office (MC3037, across from MathSoc) anytime, have a cup of tea and become a member!

Campus Rec

Campus Recreation is . . .

- the largest student employer on campus
- full of job and volunteer opportunities
- free to every student
- archery, windsurfing, fencing & kendo, badminton
- co-rec broomball, volleyball, slo-pitch
- competitive basketball, hockey, soccer
- loaded with individual activities
- a place for relaxation, good time, and friendly people
- fun, fun, fun
- yours to enjoy!!!

Get yourself a copy of the campus recreation brochure and be sure to get your term off to a great start!!

FASS

Do you want fun? Do you want frolic? Do you want good times? If your answer to any of these questions is yes, then you want to become a part of the longest running, most outgoing group on campus: FASS.

FASS is made up of Faculty, Alumni, Staff and Students; almost everyone falls into one of these categories. Having so fallen, pick yourself up, dust yourself off and proceed to your local FASS meeting.

Every year FASS members get together to write and perform a musical comedy spoof of life at UW and life in general. It doesn't matter if you have never been in a play before or if you have a terrible case of stage fright or cannot sing a note: FASS has a place for everyone.

FASS needs actors and non-actors. There are a lot of other folks who are part of FASS and are never on the stage. A large support crew is needed to scrounge props at local garage sales, find costume bargains at used clothing stands, build sets or help write the script.

The script has been in the works for five months, writers meetings will be happening approximately twice a week. The call for cast and crew is in the first week of January. The show is for four nights (five shows) early February to an audience of hundreds each and every night. To keep amused, FASS has legendary parties! Since FASS is an all-volunteer troupe, FASS members think of the people they meet and the parties as payment for putting on the show.

FASS is calling you. Watch for posters announcing writers meetings and the general meeting which is held early in the term. Check the Imprint, Gazette, and mathNEWS Calendars of Events for more details or drop us a note in the FASS office (HH177A) or by electronic mail (fass@watmath) if you have any questions.

Warriors Band

Since 1966, the Warriors Band has been appearing at UW athletic events to provide musical support for the good guys (and terrible puns for the bad guys).

The Band plays a football and basketball games, although we try to attend games in other sports and the occasional civic function such as the local Santa Claus parade. We fire up the Waterloo teams and their fans with a selection of fast, loud songs and biting, yet clean chants.

A lack of musical ability has never stopped anyone from joining the Warriors Band. We can always use people with violent tendencies to hit the bass drum or smash the cymbals. Even if you left your Sousaphone in Saskatchewan, the band has a limited number of instruments that can be used during games.

To get involved with this fun group of athletic supporters, show up at any Warrior football or basketball game or watch for notices announcing our practices at the beginning of the term.

Other Things

The list above only contains a few of the clubs that sent us information. There are many many more clubs on campus that you can get involved in. For those interested in playing games, there are clubs for Scrabble, Chess, Go, and Role-playing games. For those interested in politics there are clubs representing a variety of views from the very radical to the mainstream. As well, there are a host of organisations on campus that you can get involved in, including MathSoc and the Federation of Students.

Whatever your tastes, there is probably something for you! So look around when you get here, and get involved.

Survival Kit

As you prepare to venture into unknown territory, you need to know what the essentials of life at UW are. Besides the obvious (a stereo system of some sort–preferably small but *powerful*) here is a list of items you may find helpful. This list is *not* meant to be comprehensive, only to suggest ideas. Remember, for most of us, it's a long way home!

Things you should bring from home

Well, anything you can fit in your gear that the folks won't miss for at least a week. Among these items:

Official Papers

- Registration and fee statement *(vital)*
- Bank books and cards, chequebooks, etc.
- Parking stickers, PAC card, Health Insurance cards
- ID, e.g., driver's licence, SIN card
- *mathNEWS*Frosh Issue (but of course)

Clothing

- Clothing for hot weather, cold weather, rainy weather (heh, heh), snow gear if you won't be home 'til Christmas or later
- Umbrella and K-way (heh, heh)
- Interview clothes (business best) for co-ops
- Sewing kit for quick minor repairs

