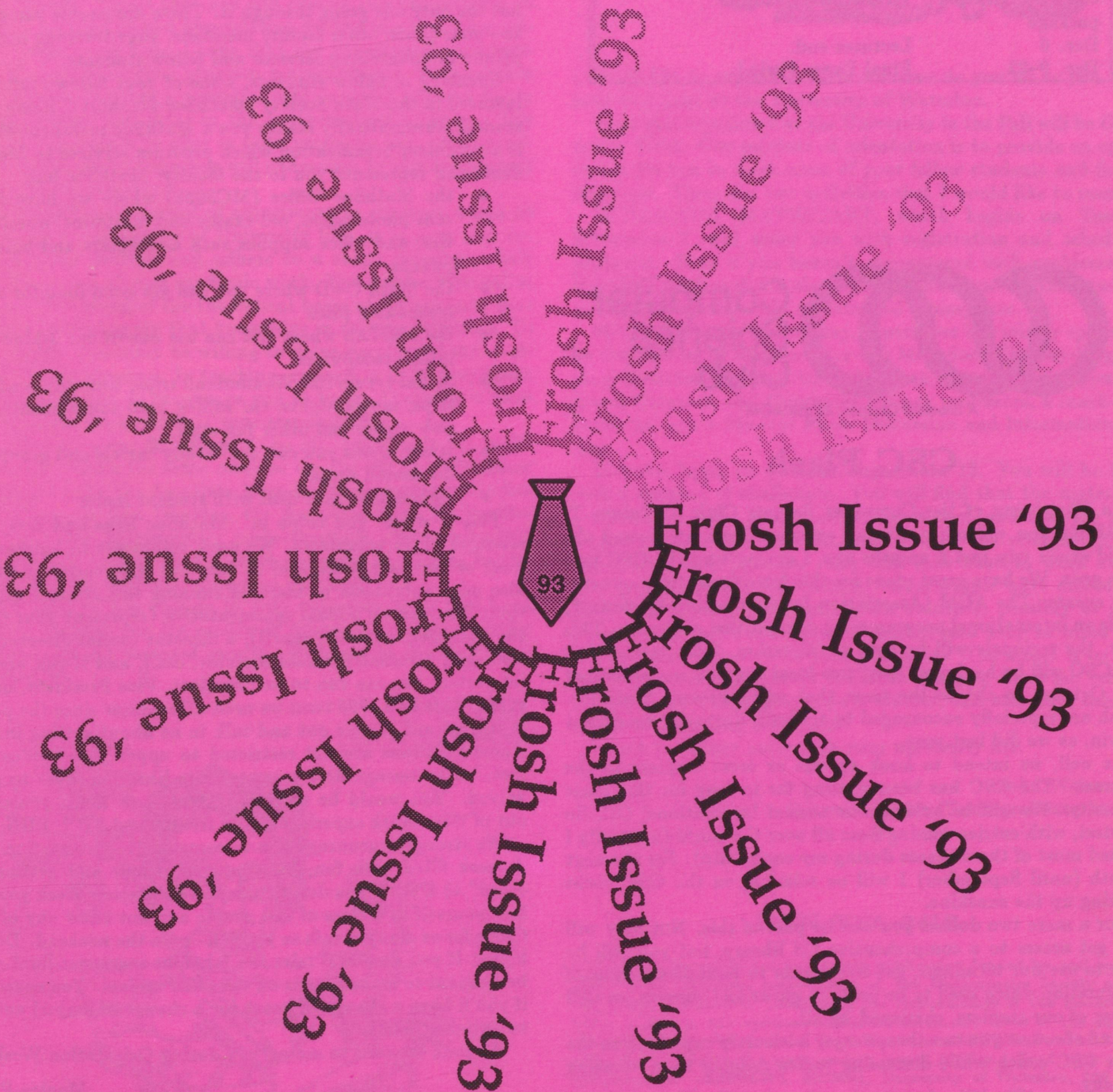


*math*

# NEWS

Volume 63

Issue 0





## lookAHEAD

## Important Dates for Fall 93

Date	Details
Sept. 6-12	Orientation and Registration
Sept. 7-24	OPERATION MATHSTART (MC 5158)
Sept. 8	Faculty Orientation Meeting
Sept. 8 (4 p.m.)	ELPE in the PAC
Sept. 13	Beginning of Lectures
Sept. 24	End of ADD a course period.
Oct. 8	Deadline for dropping a course. Deadline for Advanced-Honours transfers.
Nov. 3-5	Pre-registration for Spring Term.
check registration package	Withdrawal deadline
Dec. 6	Lectures end.
Dec. 9-22	Final Exam Period.



Computer  
Science  
Club

A Student Chapter of the ACM

## CSC Flash

As Chairbeing of the Computer Science Club, I, Calum T. Dalek bid you welcome. Having returned from an around the world canoe trip just 6 months ago, I am putting the CSC into high gear. We have great plans for this term apart from our regular events. The ACM (Association for Computing Machinery) holds an international programming competition each year. This year, the regionals will be held at Waterloo. This means that the CSC will be having at least two local contests in September and October to choose the team that will represent Waterloo. Frosh are especially encouraged to try out! Naturally we expect to win, as we did last year.

As well, we intend to hook up one or more staplers to the Internet. The CSC has been waiting far too long for this basic necessity. We will be holding our annual International Othello Contest, with entries coming from all over the world (naturally I visited most of these places during my canoe trip). For the next month (until September) I will be relaxing on the CSC yacht soaking up the sunshine.

For a mere two dollars you can be part of this. Not only will you get access to a comprehensive CS library, but you will be able to use our terminals, get free access to boundless reams of information which used to be privy to gurus and wizards, as well as use of our staplers, cherished by all.

And of course you can always enjoy a leisurely cup of tea on the huge CSC couch while discussing topics ranging from amazing to zany.

Calum T. Dalek

## Prez Sez

## Spring 1993 Exec

Monica Rooney  
Marco Koechli  
Jeff Stammer

President  
Vice President  
Treasurer

## Fall 1993 Exec

Elaine Ooi  
Kathi Lai  
< vacant >

Congratulations! Welcome to Canada's best university (see MacLean's poll, Fall 1992). You are now part of the only faculty of math in North America.

Be prepared for a big change in your life. Unless you are living at home, you'll have to learn to fend for yourself. University is very different from high school - I'm sure you have noticed already. You will have more people in your classes, a heavier workload, more responsibilities, different social life, new friends and the list goes on. The good thing about this is that you are not the only one going through it. There are people you can talk to - your profs, other faculty members, your teaching assistants, people at counselling services and fellow students.

Speaking of fellow students, some of your fellow students are involved in the Math Society (MathSoc for short). Being a math student automatically makes you a MathSoc member. MathSoc is a volunteer organization which provides services to Math students and represents you to the faculty. MathSoc has:

- the MathSoc Office (MC3038) where we have 5 cent photocopies, old exams and midterms, novels, and office supplies such as staplers and hole punches
- the Math C+D where you can get good food for a reasonable price
- the MacLab where you can use one of our 3 Macintosh computers
- Social events like Wonderland trips, Blue Jay road trips, movie nights, car rallies, card tournaments, pub nights and other fun stuff
- study rooms you can use - study carrels and group discussion areas
- committees that deal with student issues

This is where you come in. MathSoc lives and dies on the strength of its volunteers. We need volunteers to hold an office hour or two each week and to help out with social events. We also need volunteers to assist in running this student organization. You can be a class representative (represent your class to the MathSoc student council), a director (social director, office manager, internal/external director, etc.), and if you are really interested, you can run to be President, Vice President, or Treasurer. This Fall 1993 term we need a Treasurer since the position is still vacant. Come out and talk to us about getting involved. These positions are not restricted to upper year students - in fact, we encourage first year students like yourselves to get involved. You would be surprised about how much you can get out of this - work experience, new friends and FUN, FUN, FUN.

We strongly encourage you to come out to Orientation Week. A week filled with fun, meeting new people and getting "oriented" to UW. If you don't come to Orientation Week you could find yourself in a class of 150 people and not know any of them! Come for as many events as you can - even the weekend. Don't go home! If you do you'll miss the fabulous scavenger hunt. Don't be hesitant to make friends on the other stream. You never know if you'll have a change of heart (or a change of major) and have to switch streams.

We look forward to seeing you during Orientation Week.

Monica Rooney  
Elaine Ooi



## From The Faculty

I am pleased to have the opportunity to extend my greetings to the first-year class in this year's Orientation Issue of *mathNEWS*. I want to welcome you to the Faculty of Mathematics and wish you every success in your program of studies at the University of Waterloo. There is a tremendous variety of things to learn and do here, and many personal adventures await you as you initiate and progress through your undergraduate career.

