March 7, 2014
Open House

Department of Mathematics and Statistics

Statistics

Dr. Myron Hlynka

Dr. Sudhir Paul

Statistics

Dr. Severien Nkurunziza

Dr. Abdul Hussein

Applied Mathematics

Ronald Barron, (Ph.D. Carleton)
Applied Mathematics, Computational Fluid Dynamics

Richard J. Caron, (Ph.D. Waterloo)
Optimization, Operational Research

A. Y. Alfakih, (Ph.D. Michigan)
Combinatorial optimization, semidefinite programming, distance geometry

Analysis

Dr. Zhiguo Hu

Dr. Mehdi Monfared

Dr. Dilian Yang

Algebra

Dr. Ilya Shapiro

Dr. Wai Ling Yee

Dr. Animesh Sarker, full time lecturer

Justin Lariviere – Director, Math & Stat Learning Centre

Secretaries

- Rose Spence
- Dina Labelle
- Maxine Ebegbuzie

10th Floor Lambton Tower

mthsta2@uwindsor.ca

mthsta1@uwindsor.ca

mthsta@uwindsor.ca

Other Faculty

- Dr. Abida Mansoora
- Dr. Jing Wang
- Dr. Shabnam Chitsaz
- Dr. Mohammed Hassanzadeh
- Dr. Medhi Garrousian
- John Battaglia

Professors Emeriti

- Dr. Frank Lemire
- Dr. Dan Britten
- Dr. Tim Traynor
- Dr. Purna Kaloni
- Dr. Krish Duggal
- Dr. Om Chandna
- Dr. Karen Fung

Specializing

- **Degrees offered:**
  - General Mathematics
  - Honours Mathematics
  - Honours Mathematics and Statistics
  - Honours Mathematics and Computer Science
  - Honours Concurrent Bachelor of Mathematics & Bachelor of Education
  - Other Combined Programmes
- Degree requirements depend on programme
- If you wish to concentrate on a particular area of mathematics, take courses starting from 2nd or 3rd year accordingly

First Year Schedule

Fall	Winter
MATH 120: Linear Algebra I	MATH 190: Mathematical Foundations
MATH 140: Differential Calculus	MATH 141: Integral Calculus
CS 140: Intro to Algorithms and Programming I	CS 141: Intro to Algorithms and Programming II
Economics 110?	Economics 111?
?	?

Second Year Schedule

Fall	Winter
MATH 220: Linear Algebra II	MATH 221: Linear Algebra III
MATH 215: Vector Calculus	MATH 216: Differential Equations
STAT 250: Intro to Probability	STAT 251: Intro to Statistics
Theory of Interest 392 ?	?
?	?

Third Year Schedule

Fall	Winter
MATH 314: Intro to Analysis I	MATH 315: Intro to Analysis II
MATH 321: Abstract Algebra	MATH 318: Complex Variables
STAT 350: Probability	STAT 351: Statistics
Linear Programming? Combinatorics?	Numerical Analysis? Graph Theory?
Stochastic Operational Research ?	Number Theory ? Stochastic Processes?

Fourth Year Schedule

Fall	Winter
Group Theory?	Functional Analysis?
Measure Theory?	Regression/Time series?
Math programming?	
?	?
?	?

MATHEMATICS AND STATISTICS: PROGRAMS AND COURSES

The regular load is 5 courses per semester and the General Program requires 30 courses while the Honours Programs require 40 courses.