Other Stuff

- Money (lots, see articles on money elsewhere)
- Towels, sheets, blankets and pillows
- Small kettle, cups, dishes, cutlery (more for those not getting room and board)
- Alarm clock (unbreakable, with snooze bar for 8:30 classes)
- Toiletry items (enough to last until you buy some here)
- Your bike (UW has excellent bike access)
- Bicycle lock (UW has excellent bike thieves, too)
- Posters, if your landlord allows
- Favourite stuffed animals (but beware of hostage takings, etc.)
- Calculator (scientific) and mechanical pencils

Things to buy when you get here

No, we're not getting a cut from the Chamber of Commerce. It's just not worth the hassle of hauling this crud when you can get it here.

Stuff

- Paper, pens, binders, erasers, rulers, pencils (why not start fresh–leave that high school gear at home)
- Alka-Seltzer (see Village Food, see also Guelph)
- Basic tools (screwdriver, bottle opener, etc.)
- Laundry and dish detergent
- Quarters (for laundry, parking, video games, etc)
- Aspirin or equivalent medication
- Bandages
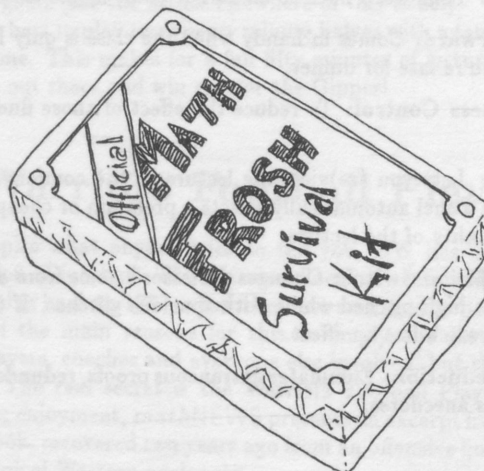
Official MATH FROSH Survival Kit

The Prof Control Panel

Mark II

The University of Waterloo will be installing the *new* Prof Control Panel in various desks throughout the university on a trial basis in order to try to improve class attendances. Here is a brief excerpt from the operator's manual accompanying each panel.

Prof Eject Button: For that boring part of the lecture when you just want to send the prof through the roof.

Prof Nuke Button: Similar to the Eject Button but with a more dramatic mushroom cloud effect (usually takes out the first two rows of keeners as well). Radiation suit not included.

Prof Zapper: A quick charge of 500 000 volts can easily tell a prof to get on with the lecture.

Prof Volume: Allows you to sit in the front without shattering your eardrums, or to sit in the back and still hear the prof.

Prof Rewind: Time warp back to an earlier point in the lecture.

Prof Fast Forward: Comes in handy when the class is only halfway through and you're late for dinner.

Prof Brightness Control: To reduce the effect of those fluorescent Friday ties.

Prof Record: Lets you (re)view the lecture in the comfort of your own home. The Panel automatically selects a premium or cheapo tape, based on the quality of the lecture.

Prof Stereo/Mono Switch: Changes professor's voice from a monotonic drone to a high-pitched whine with spurious glitches. If the prof is female, this switch has no effect.

Prof Noise Reduction: Eliminates extraneous proofs, redundant lemmas and useless anecdotes.

Prof Balance Control: Allows the student to adjust the lecture's theory *vs.* practice ratio.

Prof Language Select: Choose one of Chinese, Czech, Farsi, Swahili, Esperanto, Basque or Pidgin English.

Prof Font Select: Choose from a gallery of blackboard fonts: Greek, Hebrew, Zapf 'Dingbats', Bodoni, Old English or Cyrillic.

Prof Gear Selector: Choose 'D' for normal lecturing, 'L' for low-gear grinding through DE's, 'R' for "if and only if" proofs, or 'N' for catching your breath after an exhausting example.

Prof Cruise Control: Set the most comfortable cruising speed for the lecture. We advise setting the speed below the legal limit of 50 (boards per lecture, that is). Failure to do so will void the warranty.)