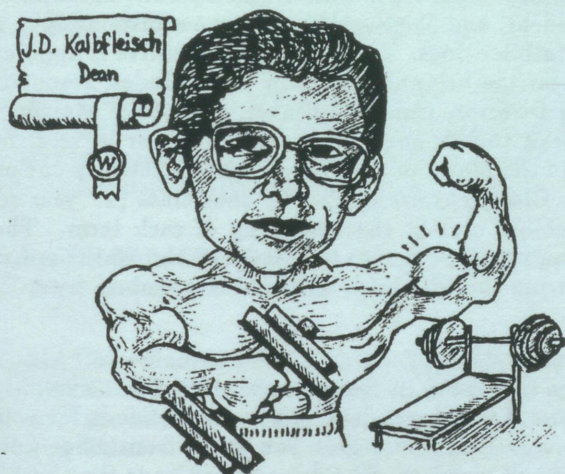
I am sure that one of the advantages that attracted you to the Faculty of Mathematics is the wide range of mathematical and computer-related courses available to you during your undergraduate program. Over the next four years, you have a wonderful opportunity to learn about many areas of the mathematical sciences as well as about disciplines in other Faculties across campus. I hope that you will exploit this opportunity to gain a broad base in and appreciation for the mathematical sciences. At the same time, I hope that you will expand your horizons and include in your program several courses from another area. This can provide a potential field to which you can apply your knowledge and skills in the mathematical sciences. The University has much to offer in both academic and extracurricular activities and I hope you will endeavour to involve yourself in the larger community.

There is always a period of adjustment as students adapt to the greater independence of University life. It is now your responsibility to develop and adhere to a study schedule which keeps you on top of your academic work. You will be required to develop a firm grasp of the theoretical bases of the subjects that you study and to apply that knowledge in solving problems. To be successful, you must be willing to delve deeply and strive always for understanding. In teaching, our aim is to help to direct your enquiries and to encourage you to learn. Learning is hard but rewarding work and it is your responsibility.

My office is on the fifth floor of the MC building in the south west corner. Along the same corridor are the offices of Professor John Wainwright, the Associate Dean for Undergraduate Studies and of Professor Ron Dunkley, the Associate Dean for Faculty Programs. The Mathematics Undergraduate Office is nearby. We are here to help so that if there are areas of concern to you as Math Faculty students, please let us know.

I wish each of you success in your academic work and hope that your time at the University of Waterloo will be a period of intellectual and personal growth. Welcome to the Faculty of Mathematics.

J.D. Kalbfleisch  
Dean of Mathematics



I would like to extend a warm welcome to you all as you begin your first year at the University of Waterloo.

Your first experience at the University in the Fall will be Orientation Week. One purpose of orientation is to provide an opportunity for you to meet some of your fellow students and faculty members. There are two activities that I would like to mention.

OPERATION MATHSTART, which begins on Tuesday, September 7, will assist you with registration and scheduling problems. 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, on Wednesday, September 8 is jointly sponsored by the Faculty of Mathematics and MathSoc. The day-long program includes breakfast with the Dean, meetings with your Algebra, Calculus, and Computer Science professors, a lunch-time barbecue, and a Student Panel Discussion and Information Session.

Lectures begin on Monday, September 13. You will be faced with a number of challenges. You will find that the material is covered at a faster pace than in high school, and that the problems require careful thought, rather than the straight-forward application of a formula. You will thus have to work harder than you have ever done before. Most people have difficulties. Discuss problems with your fellow students, possibly at regular meetings, visit the Tutorial Centre, and keep in mind that you can also consult with your professors. The secret is to start working as soon as lectures begin, so that you don't fall behind. Then you will do justice to your studies, and still have time for social and sporting activities.

I wish you every success in your university life.

John Wainwright  
Associate Dean, Undergraduate Studies

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Editor: Michel Goudeseune



## mathNEWS

What is it?

mathNEWS is your newspaper! mathNEWS, funded by MathSoc, has a mandate to entertain and inform UW 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 quite excellent -Ed). So come out some Monday or Wednesday 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, proofread them, format them, and eat the pizza we order every writers' night and production night. If you've never worked on a newspaper before, don't worry! We'll teach you how to use UNIX, L<sup>A</sup>T<sub>E</sub>X, PostScript, and online layout, as well as how to eat pizza.

Watch for posters advertising our organizational meeting during frosh week. We'll be choosing an editor(s) 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, or in the mathNEWS BLACK BOX. Come on out and be a part of mathNEWS!

## My Life as a mathNEWS writer

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 mathNEWS writers' 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 Wednesday 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 typeset these articles. There are lots of things you can do."

I looked at him and suddenly realised that mathNEWS 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 or Wednesday night. It was a great feeling, knowing that the following Friday the whole Math faculty would be reading mathNEWS (during their 8:30 classes, 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 now a purpose! This can happen to you, too, so remember: Come out to a mathNEWS night!

## 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 \$7.50 fee to provide all kinds of services and events for its members.

Where can I find MathSoc?

The MathSoc office is located in MC 3038. This 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?

Free services provided by MathSoc to its members include: a telephone, change (\$\$), lost and found, a mail drop, copies of old exams, five cent photocopies, lockers and use of the Macintosh computer equipment. Across the lobby is the Comfy Lounge and the C+D where you can get food and drink at very reasonable prices. MathSoc runs an individual quiet study room and a group study room on the fourth floor. MathSoc also sells buttons, recycle mugs, pencils, and shirts for a low price.

In addition to these services, MathSoc also organises social events. 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?

As you might guess, lots of people are needed to staff the office and help out with social events. These people, all volunteers, 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 someone's question. It's a great way to start to getting involved with the Society. Just sign up for an hour on the MathSoc office door and show up for that hour.

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 the ones ultimately in charge of what MathSoc does. The appointed executive is appointed by Council near the beginning of term and includes, among others, the Social Director, Council Speaker, and Office Manager. You should speak to a member of the executive or leave a message for them in the MathSoc office if you're interested in one of these positions. Class reps are elected by each class (1<sup>st</sup> year regular, 3<sup>rd</sup> year co-op, etc) at the beginning of each term. The next election (and your chance to be elected to the MathSoc Council) will be during the first three weeks in September.

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' UW.



## 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 dark green. You noticed that it had your name printed on it. Then you noticed the line that said "Balance due Sep 10" and the number beside it: \$1513.28 (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 \$340 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 fee. This fee is paid 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.

**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, Fed. Buses to Toronto and more.

**Federation Hall:** This fee goes toward paying off the student pub located on campus near Village 1.

**Student Co-ordinated Plan:** A large endowment fund has been created for use by the students for the improvement of student life. There are lots of exciting new plans that have been made possible by this fee.

#### *Fees That You Can Get Back Later*

The 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, which are run by and for students. They would love to have you join them and help them out.

**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 94.5 FM (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.

**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 1993		
Fee	Amount	Notes
Must Pay these ...		
Tuition	\$1013.00	everyone pays
Co-op Fee	340.00	co-ops only pay
Work Rpt Marking	14.00	co-ops only pay
Health Insurance	28.73	regular students
	53.50	co-op students
Athletic Fee	31.75	school teams
Fed. of students	24.65	
Federation Hall	7.50	
Student Plan	10.00	
Refundable fees		
Waterloo P.I.R.G.	\$3.28	
Radio Waterloo	4.00	
Math Society	7.50	a good deal
Imprint	4.10	

## profQUOTES

It was only eight years ago that the first profQUOTES were submitted, but they're arguably the most popular feature in mathNEWS. 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 mathNEWS. All profQUOTES are submitted by students (don't forget to submit yours!).

Watch for profQUOTES in this, and every other, issue of mathNEWS!



## Math Faculty Programs

### Accounting

The president of a large corporation was interviewing three candidates, an engineer, a lawyer, and an accountant for a vice-presidency in the corporation. The president called in the engineer and asked him: "What is  $2+2$ ?" The engineer replied "4" and the president dismissed him. Next the lawyer entered, and was asked the same question. He also replied "4" and was dismissed. Finally, the accountant was called in. When asked the same question, he replied: "Whatever you want it to be." He got the job.

The accountant has traditionally been viewed as a dull, humourless pennypincher with the social graces of a computer. This may have been true some time ago, but no longer. Now, accounting is a high profile, high demand, high paying profession which opens up avenues to a multitude of careers, only a few of which are actually in the accounting field.

The first choice you must make once you have entered the MATH/CA program is between the financial (CA) and managerial (MA) branches. Although there is very little difference in the courses you choose (Only one in four years), the major difference arises in the types of jobs you will do, and upon graduating, the exams you will write.

