

Advice for mathematics majors enrolled in or considering
the *actuarial science concentration* and for any LSU
students considering being actuaries

Actuary is consistently rated as one of the best jobs in America. In almost every category, such as work environment, employment outlook, job security, growth opportunity, and salary, a career as an actuary is hard to beat.

- paraphrased from www.beanactuary.org

Preparation in actuarial science at the undergraduate level is largely mathematics, statistics, and computer science for the business world and risk management. LSU actuarial science concentration students who did not want to be actuaries have found direct employment or gone into master's degree programs in analytics, statistics, financial engineering, and business.

The Actuarial profession.

Actuaries analyze the costs of risk and uncertainty. They need to learn mathematics, statistics, and finance. It is a small profession—there are about 23,600 jobs for actuaries. This is small compared to some of the more familiar professions: There are 792,500 lawyers, 2,955,200 registered nurses, and 713,800 physicians. There is a good outlook for growth in the decade 2016-2026 with 22% growth predicted (average growth is predicted at 7%).¹

Students who have a good gpa, fulfilled their VEE requirements, passed 3 actuarial exams, and have had an internship, have found entry level actuarial positions. The LSU program includes courses for all VEE requirements and 6 actuarial exams.

Considering being an actuary?

Being an actuary can be a great profession to enter, but it has to suit your personality, temperament, and work habits. It requires that you are willing to devote many hours to self-study in order to pass a series of rigorous exams. *By preparing for and taking Exam FM/2 or Exam P/1 early in your program, you can find if you have the temperament to prepare for a long series of exams.* See #1 and #3 below.

More information on the exam requirements and the profession is available at www.beanactuary.org.

For any LSU student—regardless of their major—who wants to prepare to be an actuary, there is a basic stripped-down core of courses that is the minimum to get started. It consists of 29 hours of mathematics (1550, 1552, 2057, 2085, 3355, 4056, 4058, 3050), 3

¹ *Actuaries : Occupational Outlook Handbook*, U.S. Bureau of Labor Statistics, US Department of Labor.

hours of accounting (2001), 3 hours of finance (3716), 6 hours of experimental statistics (3201 and 4142), and 3 hours of economics (2030); but some courses in the list have prerequisites and there are many other courses to improve job and advancement prospects.

Advice about the program of study.

1. Take MATH 3050 Interest Theory the fall after MATH 1552. Take Exam FM/2 at the first opportunity after completing MATH 3050. This will likely be in December or February.

2. Take MATH 3355 (Probability) at the earliest opportunity. Take MATH 3355 *immediately* after completing MATH 2057. You should complete MATH 3355 before the end of your 2nd year and earlier if you enter with advanced placement in Calculus.

3. Take Exam P at the first opportunity after completing MATH 3355. Assuming that your MATH 3355 instructor covered the entire syllabus, you will need to study and practice intensely for two weeks before taking Exam P. I recommend taking it at the first opportunity, which is usually within a few weeks of completing MATH 3355. If you attempt Exam P and fail it, it does not matter. You only lost the fee. There is no stigma associated with failing an exam.

Passing Exam P is substantially harder than getting an A in MATH 3355, so you should devote some time to study for Exam P while completing MATH 3355 it will help you get an A in probability too.

4. Do *not* take MATH 4020 for your capstone requirement. Try to obtain an internship for the summer after your junior year. Use the internship as your capstone course. See the information at:

<https://www.math.lsu.edu/~smolinsk/Actuarial%20capstone%20credit.pdf>.

You will likely need to have an exam behind you and some programming to have a good application for a summer internship. You may be able to get an internship earlier too.

If you cannot obtain an internship then EXST 4087 will serve as a capstone and contribute your background, knowledge, and possibly an applied statistics minor (see #9 below). If EXST 4087 is not offered, then the Associate Chair of Mathematics has allowed EXST 4025 as a substitute.

8. ECON 2030, ACCT 2001, FIN 3716, and MATH 4056 are part of the credentialing process by the Society of Actuaries (SOA) called *Validation through Educational Experience* (VEE). You must receive a B- or better in each italicized class below to receive VEE credit from the SOA. The VEE requirements have prerequisites outside of mathematics and are met at LSU in the following sequences:

- *ECON 2030 or both ECON 2000 and ECON 2010*
- *ACCT 2001 and FIN 3716*
- *MATH 4056*

You should complete them before you graduate, but you do not have to finish them early in your program. ECON 2030 is a prerequisite for FIN 3716, so you must take it first.

9. If you follow the recommended program, then you will have 18-21 hours of free electives in your 120-hour program. You can use them to take courses that interest you, improve your credentials, or improve your knowledge. Here are some suggestions.

- ✓ If you are on track to become an actuary consider the following:

Highly recommended:

FIN 3440 Risk and Insurance (recommended prior to job interviews)

FIN 4850 Financial Derivatives (preparation for actuarial exam Exam IFM)

EXST 4142 Introduction to R and Statistical Data Mining (preparation for actuarial exam Exam SRM).

Recommended:

MATH 4058 Elementary Stochastic Processes

ECON 4630 Introduction to Econometrics

ECON 4633 Time Series Data Analysis

If you wish to do some independent study for an exam beyond P or FM, then you may take a MATH 4999 but it must be arranged with the instructor in advance and approved by an advisor as fitting in your schedule.