Prof Motion Trac-ball with Plane Control$_{TM}$: Move your prof around in 3-space with an ergonomically designed Trackball and continuously variable oblique Plane Control$_{TM}$. During rougher lectures, drive your prof up the wall; during better ones, help him reach that top blackboard in MC 2065.

Directional Derivative Switch: Used in conjunction with Trac-ball and Plane Control$_{TM}$ to send the prof off on a tangent.

C+D Control: Signal the C+D to beam in the beverage and snack of your choice.

Georg, Vainamoinen and Jordankovic
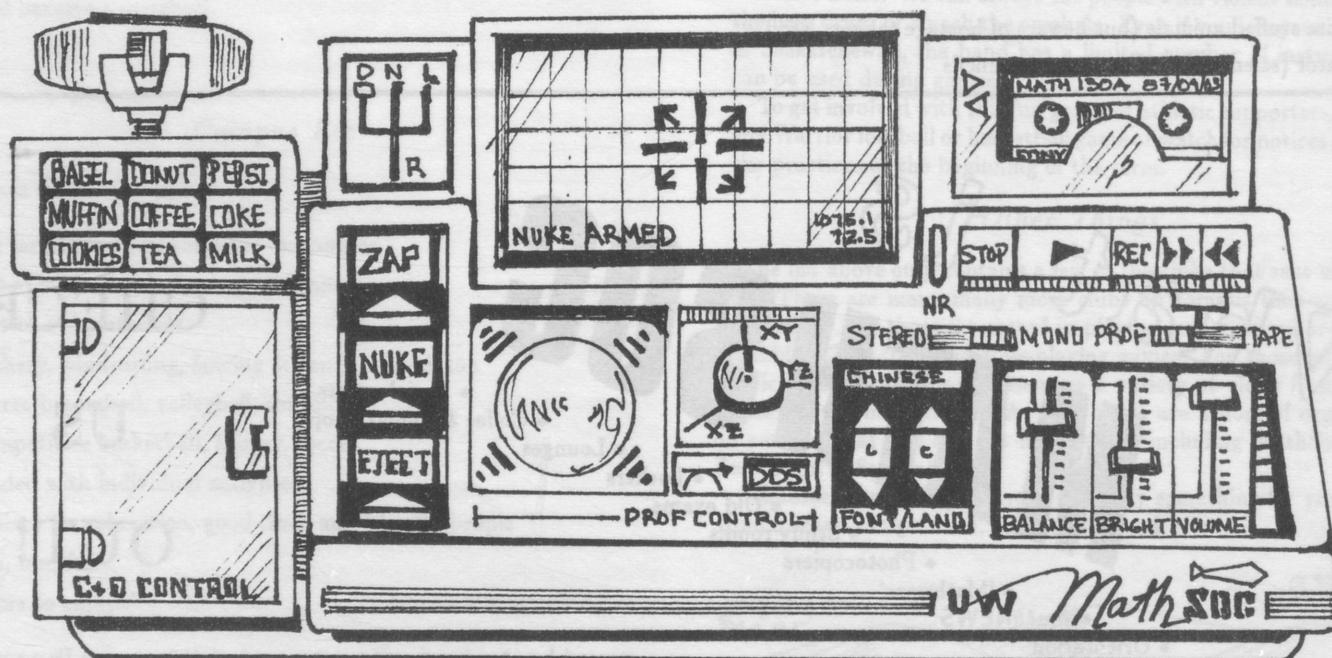
Keener Bingo

You will soon learn that on occasions lectures become, well, less than interesting. For those times when counting ceiling tiles seems more appealing than the Diophantine equation on the board, we present: Keener Bingo.

To begin, we must clarify the definition of a keener. They can easily be spotted in the front rows of any class, where they are noted for their remarkable ability to ask an unusually large number of confusing questions during a lecture. They often bear an uncanny resemblance to characters in "*Revenge of the Nerds.*" Standard keener equipment includes: a bulky briefcase, checkered trousers, undershirts and a powerful calculator. Optionally this can be a very powerful calculator such as an HP 41CV with card reader, printer, and optical wand. Other optional keener accessories include: a plastic pocket protector for the front shirt pocket (containing six different coloured pens, several mechanical pencils, a screwdriver and a pencil sharpener), a slide rule, a complete geometry set, and a well-used flowcharting template. Should all this not give them away, keeners tend towards extra long right arms (for better visibility), tape on their glasses, wearing T-shirts or buttons displaying the first 200 digits of π (which they know by heart), and having twice as much stuff in the briefcase as can possibly fit.