Financial accountants are responsible for "providing an independent assessment of the statements in terms of their fairness and conformity with generally accepted accounting principles" (the dreaded GAAP word), and management accounting assists in "planning, controlling and evaluating within an organization."

There is the Accounting Students Association (ASA) formed by both the Math and Arts programs. The ASA holds many social events, sponsors sports teams and brings in people from the accounting field.

The MATH/CA program is not an easy program. You need good marks to get in and to stay in. But, if you want to write your own ticket once you graduate, this is the way to do it.

### 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.

### 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 actuaries, 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 UW. But it is interesting and somewhat practical. Give it a try, you'll be glad you did when you graduate.

### Business Option

The Business Administration option offers the following courses during your four years at University: Financial/Management Accounting, Introductory Business, Marketing, Micro/Macro Economics, Business Law, Managerial Finance, Managerial Science, Personnel Management, and Business Policy. The Business option is an excellent education to gain because it opens a lot of doors for interesting and challenging jobs upon graduation in a business world which is growing and has need for mathematically inclined business graduates.

In first year, you will be required to take BUS 111/121 and ACC 121/122. You can also, in first year, take other Business courses mentioned in the Undergraduate course calendar. BUS 111/121 are introductory business courses which are taken at Wilfred Laurier University and ACC 121/122 are Financial Accounting and Managerial Accounting.

All BUS courses will be taken at Wilfred Laurier University. The grey building called the Peters Building on the corner of University Avenue and Albert Street is where all the Laurier Business courses are taught. Non business students are always asking me how I can handle the long trek to Laurier all the time. First of all you get used to travelling to Laurier all the time for your classes. Secondly it really isn't that far. In your first month or so, the distance between Laurier and U of W will shorten up. The Peters building is probably the closest building on the Laurier campus to the U of W campus. In some cases you will have only ten minutes to get from U of W to Laurier or vice versa, but this amount of time should be adequate if you don't dilly dally. Most people walk but Laurier is equipped with bike racks and parking lots if you choose other methods.

So, if you are looking for a program that is both challenging and extremely interesting, then choose the Business option.



continued from page 6

## Combinatorics and Optimization

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.

Optimization 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.

## Computer Science

(See the article called *CS or Not CS* on page 10)

## Inter-Departmental Math

Okay, it's a question that everyone asks. What is a Non-Specialist? Well, it's not someone who can't do anything in Math; rather, it's someone who does many things in Math. In other words, a jack of all trades, and a master of many. Why would anyone want to be a Non-Specialist? Well, not many people want to be a Non-Specialist but they become one by default. No other major interests them, so they don't major in anything. Others just can't decide which area of Math they like best so the Non-Specialist program allows them to sample from every program. Or there's also the person who is in between majors and manages to find a home in the Non-Specialist program temporarily. Doesn't it sound like fun?

The NS program is probably more difficult than even the CS major program as there is such a wide variety of topics that are covered. Not only do you have to know how to program in Assembler (CS 230), but you also have to know how to solve first order differential equations (AM 250). Of course, there's everyone's favorite—C&O 230. And there's exposure to many of the higher maths, including Geometry, Real Analysis, Complex Analysis, or, if you're a true glutton for punishment, there's always Calculus 4.

A great advantage to the NS program is that you have the freedom to minor in another faculty while you're at it. Perhaps you have a penchant for Philosophy, or Psychology, or perhaps Russian. You have the freedom of picking whatever electives sound interesting. But, remember, once in NS, you can't have a Minor or Joint Honours program within the Faculty of Math, but any other faculty on campus is okey-dokey.

Convinced yet to become a Non-Specialist? No? Well, let's see... what else would make you want to be a NS? My favorite reason is so that I can gleefully taunt those CS majors who are sweating over a 60 hour CS assignment. Probably the biggest reason to become a Non-Specialist is that you get a wide variety of Maths and the opportunity to become friends with everyone from every other major. So remember, Non-Specialist is the place to be!

## 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.

continued on page 8



continued from page 7

## Statistics

By the time they graduate from high school, 99.9% of all Canadians have seen enough uninteresting and useless statistics to be skeptical of any politician that trots out a few numbers to bolster her/his argument. This is a good thing. Healthy skepticism is a fundamental attribute of a professional statistician (unlike say your favourite sportscaster who after examining the entrails of countless tabulations merrily predicts all sorts of things). Statistics is that branch of the mathematical sciences which focuses on the development and correct application of the scientific method. The statistician is concerned with answering questions such as: what data need to be collected; how should they be collected to provide efficient, reliable answers to the questions of interest; how can a mathematical model which describes the process that generated the data be described, and verified; how can the data be summarized and presented clearly; what conclusions can be drawn from the data and what is the degree of (un)certainty of these conclusions; what actions should be taken and what are the predicted consequences of these actions; do the data provoke questions which might be addressed by a future study?

The range of applications is enormous: from the predictions of the onset of AIDS for a given individual to determining of the best marketing strategy for a given product; from the reconstruction and recognition of images produced by computer-aided tomography to the improvement of product quality in a manufacturing process. Statisticians are called upon to participate in research areas from anthropology to zoology.

Statisticians need a strong mathematical background, especially in probability theory, and use a variety of mathematical and probabilistic models in their problem solving. Essential to this problem solving is the computer: to perform the sometimes complex calculations necessary; to access and deal with large data bases; to graphically display complex aspects of the data and the mathematical models in a simple informative manner; and to provide a laboratory for simulating random phenomena that are too complex to deal with analytically.

Your training in Statistics at UW can provide you with the necessary tools to attack a wide range of mathematically and practically significant problems. For a start you would question the validity of the first statement in this description.

## Financial Assistance

University is a very expensive habit (\$1513 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, there are sources of income most students can apply for.

The Ontario Student Assistance Program, better known as OSAP, is the largest. Get the proper forms from the Registrar's Office, fill them out, and send them in sometime in September. Although they may tell you the deadline is passed, that just means you won't be getting any funding until near the end of the term (when you need it most). A new regulation has been passed that allows most students who apply to receive a loan, and grants will be given on a very limited basis. The loan is interest-free until you graduate. You can only apply for the first eight terms at school.

OSAP isn't the only source of money. There are numerous scholarships and bursaries available that are often forgotten. Check the Undergraduate Calendar to see if you qualify for any.

If OSAP and other student awards leave you wanting, there are many jobs available on- and off-campus. Beware: jobs cut into study and leisure time.

## On Failing

*It sometimes happens ...*

It's January, 1993. You pick up your first grade report to find that you received a 35% in one of your courses. You have now encountered something that you have probably never encountered before. You have failed a course. If you find yourself in this position, or find that you are failing a course in the middle of a term, remember one thing: It is not the end of the world. Believe me, I know; I failed a few courses myself.

If you do find you are failing a course mid-term, look for help. Help can be obtained from your friends in the course, the professor, and the course's Teaching Assistants. If it is a math course, the Tutorial Centre (MC 3004) is also there to help you when you are in need. As a last resource, if you feel you cannot recover at all, look into withdrawing from the course. You can do this through the nice people in the Math Undergrad Office (MC 5115) before the end of the 10th week of term. This may allow you to dedicate yourself to your other subjects without being distracted.

If you have failed a course, especially if it is a math course, or a course required for your degree, I would suggest that you seek out your undergraduate advisor. If you don't know who that is, ask the Undergraduate Office (they know everything). When you see your advisor, just explain your situation and your advisor should be able to help you understand the implications of the failed course.

First year is a *very* traumatic time for some people. There are already enough new and confusing things in your life without having to worry about these things called classes. The University of Waterloo has been around for over 30 years, and the administration here has seen lots of people fail courses and still graduate. Failing a course will let you know something about yourself that will help you deal with your problems in the future. Look at it as another learning experience (groan).

I am not saying that failing a course is a good thing, and most of you won't fail any courses, but just remember that if you find yourself in trouble: seek some help and either get out of that trouble or find out where you stand. You may panic over nothing and get yourself in bigger trouble.

Good Luck in September.

## 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.



## Can I Appeal My Grades?

*Or: What Happens If I Do Fail?*

Now that you've read *Dropping Out* and *On Failing* (and if you haven't, then go back and read 'em!), what happens if you do actually fail a course here? Well, you're not in high school anymore (how many times have you heard that?), and failing a course at university happens to the best of us. It's not really a big deal, at least, it's nothing to get all bent out of shape about.