Required Math Courses and Typical Schedule (***A mark of at least C- in the required in each of these courses***)		**General (3 years)**	**Honours (4 years)**		
Term	***Course***	***General***	***Math***	***Math & Stats***	***Math & Comp. Sci.***
Year 1: Fall	62-120: Linear Algebra I	X	X	X	X
	62-140: Differential Calculus	X	X	X	X
Year 1: Winter	62-190: Mathematical Foundations	X	X	X	X
	62-141: Integral Calculus	X	X	X	X
Year 2: Fall	62-215: Vector Calculus	X	X	X	X
	62-220: Linear Algebra II		X	X	X
	65-250: Introduction to Probability	X	X	X	X
Year 2: Winter	62-216: Differential Equations	X	X	X	X
	62-221: Linear Algebra III		X	X	X
	65-251: Introduction to Statistics	X	X	X	X
Year 3: Fall	62-314: Introduction to Analysis I		X	X	X
	62-321: Abstract Algebra		X	X	X
	65-350: Probability			X	
Year 3: Winter	62-318: Complex Variables	X	X	X	X
	62-315: Introduction to Analysis II		X	X	X
	65-351: Statistics			X	

Program Requirements / Course Credit Requirement	***General***	***Math***	***Math & Stats***	***Math & Comp. Sci.***
Number of Courses Listed above	9	14	16	14
Math and Stats Courses 200 level or above (at least a C-)	4			
Math and Stats Courses 300 level or above (at least a C-)		8	4	2
Stats Courses 300 level or above (at least a C- grade)			2	
Computer Science 60-140 and 60-141 (Taken in first year)	2	2	2	2
Comp.Sci. 60-100, 212, 214, 231, 254, 255, 265, 315, plus 3 at 300 level or above.				11
Math, Stats, or Comp.Sci at 200 level or above (at least C-)				
Arts and Social Sciences courses	4	4	4	

SECOND TEACHABLE

Biology	Six Biology courses which satisfy the requirements for an Honours degree in Biological Sciences, including 55-140 and 55-141
Chemistry	Six Chemistry courses which satisfy the requirements for an Honours degree in Chemistry, including 59-140 and 59-141
Computer Science	Four Computer Science courses which satisfy the requirements for an Honours degree in Computer Science, including 60-100, and two courses from any area of study
Physics	Six Physics courses to satisfy the requirements for an Honours degree in Physics, including 64-140 and 64-141

Adding Majors, Minors

- Combined Honours:
  - Core courses + 2 courses at 300 level or higher
- Minor:
  - 6 courses

Student Support

Services and Scholarships

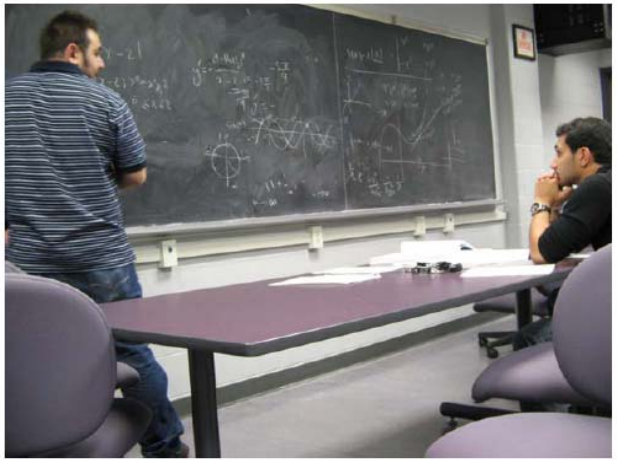
Scholarships

- **Automatic Entrance Awards**
- Granted to a student entering university directly from high school. No matter which program you choose, you will automatically be considered for University of Windsor entrance scholarships. For students applying for admission through the Ontario University Application Centre (OUAC), we will review your grades in May (final and interim) to determine your eligibility for scholarships on the basis of your best six U or M level grades (or equivalent) and will forward a letter to you at that time. Final grades attained after this point will not change the offer of scholarship.