The act of being keen: you will come to be painfully familiar with this procedure. When the prof asks a question, makes a good point, omits something, or even for no reason at all, the keener will thrust his or her hand skyward and attract the prof's attention. This is almost always followed by a vapid and irrelevant question which serves only to confuse the class and often the prof.

The Rules: Pick out three keeners and write their names (class nicknames will do) on a piece of paper. As the keeners are keen, cross off their names. The first person to cross off every keener on their list yells "BINGO" and is awarded one bingo point. Play the game over several classes or several weeks and the winner is the person with the most points at the end of that time. For a more challenging game, arrange the names of nine keeners in a 3 by 3 grid. The winner is the person who first crosses off the names of three keeners in a horizontal, vertical or diagonal row. In both versions, the following rules apply:

- You may not use your own name, nor may you repeat names on the same card.

- An extra point is awarded if you preselected the keeners in the order that they were keen.

- Double score if you can guess their first words, such as "Sir...Sir...", "Professor...", "But...", "Excuuuuse me...", or the always popular "You forgot...".

- Triple points if the prof spots the keener but refuses to acknowledge his or her presence.

- Quadruple points if the prof threatens the keener.

- You are not allowed to physically abuse a keener in order to affect the placement of his or her hand.

- Bribes are illegal.

Before you begin, you may want to have a look at a keener at close range. Pay a visit to the EngSoc Orifice at Carl Pollock Hall. Happy hunting!

Prof Football

This classroom distraction comes to you from Wilfrid Laurier University where there is a rich football tradition. Perhaps we should modify the rules somewhat and call it Prof Rugby or Prof Basketball to honour our best teams, but then maybe this year will be the big year for our Warriors Football Team ... and maybe it will snow next July!

The only requirement for this game is that it be played in a lecture with a prof who paces. Before the lecture begins, divide the class into two teams. For example, use the aisle in the middle of the room as a dividing line. You must also mark two goal lines at the front of the class. Do this by placing a piece of tape or other marking on the blackboard or front wall about one or two metres in from either side wall. When the prof arrives and the lecture begins, you can start playing Prof Football.

The object is to score a touchdown, which occurs when the prof crosses the goal line in front of your half of the class. The opposing team can try and prevent a touchdown from being scored by attempting to attract the prof to their half of the classroom, and then possibly score a touchdown themselves! The best way to attract the professor's attention is to raise your hand and ask a question. This requires some imagination because the question should be relevant and so must be thought up on the spur of the moment. Watch out though, because asking a lot of confusing questions could make you part of a keener bingo game (see the article elsewhere in this issue.)

It is best to play two twenty minute halves with a ten minute break at half time. This makes for a full fifty minutes of lecture entertainment. So, go out there and win one for the Gipper!

Warriors Football Playbook

Despite what anyone tries to tell you, UW has a long and proud tradition of football. The Warriors Football team has a perfect record stretching back to 1983, when they last managed to beat another team. One of the main reasons for this is simply the sheer enthusiasm of our players, coaches and everyone else involved, but there's more than that. The real secret is the Warriors Football Playbook. For your viewing enjoyment, *mathNEWS* presents an excerpt from the Warrior's Playbook, recovered two years ago from an offensive lineman decimated in a typical Western onslaught.

Signal	Called	Play
42	Red	Off-Tackle Fumble on 2
63	Baker	All Ineligible Receivers Go Out for a Pass
14	Blue	Illegal Procedure on 'Set'
21	Green	Double Surprise Fake Punt
8	Yellow	Quarterback Sneak Back Ten or Fifteen Yards and Get Tackled
11	Black	Pass to CHCH-TV cameraman
12	Orange	Reverse to Goal Line and Concede Safety
67	Able	Complete Pass to Wide Receiver as Centre holds Linebacker
82	Yellow	Halfback Trap on Fumbled Snap
37	Blue	Miss Field Goal Attempt on Second Down
19	Red	Lateral Ball to Closest Lineman

GOTTA GET THIS JUST RIGHT...