**BUT**...sometimes people fail courses unnecessarily. What do I mean? Well, for example, in my 1A term I took MATH 130A (that's what 1A Calculus was called back in the Stone Age; you call it MATH 137/147). I was smoking the course — my assignments were good, I aced the midterm — basically, I was doing pretty damn good in the course. Then after I took the final exam, they mailed me my marks. When I saw my Calculus mark, my jaw hit the floor in shock. I was expecting a mark in the 80's, and I got one in the low 50's. The only way that could've happened would have been to fail the final. I was currently on work term, so I let that mark go as a badly written exam.

What I didn't know at the time, is that you are actually allowed to *Appeal* a course mark. By the time I found this tidbit out, the time limit to do so had expired already. Duh. So here I am telling you this fact before you too have to learn the hard way. If you "know" you should have gotten a better mark than you did, *don't* take the prof's word for it. Appeal it (or at least ask to see the exam). Anyone can look at their exams. It's free, too. If, after you've seen the exam, you believe you got ripped off (a question was marked wrong or added incorrectly, course mark calculated incorrectly, etc), then you can formally Appeal the mark you were given for a nominal fee (I believe it's now \$5 for each grade Appealed, but you may want to verify this when you get on campus).

When you Appeal a mark, you force the prof to re-mark your exam (if that's what you want him to do), or recalculate your mark (if that's what you want him to do), etc. And, get this, if you think your prof has it in for you (ie. gave you a bad mark because he/she hates your guts), you can ask another prof to mark it for you instead! But be warned: your grade could drop!

But in order to take advantage of Appeals, you must Appeal a mark less than 6 months after completing the course (ie. if you're in Co-op, that gives you until the middle of your *next* academic term). How do you Appeal a mark? Just truck on up to the Math Undergrad Office (MC 5115), and tell the friendly people behind the desk that you want to (a) see your final, or (b) Appeal your mark. Is it just that simple? YES! It is just...that...simple (See: Undergrad Calendar, page 13:22; Grade Appeals).

And something new is starting this year. The Math Faculty is implementing a system by which you are allowed to Withdraw from a course. If you read the Undergrad Calendar (page 13:21, Course Drop Policy), you will know that you may Drop a course within the first 4 weeks of lectures without academic penalty; it will be as if you never signed up for the course in the first place. However, if you miss the 4th week deadline, you may not Drop the course any longer, BUT you are allowed to *Withdraw* from the course before the 10th week. A Withdraw is different from a Drop in that (a) the Withdrawn course remains on your transcript and assigned a grade of WD, and (b) the Withdrawn course counts as a course attempt. Both a Withdraw and Drop, however, are not counted in your average or your count of credits/failures.

The only catch to using a Withdraw? You may only use them between the 4th and 10th week of lectures, and you may only Withdraw from at most *ONE* course per term for each of the first three terms of full-time university registration.

The info I've given you can be found in the Undergrad Calendar (hmmmm, I've told you that for the 3rd time already, maybe it's important). Look at pages 13:21 to 13:24 in particular. Not only do they explain what I've told you here, but it explains about other Faculty Policies (Academic Standing, Co-op Regulations, Standings and Promotions Committee, Petitions, etc). Read it. Be informed. Don't get caught with your pants down like I did. An ounce of ignorance can equal a ton of headache in the university game. Make sure you don't need the Excedrin.

Curtis "Chewbacca" Desjardins

## Dropping Out

*Trials and tribulations of a former mathie*

This is a serious article. I don't take my education lightly any more.

In Fall '91 I started at UW in co-op honours math. I assumed that I would do fairly well, and basically cruise through university to my degree. Well, I will eventually get there, but not without some major hurdles.

Distractions can be fatal to a first-year student. I knew in 1A that my marks weren't going to be anything spectacular, but nothing could have prepared me for the marks report I got in January. Out of 5.5 courses, I failed 5. Not exactly a good position to be in, but with perseverance, it would have been possible to pull through until fourth year without dropping out.

Coming back in Spring '91 from my work term, I was determined to do better. So, I resolved to actually do my assignments, and keep working throughout the term. Yeah, right. Summer? Distractions galore, and I wasn't able to apply myself enough to my studies. I failed another 2 courses that term, bringing the total in 2 consecutive terms to 7. If you fail 6 in two consecutive terms, it's up to the faculty. In my case, I was 'required to withdraw.' (Note that the regulations have since changed.)

I looked into transferring into another faculty, but due to the recession and such, all faculties were full. Not even Arts would look at me. I took the requisite 2 terms off school, did the 3 pre-university math correspondence courses on my own, and re-applied to Math. Remember that this is still an administration. In spite of reasonable marks in the 3 courses, I was twice denied readmission to Math, and also turned down twice for a transfer to arts.

I have since completed first year at a Community College in CS. I came out with an A+ average. However, the faculty seems to think that two chances are sufficient. Mine were 1B and the pre-university courses. Now, nothing I say will convince the administration to give me a probationary term here.

I've learned my lesson the hard way. Hopefully, someone reading this will learn from my mistakes. You can continue making excuses to yourself until you're blue in the face, but you have to answer up to yourself. I did, and I'm no longer at UW. Nor will I ever be. I have been accepted to another university more willing to take a chance on me, and I will have my degree in 4 years.

Based on my results, if you drop out, you won't be back.

Michel Goudeseune

"If you don't do this, you're — what is the word when you do badly — you're toast."

J. MacKay



## 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. 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 by their second year. 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 programs 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 programs 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 program, exposure to the wide range of mathematical fields available.

By third year, most programs 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 an 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

"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

"What we usually do is write this as  $4 = \frac{1}{2}$  so that the freshmen coming in next class will drop out."

K. Rowe

"Set X is women. Set Y is men. The problem is to match men to women in order to make the women happy. The men don't have a say in it. This is called the Marriage Problem."

A. Bondi

- Social events
- Coffee & Donut Shop
- Study rooms
- Photocopiers
- 'Mathwear'
- mathNEWS
- Orientation

## CHECK US OUT!

Located on the third floor of the Math Building  
MC3038 Phone: 885-1211 x2324



# 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 Fed Hall, 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. A great place to get lunch when you still have money. 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. Going into a major overhaul over the next year, and will be the "Hub" of the campus.

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

**CSC:** Computer Science Club. MC 3036/3037. Lively social atmosphere, large library, couches, members that can answer your questions about *anything*, and powerful staplers.

**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. And don't forget about the magic mushrooms popping up everywhere.

**Endless Loop:** See Loop, Endless.

**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:** The biggest student pub in the Commonwealth. Serves lunch during the day, and parties at night. Worth getting out to see. It's noisy, but you'll love it. It's open to all UW students, regardless of age.

**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:** 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.

**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).

## Phone Numbers You May Need

To call a University extension, dial 885-1211 (during business hours) or 888-4434 (any time), and ask to be transferred to the extension you want.

Emergency	911
University Switchboard	885-1211
University Security	ext 4911
Health and Safety	ext 3541
MathSoc	ext 2324
	888-4779
Computer Science Club	ext 3870
Counselling Services	ext 2655
Co-op Co-ordination	ext 4026
Turnkey Desk	888-4434
Kitchener Transit	741-2525
Gray Coach	741-2600
VIA Rail	(800) 268-9520

"Matrix comes from the Latin word meaning 'mother', so when I point to a matrix and say 'This mother!' you'll know what I'm talking about."

L. Dickey



## Extra-Curricular Organizations

### 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!!



Computer  
Science  
Club

A Student Chapter of the ACM

Greetings frosh! Welcome to Waterloo and by deduction, the Computer Science Club.

Membership in our illustrious club is open to everyone, no matter what major /department/faculty. All we ask from you is a mere two dollars, in return for which we grant you all sorts of privileges. We support CS wizard talks, maintain a comprehensive library of CS books and computer manuals ranging from 6502 assembly to fractal programming. We provide tea and doughnaughts as well as a cozy atmosphere in which to hang around, and discuss topics of interest ranging from the Art of War to the ever popular Unix Q&A. We have terminals available for use to all members, and we are the only computer room where food and drink is not only permitted but encouraged. Finally we provide the only reliable stapling service. Our heavy duty power staplers can staple most of your 200 page CS assignments with no problems.

Our office (MC 3036/3037) is located right across the hall from MathSoc, and we know from past experience, many of you will find us in your search for MathSoc. The third floor isn't completely confusing, just mostly confusing. Anyway c'mon out. We're one of the largest clubs on campus and growing all the time.

The CSC welcomes you to Waterloo. We're a club for everyone who is interested in any way in computers. Memberships are affordable even by university student standards, and we provide members with up-to-date information on computers, languages and computer related phenomena, as well as intelligent conversation on most topics. Aside from that, we assist (offer consulting to) all members and non members alike. And we invite interesting people to speak at our meetings, which are open to all. Drop by our office MC 3036/3037 any time, have a cup of tea and become a member!