Automatic Entrance Award	Scholarship	Average	Value/term
$3,200	Renewable Entrance Scholarship	80 - 83.9%	400
$4,800	Renewable Entrance Scholarship	84 - 86.9 %	600
$6,400	Renewable Entrance Scholarship	87 - 89.9%	800
$10,000	Renewable Entrance Scholarship	90 - 93.9%	1250
$12,000	Renewable Entrance Scholarship	94 - 95.9%	1500
$14,000	Renewable Entrance Scholarship	96 - 97.9%	1750
$16,000	Renewable Entrance Scholarship	98 - 100%	2000

Renewable entrance awards may be granted for a maximum of eight continuous academic terms provided a student registers on a full-time basis and maintains the required 11.0 cumulative average.

Mathematics and Statistics Learning Centre



MSLC

- Open M-F 10 am-4 pm
- No appointments necessary for free tutoring
- Jobs:
  - Some senior students employed per term as tutors (4 hours a week)
  - Graders (100 hours per term, 30 graders per year)
  - Jobs available starting second year
  - $18.99 / hour
  - Chances of getting jobs depends on number of math courses taken and grades (min. 10.0 GPA)

Teaching

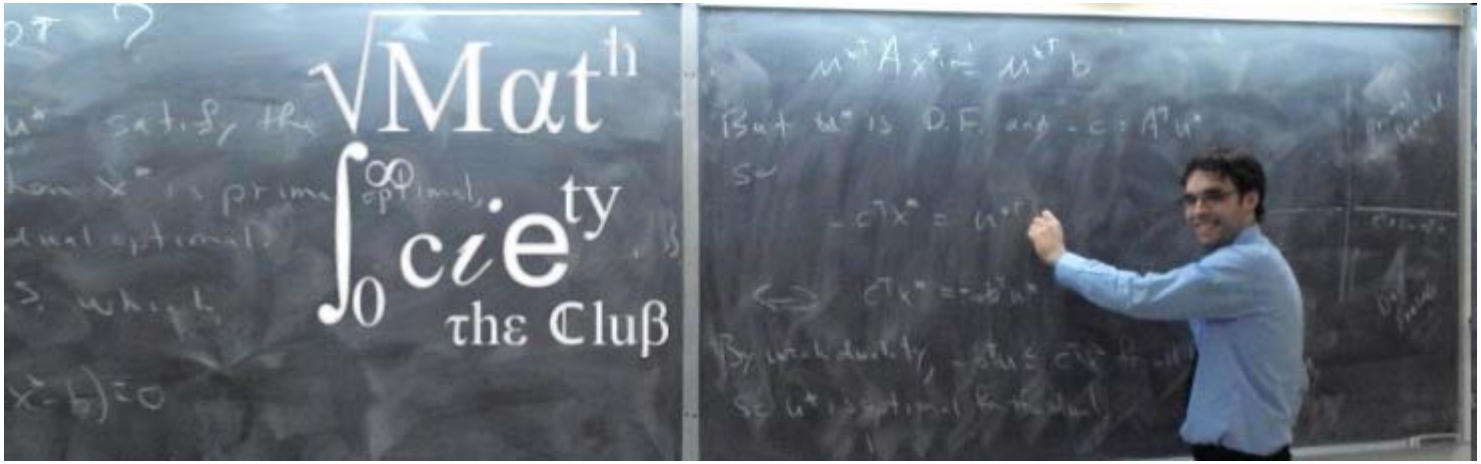
- Calculus
  - 3 hours lecture + 2 hours tutorial / week
  - Tutorial sections maximum 25 students

- Many faculty have won teaching awards

Oustanding Scholars Award: Sample Projects

- Research:
  - Optimal location of fire stations for a local municipality using Geographical Information Systems (GIS).
  - Limiting probability matrix computations
  - Optimal Vaccination Scheduling
  - M/M 1 Transient Queues and Path Counting
  - Computing signed Kazhdan-Lusztig polynomials

- Learning:
  - Actuarial Science workshops
  - Mathematics competitions:
    - Putnam Competition preparation
    - outreach activities for elementary/high school students and teachers
  - Setting up a tutoring program for at-risk students



- Pi Day.
- March 14, 2014 (03-14)
- 1:59 p.m.
- Math & Computer Science

http://mathsocietyclub.wordpress.com/

Student Success

Academic and Professional

Nicole Lemire, B.Sc. Math 1991

Nicole Lemire is a mathematics professor at the University of Western Ontario.