IT'S THE TRICKIEST PART OF FLYING mathNEWS MISSIONS...

IN-FLIGHT REFUELING.

GRIDWORD

Across

1. Campus pub (11)
7. Spot on a die (3)
9. Yours will be quickly deflated (3)
10. Lowest known form of vegetable life (8)
11. Wire service (abbrev.) (2)
12. The MacLab uses one (3)
13. Cowardly dog (3)
14. The engineers and mathies each have one (4)
17. One in the batting order (abbrev.) (2)
18. Incompetent, incapable (5)
19. It will enable to finish your work (8)
20. Hindu goddess of destruction (4)
22. An elected representative (5)
23. A small warship (7)
26. To soak or steep (5)
27. Exam preparation technique (4)
28. Final exam month (Fr.) (8)
30. You'll see a lot of these in Calc. and Alg. (5)
31. Member of a yoked team. (2)
32. One of your gods for the next four months (4)
35. Faculty MathScot and well-known function (3)
39. The real name for DavisWorld (abbrev.) (3)
40. Garbage goes here (2)
41. This wonderful metropolitan centre (8)
42. In Latin, thus (3)
44. Foot part (3)
45. Dean of the faculty (11)

Down

1. Many of these will be consumed in frosh week (5)
2. Method by which your profs derive difficult results (5)
3. Ride the wave at this function (4)
4. Particularly slimy engineer subspecie (abbrev.) (4)
5. Home of the Dome (abbrev.) (2)
6. An assignment extension (8)
7. Favourite prof suit fabric (9)
8. Other Faculty MathScot, you'll have to wear one (7)
11. Chemical symbol for gold (2)
13. Students aren't popular in this country (5)
15. Suffix for Hi-Fi and Sky (courses) (3)
16. At a distance (with *from*) (4)
17. From french (2)
21. Your CS course is one (9)
23. A movie shown in AL on the weekend (8)
24. In disguise (fig.) (5)
25. Opus' instrument (4)
26. The campus rag (7)
27. You won't have any of this after an all-nighter (3)
29. The CNE (2)
33. You should be aware of regulations (5)
34. You are one (5)
36. Not off (2)
37. Less than whole (4)
38. It is good and right that you are the least of all. (4)
43. The cave where they keep the engineers. (abbrev.) (2)
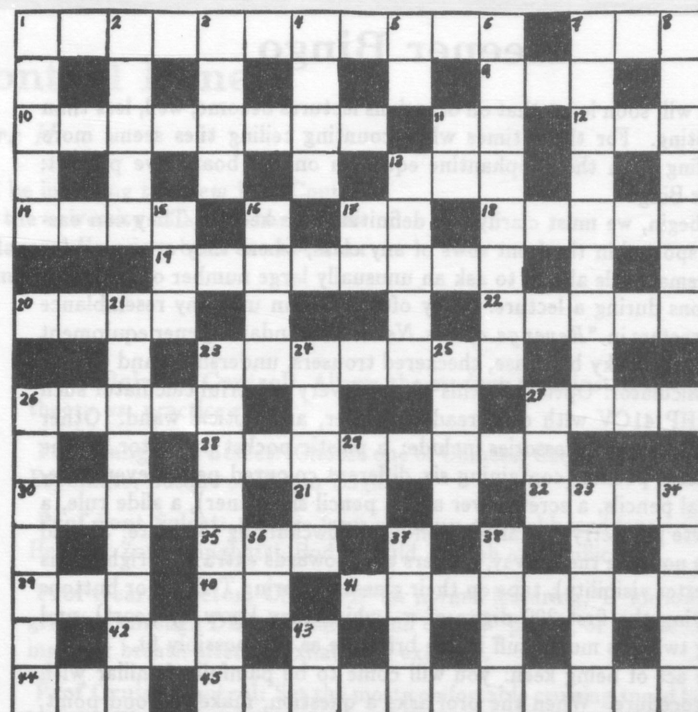
Introductory GridComments

GridWord 101

Welcome, frosh, to your $n, n \in \{3, 4, 5, \ldots\}$ year stay at U(W). This is your GridMaster speaking, and if you will please extinguish all smoking material, we will be under way as soon as we receive clearance from the Editor.