"You know I've been taking antihistamines and wheeee! you're way out there!"

Hultin

### Actuarial Science Club

Heading into its third year of operations, the Actuarial Science Club is the most happening club on campus. For a mere two dollars, members and others are informed about Actuarial Science. This is especially important for first year students who haven't yet decided on a major.

Various talks and conferences help to keep students abreast on developments in the "real world" and how they affect actuarial science.

Social events have played a large part in the operations of this club. Each term promises a huge bash (open to everyone) following either the writing of the professional exams or upon receiving results.

And last but not least, the Act Sci Club is affiliated with The Actuarial Science National Association. ASNA holds an annual conference and publishes a magazine.

The Act Sci Club office is located in MC3030. Feel free to drop in any time. There's plenty of fun for everyone so be sure to come out and get involved.

### PMC&O Club

Hi. We're the Pure Math/Combinatorics and Optimization Club - PMC&OC for short (which would YOU rather say 25 times fast? (or slow for that matter?)). We all hang out in MC 3033, just across the hall from the Mac Lab (where you'll be having 1st year CS labs).

What IS Pure Math, you ask? What ARE Combinatorics and Optimization, you ask? Two very astute questions that won't be answered here. Why not drop by and find out? Talking to someone in upper-year Pure Math and/or C&O will give you a much better picture of what's going on than some short article will.

Not that you have to be in either Pure Math or C&O to join - any and all are heartily welcomed and encouraged to join. But what do we do? Another very perceptive question - and one that will be answered here.

Weekly talks are held on a wide variety of subjects, given by either professors or students, and expose students to areas of mathematics you probably won't see in class! The talks are really cool, and we serve refreshments!

Also, the PMC&OC office (MC 3033) is usually open during the day and staffed by an office worker or two to provide assistance with your problems and advice on a wide variety of subjects (not all academic). It's a cool place to hang out, too!

We're not just an academic club by any means ... usually, in any given term we've got all kinds of sports teams, a movie night/weekend, BBQs, and even a Pure Math Pub or two ... And that's not to mention the BIG END OF TERM BASH!!!!

However, none of this can happen without either members or volunteers! (either to run for office and be the club's executive, or just to help us keep organized throughout the term). If any of this sounds remotely interesting (and I presume the "we serve refreshments" part did, at least), either drop on by the office, give us a call (x6139), e-mail us (pmclub@watserv1) or simply watch for posters announcing our organizational meeting to be held (probably) during the second week of the term!

continued on page 15

"How many people go around memorizing the negative binomial distribution?...then you're a nerd. Get a life!"

C. Cutler



continued from page 12

## 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 and help write the script.

The script has been in the works for five months. Writers' meetings will be approximately twice a week. The call for cast and crew is in the first week of January. The show runs for four nights (five shows) early February to an audience of hundreds.

Watch for posters announcing FASS meetings early in the term. Check the Imprint, Gazette, and mathNEWS Calendars of Events for more details.

## Other Things

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, Bridge, 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 arrive. Get involved! University isn't only about learning, it's about making friends.

## Did You Know...

(From the UW 93-94 Undergrad Calendar)

1. ...the Imprint "is dedicated to the intellectual analysis and coverage of the news, arts, sports 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 13 miscellaneous policies. This is more than any other faculty; actually about 13 more.
7. ...if you open the calendar exactly in the middle you can read all about your favourite faculty. No, not Science.

## Advanced Insanity?

"To be Honours, or to be Advanced, that is the question." This thought 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 levels of honours Math courses. Most math students choose to take MATH 135/136 and MATH 137/138. 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 may not be limited to that material. These advanced courses are more theoretically oriented than the regular honours courses. Don't forget though that MATH 135/136 and 137/138 are challenging enough for most people—they aren't called Honours for nothing.

The advantage of taking the advanced courses is smaller classes (30-40), which allows friendships to develop more easily and gives a more personal rapport with the professor. The homework will challenge you as much as you want or can handle, and is less mechanical in nature. The courses offer understanding of the "why" of concepts behind a problem, and not merely the "how to" knowledge to solve a problem. 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. Further, if you intend to major in Pure Math, you will have a very noticeable advantage in third and fourth year if you take Advanced Honours in first and second year. The theoretical background will prove invaluable.

Now, the disadvantages. There is some tendency to lose contact with the rest of the first year students because of the separation of the courses. Furthermore, advanced classes can at first seem more competitive. Because the assignments are not mechanical, students must provide some of their own practice problems, or face difficulties in later senior courses. Finally, there is no official recognition of the advanced honours graduate.

If you enjoy mathematics, such as that on the Descartes, and want a thorough understanding of some basic math concepts, then you should consider the advanced courses. The faculty has set it up so that it's relatively easy to switch from the Advanced courses to the regular Honours courses without doing any other damage to your timetable.

Most people in the regular Honours sections felt that their courses were enough work. They believed they would not have survived the advanced courses. Remember – the decision is yours and yours alone.

I stuck it out through three terms of advanced honours and I'm glad I did. The deeper understanding I gained helped me in later courses.

"This is one of those limits that says, 'Divide me in two and do me from both sides!'"

J. Wainwright

"When a child begins to form sentences, he sometimes gets the words wrong. For example, 'Me eat'. Now, occasionally he'll reverse the word order...I didn't mean to say that."

P. Eastman

"The midterm will cover chapters 1 through 7. For those of you in Arts, that's chapters 1, 2, 3, 4, 5, 6, and 7."

P. Eastman



## 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 mathNEWS 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 taken 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 120:** Introductory Chemistry. Seems to be a re-hash of OAC Chemistry, except at a more professional level. Nothing really new. You can take an optional quarter-credit lab with this course.

**CHEM 123:** More Introductory Chemistry. Follows from OAC concepts. Gets a bit nasty towards the end of the term, but it doesn't really hurt. You can take another optional quarter-credit lab with this course.

**CS 130:** A.K.A. Introductory Mouse Training. Train your Macintosh's mouse to program in Pascal. The course uses a case-study approach to show HOW to program, not only what words and symbols to string together in a program. Lectures use a "watch me do it" approach while tutorials are "you do it (with a bit of help)". Labs provide a guided setting to practise the concepts and prepare for the assignments. Reading before class is expected.

**CS 134:** Basically, this is a first course in computer science, to follow a course in computer programming (CS 130). Students who want to do this should have completed at least a year of solid study in a language like Pascal or C, and be familiar with procedures, functions, parameter passing mechanisms, and be ready for recursion. They should have the ability to convert an English description of a method to solve a problem into a working and properly structured computer program.

**CS 241:** This is the class to remove the mystery of computers. How does the CPU work? How does a compiler "understand" my Ada program and turn it into machine code? Tired of Pascal? Learn about Ada, Scheme (LISP) and Prolog.

**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, approximations and infinite series. 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).

**MTHL 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 quizzes 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.

**PHYS 121/122:** Similar to OAC Physics, you probably won't learn much new in the first term. Second term covers waves, gravitation and thermodynamics. Mathematical and a fair number of formulas.

**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.

## mastHEAD

Here are the people who helped out (with their year and major, high school and home-town) with making this thing. Recognize anyone?: Michael Melvin (2N General Math - why be specific?, Glencoe D.H.S., Glencoe, Ont.), Eric Sutherland (4N Statistics/C&O, Lorne Park S.S., Mississauga, Ont.), Curtis Desjardins ('92 C&O (Confusionatorics & Obliteration); '93 Psychology; what's next? (open for suggestions), the now-defunct Welland High & V.S., Welland, Ont.), Shannon Mann (3A Independent Studies, Norwell D.S.S., Palmerston, Ont.), Monica Rooney (3A C&O, St. Jean de Brebeuf, Hamilton, Ont.), "Phil" (2B CS, St. Paul's SS, Mississauga, Ont.), and Ian Goldberg (back from Editing in his ever-popular role of Head Productionist, 3N Double Pure Math + Computer Science, University of Toronto Schools, Thornhill, Ont.)

Thanks very much to Marion and Graphics Services.

Michel Goudeseune (3B !MATH,  
St. Michael's Choir School, Mississauga, Ont.)



## 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, if you are in co-op.

**Stream 4 vs Stream 8:** The first big question is just what are the two streams? No matter which stream you choose you will have to do eight straight months of school at some time. 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.

**COOP 000:** This next sentence will teach you everything you need to know about co-op. Attend your co-op orientation (COOP 000) sessions. These sessions are run by the Department of Co-operative Education. Various aspects of co-op will be discussed there each week, so it is very important to attend these sessions.