She held a University Faculty Award from NSERC from 2002-2007.

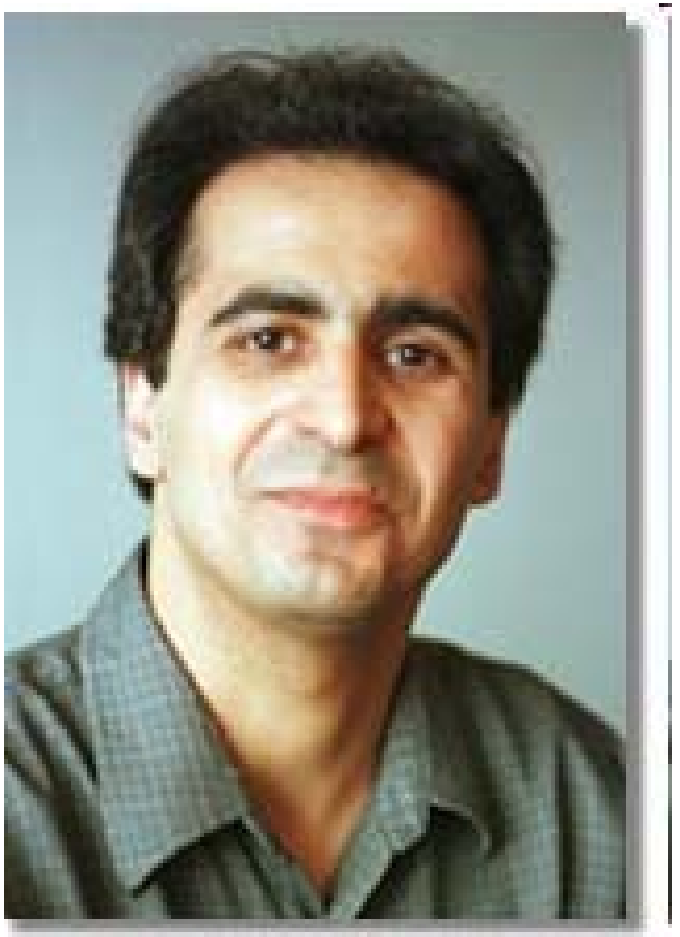
Vahid Tarokh, M.Sc. Math 1992

Academic Appointments:

- Perkins Professor and Vinton Hayes Senior Research Fellow of Electrical Engineering, Harvard University, 07/05-Present
- Gordon McKay Professor of Electrical Engineering, Harvard University, 07/02-06/05
- Associate Professor of Electrical Engineering and Computer Science, MIT, 09/00-06/02

Industrial Appointments:

- Department Head , AT&T Labs-Research, 11/99-08/00
- Principal Technical Staff Member, AT&T Labs-Research, 04/98-10/99



Kevin Atkinson, B.Sc. Math & CS, 1993

Handout

Avatar characters Neytiri and Jake make final preparations for an epic battle. Former Windsorite Kevin Atkinson was one of hundreds of computer technicians who helped create the creatures and planet Pandora for the movie.

Bringing sci-fi to life

Ex-Windsorite creates effects for Avatar

TED SHAW
The Windsor Star

Blink and you'll miss Kevin Atkinson's name in the credits of Avatar.

But the Windsor-born computer programmer is basking, in the reflected glory of one of the most successful movies ever made.

Atkinson was among the hundreds of special effects technicians who created the alien planet of Pandora for James Cameron's sci-fi hit.

Working at the New Zealand studios of Weta Digital, he played a small but significant role as a software developer and engineer.

"I mostly worked on the application which was used to paint textures on all the models in the 3-D world we made," said 43-year-old Atkinson, who has a math degree from the University of Windsor.