The GridWord is a regular feature of *math*NEWS, providing you with hours of Friday-morning diversion while your Calculus prof drones inexorably to some unknown goal. This GridWord is designed to contain some ideas that you, as a frosh, will find important. The answers for the grid appear elsewhere in this issue.

The regular GridWord differs from this in two important ways. First, the regular GridWord is somewhat of a competition. Readers submit their solutions to the grid, and from the pool of correct submissions, a winner is drawn. (Obviously the solutions do not accompany the grid.) Second, the GridWord will usually have cryptic clues (this will be explained, I promise...), with conventional clues as well or instead, depending on the skill of the GridMaster.

In the meantime, I hope that you find this puzzle an enjoyable introduction. Have fun during Orientation week and party hard - it may be a while before you can afford to again.

Lord Djaws of the Rimward Deeps

mastHEAD

MATH ORIENTATION '89

FIRST, you MUST register to attend any Math Events!!

So, on Tuesday, September 5th, 9:00 am till noon
Go to the Third Floor Lounge of the
Math & Computer Building (MC)
and purchase your FROSH package for $30

Bring your lock.
Lockers are available
for the week in the
Math & Computer
Building (MC), on
the third floor.

Events include:
 Drop-In Centre
 Fed Pep Rally
 Off-Campus Roadtrip
 Frosh Orientation Program
 Meet-Your-Prof BBQ
 "Jungle Madness"
 Magical Mystery Tour
 Scavenger Hunt
 Volleyball/Baseball Tourney
 Casino Night
 Elora Gorge
 Family Night Out
 and much, much more...

Handicapped? Need help getting around? Call Verna Keller at
(519) 885-1211 Ext. 3620 --She's expecting to hear from you.

Orientation Director's Message

Congratulations on being accepted to the Math Faculty at the University of Waterloo.The Math Faculty has earned itself one of the most prominent reputations for academic excellence the world over (no kidding!!).

Math Orientation has also earned a reputation for providing hundreds of frosh with the opportunity to get to know fellow frosh, the faculty and other students. Plus, you get a week full of fabulous events and good times!

The Math Orientation Committee consists of nearly one hundred upper year students who have volunteered their time and effort to organize a week of funfilled activities for you. To help you through the week's activities, you and several other frosh have been grouped together into "families" headed by 2 or 3 committee members, referred to as your Big Brothers and Sisters. Your Big Brothers and Sisters can help you adjust to university, answer your questions, and provide lots of useful advice. Hopefully, the friendships you form will last all term and beyond.

In the following pink pages you will find advertisements for all of the events throughout Orientation Week. Here is a quick rundown: you will be playing and dancing at Bingeman Park, hunting for wild animals at the "Jungle Madness" Pub, doing something (?) at Magical Mystery Tour, searching for lost articles in the Scavenger Hunt, gambling at Casino Night,

swimming and relaxing at Elora, and finishing off a great week with movies Sunday afternoon.

So--how do you get in on all this action?? Simple!! Come to the third floor of the Math & Computer Building (MC) on Tuesday, September 5 and register by purchasing your frosh kit. In your frosh kit you will find your very own official PINK TIE, a designer original (?) frosh T-shirt, free tickets to events, buttons, and all sorts of neat paraphernelia. Be sure to wear your PINK TIE all week--it admits you to any and all Math Orientation events (yes, there is another reason, besides pride, to wear it).

When you pick up your frosh kit, be sure to look for your Big Brother and Sister (their names are given on the letter you received). To help you find them, they will be wearing PINK shirts with their names on them and their pictures will be displayed on the picture board on the 3rd floor. You can also enjoy free coffee and doughnuts while you get to know other members of your family.

