

## Points of Interest

There are several co-curricular activities on campus to promote learning and recognition of student achievement. These include the Economics Club and Math Club, sponsorship of student research papers for the Undergraduate Symposium, trips to the Economics Club of Detroit, and the annual awards ceremonies conducted by the Departments of Mathematics and Economics. The Department of Mathematics honors one student each year as the Outstanding Actuarial Student. Internships are available with local actuarial firms.



## Alternate Degree Options

If an Actuarial Science major wishes to change to a new major, the best alternate option would be to pursue a double major in Mathematics and Economics or Economics with Mathematics and Statistics concentrations.

## Future Graduate Studies

An Actuarial Science major or a double major in Economics and Mathematics can pursue graduate studies in Mathematics or Economics at EMU (or other institutions leading to M.A. or Ph.D.) This is important for those who would like to pursue a career in teaching and/or research. At EMU, the following graduate programs in Mathematics and Economics are offered:

- M.A. in Mathematics
- M.A. in Applied Economics
- M.A. in Health Economics
- M.A. in Trade and Development
- M.A. in International Economics and Development
- M.B.A. (College of Business)

For information about admissions and graduate teaching/research assistantships, contact the Economics Department 734.487.3395 and Mathematics Department 734.487.1444.



EMU Student Center

## Scholarships & Financial Aid

Majors in this program may wish to apply for a number of University-wide scholarships. For information, call the Financial Aid Office at 734.487.0455 or visit: [emich.edu/finaid](http://emich.edu/finaid)



Pray-Harold

### Mathematics Department

515 Pray-Harold,  
Ypsilanti, MI 48197  
Phone: 734.487.1444  
[www.emich.edu/math](http://www.emich.edu/math)



**Dr. John Curran**  
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### Economics Department

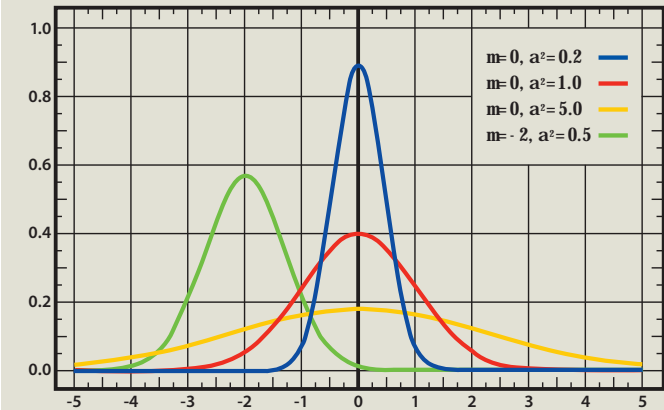
703 Pray-Harold,  
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# College of Arts & Sciences

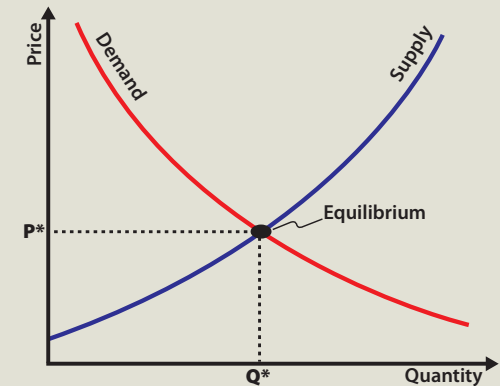
# Actuarial Science & Economics



Present value of an annuity:

$$PV = \frac{C}{i} \left[ 1 - \frac{1}{(1+i)^n} \right] = C \left[ \frac{1 - (1+i)^{-n}}{i} \right]$$

where:  $n$  = number of periods,  $C$  = amount of cash flows,  
 $i$  = effective periodic interest rate or rate of return.



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## Why Actuarial Science & Economics?

Actuarial Science (ASc) involves the study and applications of mathematical and statistical tools to evaluate risk in various financial products and professions such as insurance, finance and other industries. In stock market terminology, actuarial science is like a “derivative” — a by-product, if you will, extracted out of mathematics and statistics. Integration of economics with actuarial science is essential given almost everything in which actuarial science applies involves economics.

Students in ASc are academically prepared with a wide variety of interrelated subjects that include probability, mathematics, statistics, finance, economics, financial economics, and computer programming.

## B.A. or B.S. in Actuarial Science

This joint program, of the Economics and Mathematics departments, is a very job-specific major. It prepares students to successfully complete examinations offered by the leading actuarial societies in the insurance industry. For more information go to: [emich.edu/math/programs](http://emich.edu/math/programs).

## Job Opportunities



## Examples of Job Characteristics

- **Traditional Life Insurance:** ASc focuses on the analysis of mortality, the production of life tables, and the application of compound interest to produce life insurance, annuities and endowment policies.
- **Health Insurance:** ASc analyzes rates of disability, morbidity, mortality, fertility and other contingencies.
- **Other Insurance:** ASc is applied to property, casualty, liability, and general insurance.
- **Pension Industry:** ASc assesses the costs of alternative strategies with regard to the design, funding, accounting, administration, and maintenance or restructuring pension plans.
- **Social Welfare Programs:** Actuaries in Social Security Administration (SSA) plan and direct programs of actuarial estimates and analyze SSA-administered retirement, survivors and disability insurance programs.
- **Criminal Justice:** ASc models are increasingly being applied in U.S. criminal justice sentencing guidelines.

“We love math & econ in actuarial science.”



Dipti Arya



Cameron Copeland



Brooke Muonio

## Projected 2013-2014 PayScale Table

Ranks and Major	u-rate (%)*	Starting Salary (\$)	Mid-Career Salary (\$)
2. Actuarial Sc.	0.0	58,700	120,000
8. Computer Sc.	5.6	59,800	102,000
13. Statistics	6.9	52,500	98,900
15. Economics	6.3	50,100	96,900
16. Appl Math	4.1	52,800	96,200
22. Mathematics	5.0	49,400	88,800
26. CIS	5.6	51,900	87,200
27. Finance	4.5	49,200	87,100
41. Marketing	5.9	42,100	80,200
52. Accounting	5.4	45,300	74,900

\*Unemployment rate (u-rate): George Town University Center on Education and the workforce.

\*\*The ranking is out of 129 majors and over 1000 US Universities.

Salaries: <http://www.payscale.com/college-salary-report-2014>

## Admission and Degree Requirements

This is a very job-specific program for students with a strong aptitude for mathematics and statistics. A minimum GPA of 3.5 in mathematics is highly desired. Since this is a joint program of the Departments of Mathematics and Economics, students are encouraged to consult with advisers in both departments as soon as the interest to pursue the major prompts.

Actuarial Science majors must receive at least 15 credit hours in the program at the 300 level or above at EMU. The total credit hour requirement is 124.

- General Education: 40 hours
- Restrictive courses: 12 hours (Accounting 6 hours, Computer Programming and Economics 3 hours each)
- Required Mathematics courses: 26 hours
- Required Economics courses: 18 hours
- Restrictive Economics electives: 6 hours
- University Electives: 22 hours



## Mathematics and Economics Faculty

The Mathematics Department has a variety of specialties in pure and applied mathematics, statistics, and mathematics education. The Economics Department has well qualified faculty specializing in applied economic fields applicable to actuarial science, such as health economics, cost benefit analysis, and risk & uncertainties. All faculty teaching in this joint program hold Ph.D. degrees.

The actuarial program organizes preparation seminars for the actuarial examinations and is instrumental in helping students secure internships and entry-level jobs.