All the creatures, including the eight-foot Na'vi, and much of the background in Avatar were computer-generated.

"It's a testimony to the realism Weta achieved," he said, "that some people have a hard time grasping that the Na'vi are actually completely CG."

Even Atkinson's mother, Mary, in Windsor asked if blue-skinned Neytiri, the movie's main character, is a "real woman."

Handout

Former Windsor resident Kevin Atkinson poses on the balcony of his home in Seatoun, New Zealand. The computer software engineer worked on the movie Avatar.

Avatar, he said, employed computer effects that are 10 times more complex than any film ever made. Weta, based in Wellington, N.Z., also created special effects for Peter Jackson's Lord of the Rings trilogy, and more recent science-fiction films District 9, Jumper and The Day the Earth Stood Still.

"I personally think Neytiri deserves to be considered among the great screen goddesses of cinema history," said Atkinson.

One of the programs Atkinson worked on helped create the textural effects on Neytiri's skin — the "bumps and creases and pores" that bring her to life.

His infatuation with the imaginary Neytiri is a reflection of his love for his new home in Seatoun, a seaside suburb of Wellington, where he and his wife Julie moved in June.

Following university, Atkinson worked in computer design in the auto industry in Windsor and Detroit. A stint at First Technology Safety Systems, a Plymouth, Mich., firm that manufactures crash-test dummies, taught him marketable skills in robotics, 3-D animation and computer design.

But it was a British-made music video for Bjork's 1999 hit, All Is Full of Love, that convinced him to try his hand at film.

The Chris Cunningham-directed video about the love of two robots used many of the computer effects Atkinson had encountered in auto design. "I thought it was the most beautiful thing I'd ever seen," he said. "Gorgeous, sexy, perfect."

The video is on permanent display at New York City's Museum of Modern Art.

Atkinson was drawn to the video on another level — he is a musician and while in Windsor had a band with his sister Sarah called Teach Yourself Piano.

He began hiring himself out as a computer effects consultant and eventually posted some of his work online. Two Los Angeles-based visual effects houses offered him work, but he turned them down to freelance from his Windsor home.

Weta found samples of his work on reddit.com, a video site that is voted on by web users. His demo got 30,000 hits, and was posted on reddit.com's front page.

The day after it was posted, Weta offered him a job. Although he is on a year-to-year contract with Weta, he developed software while working on Avatar that may be used on future projects.

"After scraping by in Windsor," Atkinson said, "we now live in a beautiful house on the ocean. Needless to say, I'll stay as long as they want me."

tshaw@thestar.canwest.com
or 519-255-5849

Carolyn Britten, B.Sc. Math

- Carolyn Britten is now director of Phase I Clinical Trials at Hollings Cancer Center, South Carolina.
- She specializes in cancer research.