All this excitement does not end on Sunday. The Math Society (MathSoc) sponsors events all year long, and you are encouraged to get involved. Ask your Big Brother or Sister for details if you are interested.
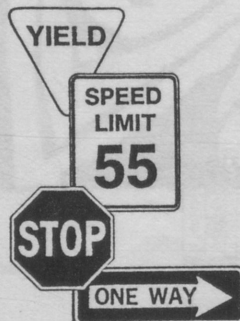
See you in September....

Shelly Ruth

Shelly Ruth, Chairperson
Math Orientation '89

Tuesday
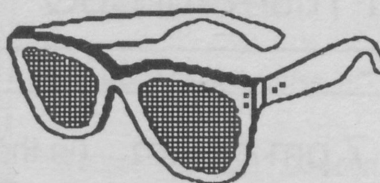
Register first at the Drop-in Centre and then.....

The Federation of Students presents.....
A Pep Rally and Playfair
12:30 - 2:30 pm in the PAC

All Mathies meet under the Big Pink Tie at 12:15 pm

Then...

We're going on a trip to...

BINGEMAN PARK

GoCarts, Waterslides, Bumperboats, MiniGolf,
WavePool, Giant HotTub, and More!!

FREE FOOD!

GREAT PRIZES!

(Admission included with purchase of Frosh Kit)

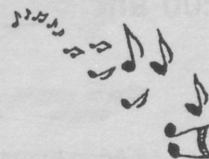**All ending with a huge wet/dry dance in
Bingeman's Marshall Hall**

First buses leave at 3:30 pm from the Math Loading Docks
(Last buses at 4:00 pm)
Return home between 12:00 am - 1:00 am

This is an All Ages Event
(proper ID required to drink)

Wednesday

Drop-In Centre   9:00 am - 4:30 pm   Another chance to register and meet your Big Brother and Sister

... or, at about the same time

Breakfast With The Dean   10:00 am - 11:00 am
Davis Centre
Great Hall

FROSH ORIENTATION PROGRAM
SPONSORED BY THE FACULTY   11:00 am - 4:45 pm

Meet-Your-Prof BBQ   5:00 pm - 6:30 pm
Columbia Field

ELPE 7 pm - 8 pm   (in the PAC)
English Language Proficiency Exam

Bring Picture Identification

(Yeah, I passed! / S----, I failed) where's the party?

"JUNGLE MADNESS"

A Safari Theme Pub at South Campus Hall

8:00 pm -
1:00 am

Hymie

This is an All Ages Event
(ID Required To Drink)

Thursday

University Registration

9:00 am - Noon in the PAC

- Pay tuition fees (bring cheque & ID)
- get photo ID taken

Presenting the one, the only...

Magical Mystery Tour

Our BIGGEST and BEST event !!

FREE FOOD!! FREE DRINK!! FREE PRIZES!!

"You won't want to miss it!!"

First buses leave at 12:00 noon from MC Loading Docks
Last bus at 12:30 pm

This is an All Ages Event

its time for a... # SCAVENGER HUNT

Venture into the unknown to search for wild and wonderful things!!

GREAT PRIZES!

7:00 pm - 7:00 am (or whenever you finish!)
Meet on the Third Floor MC

Friday

Volleyball/Baseball Tournament

Serve, Spike, Swing and Slug
along with your new friends from
Science!!

Noon till 4:00 pm
Columbia Field

Then...

Casino Night at Federation Hall

It's time for Big Time Gambling!
The Cash is Fake, but the Fun Ain't!
With Thousands of Dollars Each, try your luck on ...
Craps, Black Jack, Lucky 7, Crown & Anchor ...
win spot prizes or just dance the night away
at the Largest (and most expensive) University Pub in Canada!
(Ask your Big Bro/Sis where to meet.)
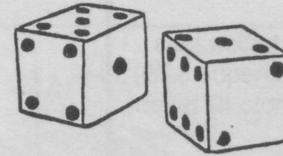
It all starts at 8:00 pm
Bring your ticket from your Frosh Kit

This is an All Ages Event
(ID required to Drink)

Saturday

Shinerarama... A University Tradition!