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 prepared your résumé. About 20 to 30 copies will do. If you want help with preparing yours, there are many people who are willing to help you out in Needles Hall, co-op central. Around this time, there will be a number of postings in Needles Hall, as well as the first floor of the Math Building with loads of jobs.

Some time after this, there will be interview postings which will have all the names of people who have interviews within the next couple of days. Don't worry if your name isn't there on the first day, there are plenty more days to come. Be sure to check everyday. Missing an interview is bad news.

Co-op is trying something new this fall called "Continuous Placement" which will (more or less) take some of the stress off during interviews. After you have been interviewed, the employer will contemplate his decision, and eventually he will inform Co-op of his choice. Meanwhile, the student will rank any interviews they have had within the last week (Monday to Rhursday) and placements should be available by the end of the day (Friday).

This plan is in the fledgling stage, and I would highly recommend that you attend the Co-op information sessions this fall to find out exactly what is going on. With this plan there should no longer be a "Second Rounds," although after a time a co-ordinator may schedule a meeting to change some students' résumés

**Problems:** 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 Students Advising Co-op rep. He or she should be able to solve your problem or tell you who to see.

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.

## Problem Solvers

*Where to go for help*

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 had the same questions answered for them, probably by their big brothers and sisters. They are willing to help you during and after orientation week. MathSoc is another place to go for help throughout the term. Although the friendly office worker may not know the answer, he or 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 7, MATHSTART should be a necessary stop for all students with problems that should be tackled right away. 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 MC 4002 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 or 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.

Any question or concern you have can be answered by using one of the services mentioned here, but only you can search them out.

## Writing the ELPE

The ELPE is the English Language Proficiency Exam. All first year math students who did not get at least 80% in OAC English must pass this exam once in their University career.

What do you have to do in it? Well, you have to write an essay which is based on a quote that you are given. The content of the essay is not important, the english, however, is. To put it bluntly, you have one hour to bullshit in the Queen's english. But, don't worry if you don't pass it the first time, you have at least eight chances to pass it over the course of your studies here.

If you would rather take an english course, a mark of C- in ENGL 109, 129R, 210C, 210E, or 210F will also give you the required credit.

Now, when you graduate, you will be able to leave here and say, "Four years ago, I couldn't spell 'mathematician'; now I am one."



## 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 everything 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 are about \$1300 a term. In addition, you have to buy a meal plan for \$995. If you buy the more expensive plan, you can get the extra back if you don't use it. The \$995 is the minimum you have to spend.

### Church Colleges

Waterloo has four affiliated or federated church colleges which run residences as well. St. Jerome's, sponsored by the Roman Catholic church, is the oldest of the four and has two separate residences: St. Jerome's, for men; and Notre Dame, for women. Renison College is the Anglican college on campus. St. Paul's College, sponsored by the United Church, has a large residence, and Conrad Grebel College, operated by the Mennonite Church, has a smaller residence. Residence fees for each of these run around \$2100 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 Inc. (WCRI) is built, owned, and operated by students. The Co-op is located within a few minutes walk to, but operates independently of, the University of Waterloo. WCRI offers housing services to all university students regardless of whether or not they are enrolled in a university co-op program; the word "Co-operative" here means that the residence is owned and controlled democratically by the members who live there.

WCRI has three newly renovated co-ed residence (dormitory-style) divisions: Dag Hammarskjöld, at 139 University Ave. W., housing 108 members, Phillip North and Phillip South, at 280 Phillip St., housing 144 students each in a combined total of 96 single rooms and 96 double rooms. Each residence has a dining room where lunch and supper are served daily. Each floor has a lounge and a kitchenette where members can make breakfast and have 24-hour snacking with food supplied by the Co-op.

The apartment divisions have a combined total of 16 one-bedroom, 48 two-bedroom, 58 three-bedroom and 35 four-bedroom apartments. Each apartment is equipped with a fridge and stove. Those who choose to live in an apartment and have not acquired culinary experience may purchase a meal plan package, which also includes a vegetarian option, that suits their needs.

Members have access to many services including inexpensive laundry facilities, parking, interior bike rooms, exterior bike racks, woodworking room, piano room, study carrels, recreational rooms, and our very own Weavers' Arms Pub, just to name a few.

WCRI's small community-like atmosphere encourages members to get together for many planned social, recreational, and sports events, movie nights, fitness classes, and excursions.

Each member is responsible for the cleanliness of his/her own room or apartment, shares responsibility of the cleanliness for the common areas and contributes towards the operation of the Co-op. By having members do work duties, expenses are reduced, resulting in lower fees. All members have the benefit of claiming their accommodation fees plus utilities for the Ontario Property Tax credit at income tax time, which adds up to more savings.

The necessity to work together helps create the sense of community which is an integral part of the Co-op experience and by stressing mutual responsibility, a satisfactory atmosphere for study is maintained.

For further information write to or call:  
Waterloo Co-operative Residence Inc.  
268 Phillip Street  
Waterloo, Ontario  
N2L 6G9  
(519) 884-3670

## 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: 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. In any case, the first person you will be dealing with is the landlord. Some are very understanding and can be obliging. Others can be downright difficult to please. 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 a lease, you may find it necessary to sign for a minimum of one year. You can usually sublet while you're working out of town.

Most places will require you to bring your own supply of sheets, blankets & pillows, possibly furniture and cooking utensils - some may come unfurnished. You should also bring a few of your Mom's 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 above 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. The price range fluctuates, but you can expect to pay between \$270 and \$450 a month for a livable (but not luxurious) place, depending also on furnishings and location. Utilities can be more than \$50 a month per person during winter terms, so don't forget to budget for them. Shop around before you take a place, but remember that good deals can be snapped up fast!



## Survival Kit

As you prepare to venture into unknown territory, you need to know the essentials of life at UW. 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)
- Cookies (for those late nights when you are doing assignments, and have the munchies)
- Basic tools (screwdriver, bottle opener, etc)
- Laundry and dish detergent
- Quarters (for laundry, parking, video games, etc)
- Aspirin or equivalent medication
- Bandages

## 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 75 cents or \$1 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 Gestapo Transit (Kitchener *was* called Berlin at one time, you know). This organisation runs about 15 routes in and around K-W, including UW. It costs \$1.30 to ride the bus but monthly passes are available if you plan to use the bus frequently. There are also university passes which last for a term and are really useful.

For a list of useful bus routes you can head downtown to the Transportation Centre 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 (Islington Station) on Fridays and from Toronto on Sundays. The prices are \$9.00 one way and \$17.00 return.

"Please don't throw things at the wastebasket. You're going to start a war in here and then we'll get people throwing paper airplanes. That's for algebra, everyone knows that."

Anonymous



## 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 Faculty.

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 (Ralph Stanton) 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 founder 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. *mathNEWS* 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.

## Hierarchy of Life

Mathies  
 The Natural Log/The Pink Tie  
*mathNEWS*  
 C+D  
 Coke Classic  
 MathSoc  
 Bombshelter  
 The Far Side  
 Star Trek  
 $e$   
 Blue Jays  
 Math Frosh  
 SCOOPS  
 HP Calculators  
 $\pi$   
 12:30 classes  
 Other Frosh  
 $\eta$   
 TA's  
 Campus Sculptures  
 The William G. Davis Centre  
 Engineers  
 High school down the road (WLU)  
 EngSoc  
 $\xi$   
 Kitchener Transit  
 Dept. of Co-operative Education and Career Services  
 High school down the highway (Guelph)  
 Coke II  
 Village "Food"  
 IBM  
 Fed Hall  
 Needless Hell  
 Keeners  
 Imprint (Imp'tint)  
 Artsies  
 UWO (Western)  
 8:30 classes  
 The Tool  
 Hierarchies of things

"Why is what I've written there true? Well, what I've written there isn't true, so I don't have to answer that question. However, having said that, there must be some reason why I wrote it."

D. Taylor

"I said you couldn't be smooth and kinky at the same time, then somebody put up his hand and said, 'What about whipped cream. sir?'"

J. MacKay

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

C. Cobourn

"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

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

P. Hoffman

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

L. Smith

"Sequences and series aren't that tough. All you need is a bottle of scotch and an hour."

P. Ponzio

"Pure mathematicians have wet dreams over this stuff... don't quote that in *mathNEWS*; I'm in enough trouble already."

I. McGee



## 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 MathSoc 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. It takes a generally conservative or skeptical 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 mathNEWS excerpts).

*mathNEWS* (what you're reading now) is funded by MathSoc and presents an interesting mix of information and humour in a magazine format. *mathNEWS* 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 produces a bi-weekly 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 Centre 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.

## 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 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.

"I looked at the Final the other day and I'm happy to see that we covered some of the material."

C. Cutler

"Why do people laugh whenever I ask how the midterm went?"