Pierre Jraiche, B.Sc. 1996

2008 Recipient of the Alumni Odyssey Award

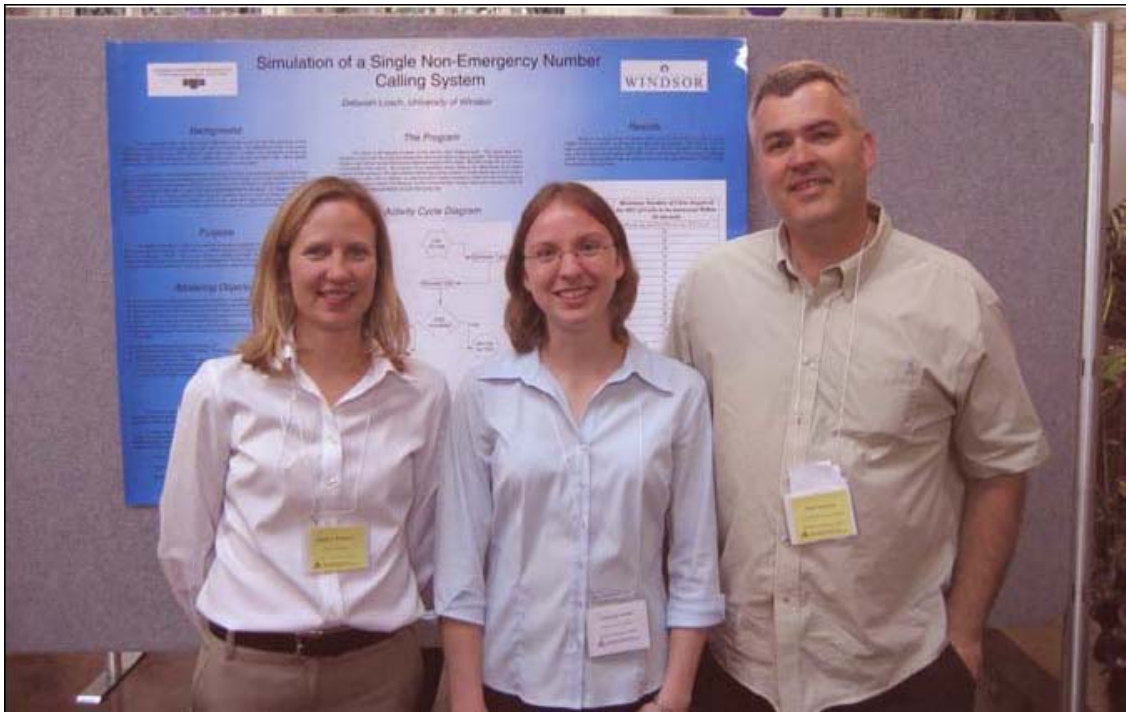
For the past 11 years, Pierre has been an employee of Watson Wyatt Worldwide, a major global Human Resources consulting firm. Pierre is a consulting actuary and business leader in the Retirement Practice for Watson Wyatt Worldwide. Particularly consulting in various areas of retirement plan valuation and design, Pierre leads a team of approximately thirty-five associates in the Michigan offices. Pierre and his team deal with clients such as The Dow Chemical Company, General Motors, MAHLE Industries, and other major North American retailers.

In addition to the Odyssey Award, Pierre is a recipient of the Board of Governor's Medal. He holds great respect among his co-workers, and with the University of Windsor. Since Pierre began working at Watson Wyatt, the company annually visits campus to offer information and recruitment seminars to our Mathematics students. In addition, he maintains a connection to the University of Windsor as an Adjunct Associate professor in the department of mathematics and statistics which is perhaps his greatest contribution to the University. His presence in the classroom as an instructor and mentor severs as great inspiration to our students. Pierre is a genuine individual who is able to provide practical, and much appreciated, career advice.

Debbie Loach, B.O.R. 2007

Debbie Loach was awarded first prize in the inaugural Student Poster Competition at the National Meeting of the Canadian Operational Research Society.

She now has a job with Maple Leaf Foods.



Jackie Malette, B.Sc. Math and Stats 2007

Lancer alumna Jackie Malette was named a Top Eight Academic All-Canadian for two consecutive years. Now she is in residency as an MD in London, Ontario.

Bradley Howell, B.Sc. Math 2006, M.Sc. Math 2009

Brad works for the stability assessment division of the financial stability department of the Bank of Canada in Ottawa. The hiring process for the Bank of Canada is quite stringent. Applicants write serious mathematics and statistics tests to assess their skills and they will interview 200 people and hire just a handful.

Chris Reaume B. Math 2012

Hi Professor Hlynka:

When I first started working at Towers Watson I thought I was 'behind the game' because all of the recent hires came from actuarial undergrad programs at larger universities, such as Michigan, Michigan State, or Central Michigan, but to be completely honest, in comparing how well I'm doing with my actuarial exams to most associates at the company, I feel I got a much better and well-rounded education. Having taken both theoretical and application-based math & stats courses, I've found that's helped me tremendously with studying for exams, especially exam C. I heard from so many people at Towers Watson that there's a huge amount of information you have to memorize for Exam C, but if you have the theoretical background required to derive many of these 'ugly formulae,' there's not a whole lot of memorizing, it's more a matter of understanding.