Wash Cars
 to Raise Money for Charity
  Beat Laurier in A University Challenge!
(free BBQ lunch at Elora for all participants)

Buses leave at 9:00am and proceed directly to Elora following Shinerama.

Then...

Soak Up The Sun at   1:30pm – 4:30pm

Elora Gorge!

Bring A Towel And SunTan Oil...
We're Off To The Beach!

(Buses leaving from Shinerama)

Family Night Out!

Get Together With Your Big Brother and Sister and
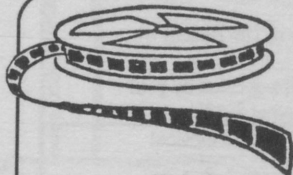### Plan a Family Get-Together

WOW!

- see a movie
 - go to dinner
  - throw a party
   YOU decide!

This is an All Ages Event   8:00pm – ???

Sunday

Finally...

Wind Down With A quiet Afternoon At Federation Hall
As We Show Your Favourite Movies
Starts At Noon Ends Around 6:00pm
Stop By, Meet Some Friends and Grab a Bite To Eat.

This is an
All Ages/Faculty Event

MATH ORIENTATION '89
"The Week in Review"

Day	Event	Place & Time	Comment
Tuesday Sept. 5	Drop-In Centre	MC 3rd Floor 9:00am - 3:30pm	Come and meet your Big Brother and Sister and pick up your FROSH Package.
	Fed Pep Rally & Playfair	PAC 12:30pm - 2:30pm	Meet under the Pink Tie and the Mathies will Stampede over together!
	Off-Campus Event (Roadtrip!)	Bingeman Park 3:30pm - 1:00am	A day of fun in the sun followed by a Huge Dance (co-event with Env. Studies).
Wednesday Sept. 6	Drop-In Centre	MC 3rd Floor 9:00am - 4:30pm	Big Brothers and Sisters can answer your questions.
	Breakfast with the Dean	Great Hall, DC 10:00am - 11:00am	Share juice, coffee, donuts and croissants with the Dean.
	Frosh Orientation Program (Sponsored by the Faculty)	11:00am - 4:45pm	Bring your questions for Math Faculty Profs to answer.
	Meet-Your-Prof BBQ	5:00pm - 6:30pm Columbia Lake	Meet your profs informally as they slave over hot coals to cook your dinner.
	ELPE	PAC 7:00pm - 8:00pm	Some of us can't miss this one!
	"Jungle Madness"	8:00pm - 1:00am South Campus Hall	Safari Theme Pub! Wear Funny Clothes!
Thursday Sept. 7	Drop-In Centre	MC 3rd Floor 10:00am - Noon	The Continuing Saga...
	University Registration	PAC 9:00am - Noon	Line up early Be Sure to finish by Noon.
	Magical Mystery Tour	? Noon - 5:00pm	Buses will be taking you on a secret trip! First buses leave at noon.
	Scavenger Hunt	MC 3rd Floor 7:00pm - 7:00am	Form a team and... go on the HUNT!!!
Friday Sept. 8	Drop-In Centre	MC 3rd Floor 10:00am - Noon	The Final Episode.
	Volleyball/Baseball Tourney	Columbia Field Noon - 4:00pm	Two great games to choose from. Bring your glove.
	Casino Night	Fed Hall 8:00pm - 1:00am	Come early (8:00pm) and bring your tickets. Partial proceeds to Shinerama.
Saturday Sept. 9	Shinerama	About Town 9:00am - 1:30pm	All faculties washing cars for charity. Beat Laurier at its own game!
	Elora	1:30pm - 4:30pm	Spend a Day at The Beach!
	Family Night-Out	??? 8:00pm-?	Do what you want--It's decided by you! Meet up with other families.
Sunday Sept. 10	Movies	Fed Hall Noon-6:00pm	Come see your favourite movies!
	Sleep	?	Thanks for a great week..See you Monday!