Anonymous

"I don't like giving out extensions, but I don't like lynch mobs either."

C. Durance

"I'm sure you stand at home in front of the mirror practising that look — that look so that the prof can't tell what you're thinking or whether you're thinking."

J. MacKay

"If that makes sense to you then you have a big problem."

C. Durance

"Don't ask me why I've done it. That's irrelevant."

F. Goodman

"I'm tired. I wanna go home. I don't wanna play school anymore."

Anonymous Student

"For an engineering student a calculator is the breath of life. Take it away from them and it reduces them to stammering idiocy."

Anonymous

"When I first started teaching engineering here, they told me to give the engineers a very hard assignment during the first week of classes just to shock them, to set the tone for the rest of the term. 'Better yet,' I asked, 'why don't I just kill a couple?'"

Anonymous

"I take the Christian attitude toward exams... it is more blessed to give than to receive."

R. Wentzell

"Let me do this in a more confusing way because it will probably help you to understand."

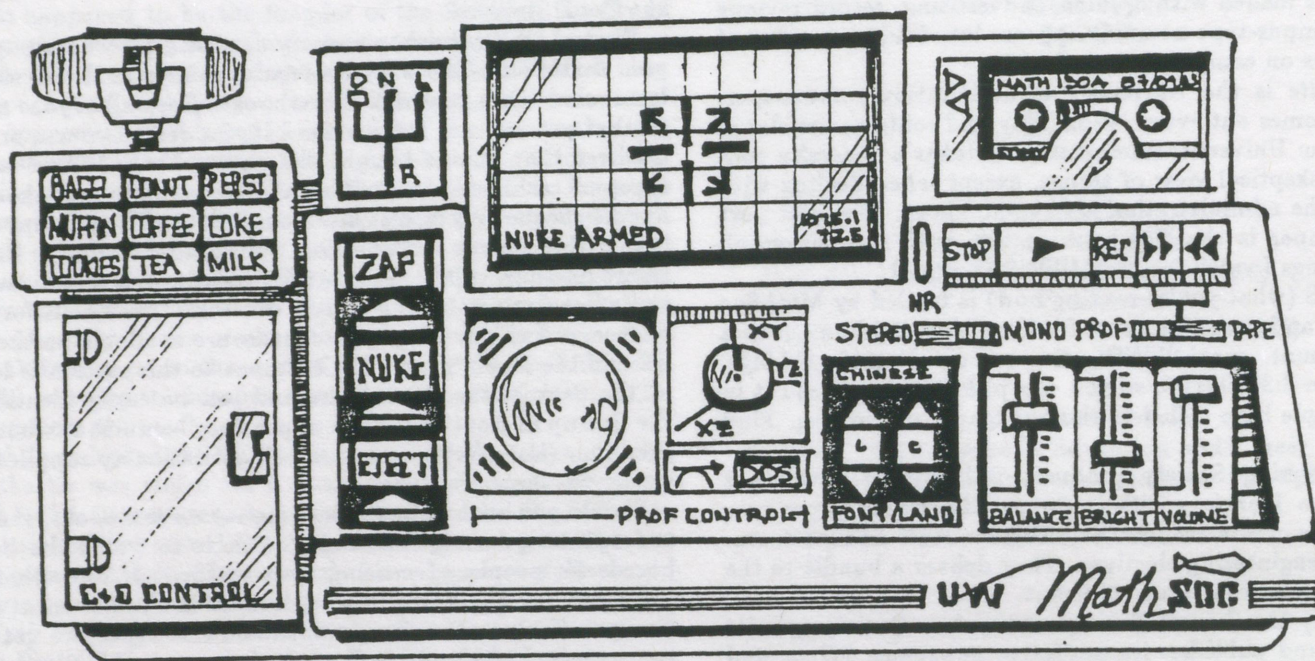
L. Cummings



## The Prof Control Panel

Mark XLII

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<sup>TM</sup>:** Move your prof around in 3-space with an ergonomically designed Trackball and continuously variable oblique Plane Control<sup>TM</sup>. 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<sup>TM</sup> 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 48GX 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  $\pi$  (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 is a time-honoured tradition at U(W). It was inaugurated by our fabulous football team, the Waterloo Warriors, who are finally showing the spark that may lead them to victory in the Vanier Cup!

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!

## mathNEWS' Top Ten Excuses for Late Assignments

10. I had to remove all the vulgarities.
9. I sold the publishing rights on it to Penguin Books and they haven't sent it back yet.
8. Oh, I thought you meant September 24th *next year*.
7. My horoscope said, 'Harm will befall you if you get everything done.'
6. My friend wasn't done his assignment on time, and I had to clone it.
5. I was too sober to finish it.
4. I have to walk past Laurier on the way here and I was mugged by a bunch of football players.
3. The 'e' key on my typewriter was busted and I had to look in a thesaurus for synonyms.
2. 50 dollars? I thought you said 20 dollars!
1. I was reading mathNEWS.

"Ever wonder how to measure the inner radius of a doughnut? You whip out your handy-dandy six-inch."

Anonymous

"I could go up on observer 1 or go down on observer 2...let me rephrase that...I didn't say anything...if I see that in mathNEWS..."

R. Oldford



## Things Frosh Should Know

(or at least the stuff we're willing to tell you)

- **OSAP** only works for 8-stream or regular. If you are on 4-stream you may have to be reassessed and could owe the government \$\$\$.
- Some of the profs don't use all of the texts on the course list. Go to your first class and ask. You usually don't need your texts the first week of classes. When you are ready to buy, remember to check the used bookstore (a couple of times) located in the basement of the Campus Centre.
- Make sure to buy your tunnel pass early.
- **DON'T MISS THE MATH FROSH ORIENTATION EVENTS.** If you don't come to the events, you might find yourself in a class of 250 strangers. This is the best place to meet friends in Math and have fun at the same time.
- Remember to go to the Bombshelter on your birthday (provided you are of age) to get your birthday mug. Your 19th earns you a t-shirt too.
- **PAY YOUR FEES BY MAIL OR MEET THE KILLER LINE-UPS FROM HELL!!!**
- Volunteering is fun! You may find people to help you with your courses and have some fun with. Volunteering may also get you free stuff but if it doesn't at least you'll have the undying gratitude of MathSoc.
- Bring ID to get your student ID card. Picture ID is the best: a driver's licence, passport, age of majority card, etc.
- Have a resume ready if you are in 4-stream. There are several good copy places on and around campus.
- If you live in Village, don't eat anything you can't identify. If you live on your own, don't eat anything in the fridge that moves.
- Get a locker in the math building the first week of classes. First come, first served. Sign up in the MathSoc office, MC3038.
- Government jobs don't pay well. (I know. I had one.)
- All Math students have an UNIX Internet computer account on the undergrad network. Ask a friend, the Computer Science Club, or a MFCF consultant about how to log on. Activate your account and change the password ASAP to make sure it doesn't get terminated or stolen.
- Speaking of which, the Computer Science Club is a great club to be a member of if you plan to use those computer accounts.
- It's rainy here. Bring an umbrella. It's not called WATER-loo for nothing.
- The Princess Cinema is a good, cheap place to see second run or interesting (weird if you like that word better) movies. Schedules available in the Campus Centre.
- The Math C+D (coffee and donut shop) on the 3rd floor of the math building is more than just coffee and donuts. There is good, cheap food for lunch, dinner, or a snack.

- People in co-op had better be prepared to work ANYWHERE. Don't count on living at home. You could get a job anywhere, from Redmond, BC to Halifax, NS.
- You know the rainy thing, it works for snow too. Bring boots, BIG BOOTS.
- If you got over 80% in OAC English, you don't have to write the ELPE. If you do have to write, don't write anything fancy; just write a clear, legible essay.
- Make sure you have five (5) courses. Trust me on this one.
- Get a calendar, just in case.

Rapunzel and friends.

## 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 federated 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 130/134, 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. CSC) have offices in the Math and Computer building, so drop by and see what's going on.

MED

"I've mixed things up here, obviously, and you should be confused, and if you aren't confused then something is wrong. But if you are confused then things are OK because you should be."

L. Cummings



# GridWord Know-How

*GridMonster Kow-Tow*

This is an attempt to clarify the peculiarities of the *mathNEWS* GridWords. The GridWord (the crossword puzzle on the back page for those of you who have not yet gotten that far) has two different sets of clues for two different solutions, one conventional and one cryptic. The conventional puzzle is a standard crossword puzzle, the solutions being synonyms for the clues. It is perhaps a bit more difficult than normal, because of the lower word density.