26/06/2013

After a Math degree, then what?

- Teaching (elementary,high school, college)
- Master's or PhD (Math, Stat, Operations Research, Economics, Industrial Engineering, Management Science, Biostatistics)
- Actuary
- Med School
- Operations analyst
- Stat Canada, Health Canada, Pharmaceutical
- Data analyst (data mining, data analytics)
- Aug 5, 2009 - "I keep saying that the ***sexy*** job in the next 10 years will be ***statisticians***," said ***Hal Varian***, chief economist at Google. "And I'm not kidding.".

Actuarial Science

- Finance, risk, valuation
- Can work on:
  - Insurance, disability, awards and damages
  - Pensions
  - Investments
  - healthcare costs
- To become an actuary:
  - NO specialized degree
  - Just write Society of Actuaries' professional exams
- Available at Windsor:
  - Three courses in Actuarial Science + topics courses
  - Weekly study sessions (including lectures) for exams P and FM
  - Test site for professional exams
  - Good relationship with Towers Watson in Detroit
  - Summer internship opportunities for strong students (end of 3rd year)

SOA Professional Exams

- **Preliminary Exams:**
  - P: Probability
  - FM: Financial Mathematics
  - MFE: Models of Financial Economics
  - MLC: Models for Life Contingencies and Statistics
  - C: Construction and Evaluation of Actuarial Models

- **Associateship Courses:**
  - 5: Fundamentals of Actuarial Practice Course
  - 6: Associateship Professionalism Course

- **Fellowship Exams:**
  - 7: Advanced Finance
  - 8: Financial Economic Theory and Engineering
  - Other options available for different tracks: finance, investment, annuities, retirement, group health

- Windsor students should be able to write exams P, FM, and MLC by graduation

Actuarial Science at Windsor

- Exam P:
  - STAT 250, STAT 251
- Exam FM:
  - MATH 392 Theory of Interest
- Exam MLC:
  - MATH 490 Actuarial Mathematics I
  - MATH 492 Actuarial Mathematics II
- Exam MFE:
  - STAT 455-22 (reading course)
- Exam C:
  - STAT 455-24 (reading course)
- VEE (Verification by Educational Equivalent)
  - 41-110, 41-111 Economics
  - 72-270, 72-271 Finance
  - 65-455-09 Statistics (reading course)

Actuarial Science

- For more information, visit:
  - Society of Actuaries:
    www.soa.org/education/exam-req/
  - Dr. Myron Hlynka's webpage:
    web2.uwindsor.ca/math/hlynka/actuarial.html
  - **University of Windsor *Actuarial Mathematics Information Session (Towers Watson)***

    Tuesday, November 12, 2013 4:30-6:30 p.m.

    263 Chrysler Hall South

Top Jobs 2011

- 1. Software Engineer
- 2. Mathematician
- 3. Actuary
- 4. Statistician
- 5. Computer Systems analyst
- 6. meteorologist
- http://www.forbes.com/2011/01/07/best-worst-jobs-2011-leadership-careers-employment-best_slide_3.html

Putnam Math Contest

- For integers n>0, let c(n) satisfy c(1)=1, c(2n)=c(n), c(2n+1)=$(-1)^n$ c(n).

  Find Σ_1^{2013} c(n)c(n+2) (B1, December, 2013)
- Training sessions: Fall term each year.
- Award for top performer at U of Windsor

- Thank you!

- hlynka@uwindsor.ca
- web2.uwindsor.ca/math/hlynka/
- web2.uwindsor.ca/math/hlynka/reasons.html
- Myron Hlynka