- ✓ You may wish to get a minor in business administration: ISDS 1100, MGT 3200, MKT 3401. Nine hours required. Additional credentials are always helpful. It may be useful for those who do not ultimately pursue a career as an actuary but may consider a one-year master's program in business or analytics.
- ✓ Get a minor in applied statistics: EXST 4050 and two of EXST 4012, EXST 4025, or EXST 4087. Nine hours required. Again, additional credentials are always helpful. If you cannot obtain an internship for your capstone requirement, then take note that one of these courses may serve as your capstone requirement (see # 4). It may be useful for those who do not ultimately pursue a career as an actuary but may consider a one-year master's program in business, analytics, or statistics.
- ✓ Students interested in asset management, and being so called "quants" with asset management firms such as mutual funds or hedge funds should include ECON 4630, FIN 3717, FIN 3826, FIN 4828, and FIN 4850 as electives and consult the Undergraduate Advisor in the Department of Finance in the E. J. Ourso College of Business, Kurtay Ogunc <financeadvisor@lsu.edu> for advice on other electives. Students interested in a focused program in asset management should see www.math.lsu.edu/~smolinsk/math&finance.pdf.

11. Participate in the Actuarial Student Association, which is the student professional club. It is your connection to students who have found internships and passed exams and a chance to meet professionals (see the club's website: www.math.lsu.edu/asa).

12. Some knowledge of MS Excel is useful to have and to put on a resume. Students who want to get some excel training may take a free online course. Course information

can be found by following the path starting on your MyLSU page and may require downloading software:

MyLSU > Computing Services > Microsoft IT Academy

and

<http://grok.lsu.edu> > Training > Microsoft IT Academy

The course is supposed to prepare you to take a certificate exam from Microsoft to get a MOS: Microsoft Office Excel Certificate. The exams do have a fee (but there may be an LSU discount). Exams are specified by an exam number, e.g., 602 for Excel 2007, 882 for Excel 2010, and 420 for Excel 2013.

13. See the advice from LSU alumna, Winnie Sloan, ACAS and recent alumnus Taylor Daigle: *Success in the Actuarial Concentration: A College Timeline* linked at www.math.lsu.edu/~smolinsk/SuccessInTheActuarialConcentrationSloan&Daigle.pdf.

14. Group projects are a worthwhile for a resume and for a discussion point in an interview. Some ways these may be obtained are:

- EXST 4142 (EXST 3999 with Professor Bin Li until changed in the LSU catalog)
- EXST 4087
- Summer Internship
- Math 4020

15. Communication skills are important in working as an actuary and obtaining a job as an actuary. Several courses in Communication Studies may be taken to fulfill your general education requirements.

Humanities general education courses:

CMST 1061 Fundamentals of Communication

CMST 2040 Introduction to Performing Literature

CMST 2060 Public Speaking

CMST 2063 Argumentation and Debate

Social science general education course:

CMST 2010 Interpersonal Communication

A sample program is below.

The program is a complete program for students on the 2019 catalog. Students on older catalogs may use it as a guide need to work with their academic advisor to fulfill catalog requirements.

* denotes courses that satisfy an SOA VEE requirement.

** denotes courses that prepare for an SOA exam.

*** denotes courses for data science.

Semester 1 (14 or 15 hours)

MATH 1550 (5)

CSC 1253
ENGL 1001 English Composition
General Education - Natural Science sequence (Biological or Physical Science) part 1
Lab 0-1

Semester 2 (14 or 15 hours)

MATH 1552 (4)
CSC 1254
MATH 2020 (bridge course)
General Education - Natural Science sequence (Biological or Physical Science) part 2
Lab 1-2

Semester 3 (15 hours)

MATH 2057
MATH 3050^{2,**} (5)
EXST 2201 (4)
ENGL 2000 English Composition

Semester 4 (16 hours)

MATH 3355**
MATH 2085
ACCT 2001*
ECON 2030* (fulfills a General Education 2000-level social science requirement)
EXST 3201 (4)

Semester 5 (15 hours)

MATH 4056*
FIN 3716*
CSC 3102***
General Education course - Arts
Free elective (3) FIN 3826**

Semester 6 (15 hours)

Free elective (3) highly recommend FIN 3440³
Free elective (3) highly recommend FIN 4850^{4,**}

² A student only has to meet the admission requirements of the College of Science to enroll in a 3000-level course: Earned 24 semester hours; have a 2.0 gpa on both LSU and cumulative averages, and have passed ENGL 1001, all mathematics courses, and all science courses with a grade of "C-" or better.

³ FIN 3440 is listed in the LSU catalog with a BLAW 3201 prerequisite. Finance has agreed to admit actuarial students to FIN 3440 who have had FIN 3716 (or FIN 3715) and MATH 3050. The mainframe registration system does not prevent a student from registering for FIN 3440 without having taken BLAW 3201, so they do not need any special attention.

CSC 3730*** (new in 2019-2020) or CSC 2730***

Free elective (3)

MATH 2025 or 2030 (second gateway class—department may remove in 2018)

Semester 7 (16 hours)

Free elective (3) highly recommend EXST 4142^{5,**}

MATH 4040** or MATH 4045**

Foreign Language Course (4)

General Education - Natural Sciences (Alternate Science)

General Education course - Social Sciences - recommend one of CMST 1061, 2040, 2060, or 2063

Semester 8 (15 hours)

MATH 4041** or MATH 4046**

Capstone (MATH 4020, MATH 4997, or EXST 4087)

Free elective (3)

General Education course - Humanities (English/Honors 2000-level)

General Education course - Humanities

⁴ FIN 4850 is listed in the LSU catalog as *Open only to Finance majors; open to others with permission of department* and has FIN 3826 as a prerequisite, which is also preparation for Exam IFM. Finance will admit actuarial students to FIN 4850 who have had FIN 3716 (or FIN 3715) and MATH 3050. Students will have to be manually added by the Finance Department's UG advisor, (presently Kurtay Ogunc). Nevertheless, both FIN 3826 and 4850 are recommended.

⁵ Being piloted fall 2018. Approval proceeding through Experimental Statistics.