The cryptic is similar to, but very distinctly unlike, what fans of the New York Times would recognise. Generations of Mathie GridMonsters have been raised on a diet of Grids from their predecessors and the style has diverged in time. Defining the particular style is difficult; it is not clear who will be doing the Grids this semester and it is frequently not the same person in successive issues.

The clues give two definitions for the word: a direct definition and a cryptic definition. This may sound like a piece of cake, (Two clues for each word!) but it can be difficult to distinguish the two parts. At the end of the clue, the number of letters in the answer is given.

At first the cryptic clues may seem meaningless or nonsensical. The GridMonster hopes that they make sense when deciphered. (Having a slightly warped mind helps sometimes.) A clue may be any one, sometimes more, of the following types. Look for keywords or patterns.

**Anagrams** One or more words in the clue are jumbled to give the solution. Key words: scrambled, agitated, mixed, sorted, confused, etc.

"A beat agitates for the diminution" = ABATE from the letters A BEAT

**Construction** The answer is assembled from parts given in the clue. Key words: follow, after, before, on, etc.

"He was first to build a water barrier" = ADAM build from A DAM

**Alterations** Split words or switch them around. Key words: in, around, split, turn, back, up, etc.

"Content and very quiet in the hay" = HAPPY, from PP (= pianissimo) in HAY

**Dropping Letters** Remove a letter from a word. Key words: headless, tailless, endless, heartless, etc.

"The head of the host was lost to the wealthy bird" = OSTRICH, from HOST without the H plus RICH

**Double Clues** Two definitions are given for the answer.

"An article of French tea" = THE, an article and the French word for "tea"

**Hidden** The answer is hidden in the letters of the clue.

"The band is tantalising from afar" = DISTANT from band IS TANTALISING

**Homonyms** The answer to part of the clue sounds like the solution. Keywords: anything related to hearing or sound.

"I hear the crew will be mean" = CRUEL from CREW'LL

**Other Instructions** Other words may indicate how to construct the solution. Possibilities: every other, alternately, initial, etc.

"Every other oblong marsh" = BOG, every other letter from oBlOnG

"Particle is initially a trio of moons" = ATOM, the first letters of A Trio Of Moons

**Special Words** By convention some words have special one or two letter meanings for word building. Examples: direction: N, S, E, W; hesitate: ER; loud, fail: F; love, nothing: O; fifty: L; current: AC; and many, many others.

Even having read these instructions, you may find that GridWords can be quite discouraging. A first pass through the clues may produce no results, but a little work, some searching for keywords and a bit of fiddling should get most answers. As you get solutions, you will get a better feel for the clues and they can lead you to other solutions. Checking against the solutions and looking for the connections is another way to gain understanding. Persevere! Even the GridMonsters were neophytes once.

A GridMonster

## Introductory GridComments

*GridWord 101*

Welcome, frosh, to your  $n, n \in \{3, 4, 5, \dots\}$  year stay at UW. 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 *mathNEWS*, providing you with hours of Friday-morning diversion while your Calculus prof drones inexorably to some unknown goal. This GridWord has two purposes: to expose you to some things that you, as a frosh, will find important; and to introduce you to the wonderful world of cryptic crosswords. For those of you who are unfamiliar with this particular realm of crosswords, it involves clues in two parts, one being a definition of the word, and the other being a sort of play on words that lead to the correct solution. For more details on how to solve a cryptic, there is an article elsewhere in this issue.

For those of you who are adventuresome enough to complete either the Conventional or the Cryptic grid (or both), you can submit your entry to the BLACK BOX across from the Comfy Lounge. A name will be drawn at random from all the correct entries and they will win a fabulous *mathNEWS* prize!!! The lucky winner will be drawn on the first *mathNEWS* production night in September.

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.

Slave Boy and his sidekick Punchy

(after giving a midterm) "...If any of you feel the need to buy me a beer afterwards, I'll be in the Bombshelter until 12."

K. Frackleton

"Problem #62 involves two people in motion in a canoe... No, it's not that kind of problem."

P. Eastman





## Cryptic

### Across

1. Avoid donating the undergarment (4,3,4)
7. Endless like is sickening (3)
9. Miss a shot around the coffee cup (3)
10. A wager with a greek spells trouble (8)
11. Surround love with  $\pi$ ? Only in Hawaii (3)
12. Back to Jamaica, so make quick notes (3)
13. Not done, work at the vertex (4)
16. Heart attack! It's our mother (5)
17. Hear off-blue insects exercise in water (8)
18. Worry regarding foot treatment (4)
20. Summer shirts in Nova Scotia for adolescents (5)
21. A good outcome from bad pool (7)
24. Prickly pair (5)
25. Mr. Sato proofs find him above (4)
26. Not I, Cal! Listen to the water device (8)
27. Worm is as luggage is to me (1,4)
28. A yes is bad? Simple! (4)
31. Don't run! You'll break the vase (3)
34. Pink dye (3)
35. Clean bar, but left with sea leeches (8)
36. Ban Shaq's league (3)
38. Guru tries to find groove (3)
39. Cur at rest is surrounded by deer. He raised the dead! (11)

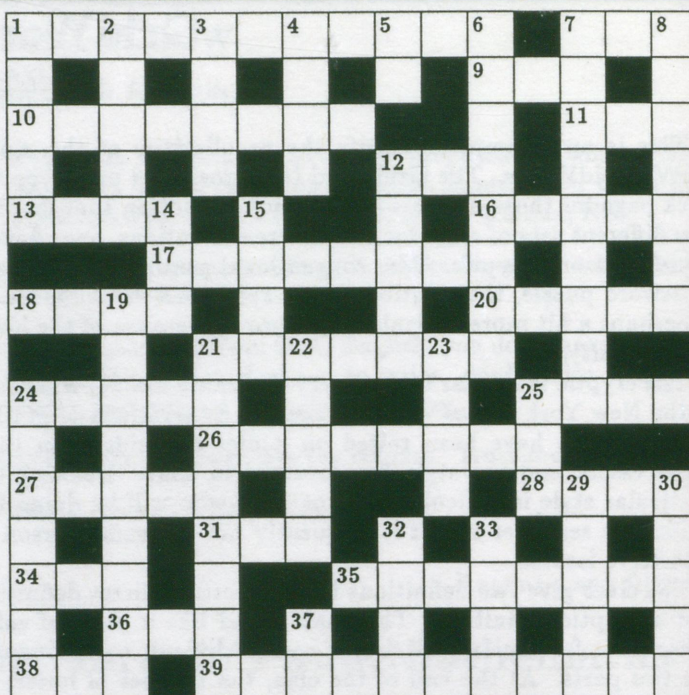
### Down

1. A grin is terrible with wheat (5)
2. Beginning avacado dip is poor and uninteresting (5)
3. Arty carrying device (4)
4. You're some female sheep (4)
5. Magic town (2)
6. Expert experiments have people up in arms (8)
7. Not correct (9)
8. Not days of old (7)
12. Orange electricity (5)
14. During dinner, not after (3)
15. Hear the animal house. Lou is African (4)
19. Great! Go beyond passover finale! Y'hear? (9)
21. One lug rains down (8)
22. Stir a while. Cahoun! Run alternately! (5)
23. Bad fius (4)
24. Likely, Cher will surround a new part of her life (7)
25. The beer sounds like a sickness (3)
29. A person north of England wears this (5)
30. Stop for ye old parlor(5)
32. Rail rides to refuge (4)
33. The only time for a bad cone (4)
37. We in the United States (2)

## Conventional

### 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. The MacLab uses one (3)
12. Cowardly dog (3)



13. The engineers and mathies each have one (4)
16. Incompetent, incapable (5)
17. It will enable to finish your work (8)
18. Hindu goddess of destruction (4)
20. An elected representative (5)
21. A small warship (7)
24. To soak or steep (5)
25. Exam preparation technique (4)
26. Final exam month (Fr.) (8)
27. You'll see a lot of these in Calc. and Alg. (5)
28. One of your gods for the next four months (4)
31. Faculty MathScot and well-known function (3)
34. The real name for DavisWorld (abbrev.) (3)
35. This wonderful metropolitan centre (8)
36. In Latin, thus (3)
38. Foot part (3)
39. 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)
12. Students aren't popular in this country (5)
14. Suffix for Hi-Fi and Sky (courses) (3)
15. At a distance (with *from*) (4)
19. Your CS course is one (9)
21. A movie shown in AL on the weekend (8)
22. In disguise (fig.) (5)
23. Opus' instrument (4)
24. The campus rag (7)
25. You won't have any of this after an all-nighter (3)
29. You should be aware of regulations (5)
30. You are one (5)
32. Less than whole (4)
33. It is good and right that you are the least of all. (4)
37. The cave where they keep the engineers. (abbrev.) (2)