

Plans for life after graduation by William Yslas Vélez

PRELIMINARIES for graduate school

1. If your goal is to apply to graduate school then begin talking to faculty and graduate students as early as possible.
2. Take the time to speak with your teachers, giving them information about yourself so that they can use to write letters on your behalf.
3. Become involved in scientific and educational initiatives, and take a leadership role in some of them. Examples
 - a) research, including summer internships in universities and businesses
 - b) tutoring
 - c) problem solving groups
 - d) the local math club
 - e) outreach activities to the local high schools
 - f) universities oftentimes provide leadership training opportunities
 - g) participate in undergraduate mathematics conferences
 - h) create a resume

SAMPLE RESUME

COURSEWORK

1. Students often pursue a doctoral program in an area different from their undergraduate degree.
 - a) Profiles of UA graduates
 - b) <http://math.arizona.edu/ugprogram/prospective/alumniprofiles.html>

- c) Flexibility of the mathematics major
2. In determining which courses to take (and you should take more than the minimum), you should look where you are headed to.
 3. It is common that math majors pursue graduate programs other than mathematics
 - a) Mathematical Biology: <http://www.math.ohio-state.edu/graduate/apply>
 - b) Computational Neural Biology
 - c) Financial Engineering/ Economics:
<http://www.math.ncsu.edu/finmath/index.html>
 - d) Engineering: <http://meng.engineering.cornell.edu/>
 - e) Whatever
 4. Coursework:
 - a) The very good schools require graduate courses and research experience
 - b) The good schools in pure math would like students to have: year-long course in algebra and real analysis, plus semester long courses in linear algebra and complex variables, topology would be nice
 - c) The good schools in applied math would like students to have: real analysis, linear algebra, familiarity with computing software, numerical analysis, differential equations
 - d) Programs in statistics would like students to have: real analysis, linear algebra, probability, statistics. Minors in economics and the biological sciences help.
 - e) Programs in mathematics education vary a great deal. Most require a degree in math and some teaching experience.
 - f) Coursework for programs of study, other than mathematics, need to be investigated
 - g) The biological sciences are a real growth area. You might consider taking the basic year-long courses in biology and chemistry

PREPARING TO APPLY

1. In submitting documents for admission, the student should understand the impact that these documents can have. It is these documents that will sell your case.
2. Letters of recommendation are required and students should plan early for these. When asking for a letter of recommendation, it is a good idea to meet with the faculty member in person and provide a resume.
3. Decrease the workload on the faculty who write for you by providing addressed envelopes and paperwork that has been filled out.
4. Many applications are now done on-line. Be organized in presenting the information to the faculty member.
5. Whom should you ask for letters?
6. GRE: <http://www.ets.org>
 - a) General and subject test information can be obtained at the above site.
 - b) Some departments require these while others just recommend it.
 - c) Low subject GRE test scores may cause departments to wonder about your preparation.

Computer-Based General Test

- The General Test is given year-round at computer-based test centers in the United States, Canada and many other countries.
- Appointments are scheduled on a first-come, first-served basis.
- You may take the General Test (computer-based and/or paper-based) only once per calendar month, and no more than five times within any 12-month period. This applies even if you canceled your scores on a test taken previously.

To register to test in the United States, American Samoa, Guam, U.S. Virgin Islands, Puerto Rico and Canada, register online or call **1-443-751-4820 or 1-800-GRE-CALL (1-800-473-2255)**. To register to test at an international location, register online or contact the appropriate Regional Registration Center. **REGISTER EARLY TO GET YOUR PREFERRED TEST DATE.**

Paper-Based General Test

- Paper-based General Test administrations are offered in areas where computer-based testing is not available.
- **Not all test centers are open on all test dates. Download the Test Center List (PDF) for testing locations.**
- **Be sure to check the score report mailing date when selecting a test date.**

2009-10 Test Dates

10/24/09 02/06/10

TEST DATES¹

United States and Puerto Rico	Supplementary Test Center ² and Monday Administration ³	09/04/09	12/18/09
Registration Receipt Dates at ETS	Regular Registration	09/18/09	01/04/10
	Late Registration ⁴	09/25/09	01/08/10
Other Locations, Including U.S. Territories	Supplementary Test Center ² and Monday Administration ³	08/28/09	12/11/09
Registration Receipt Dates at ETS	Regular Registration	09/11/09	12/28/09
	Late Registration ⁴	09/18/09	01/04/10
APPROXIMATE SCORE REPORT MAILING DATE		12/04/09	03/19/10

7. Statement of purpose

- a) Avoid rambling
- b) Avoid grammatical and punctuation errors
- c) If there is an anomaly in your grades, it should be explained
- d) The statement is read very seriously and you should have others review it before sending it in.

8. Most students applying to graduate school do not know what area they want to go into. If you do, look over faculty interests and mention the work of some of the faculty in your statement.

9. Apply to VIGRE schools

<http://www.nsf.gov/awardsearch/progSearch.do?jsessionid=85F4171BE79049EE0AF5080101B5B51D?SearchType=progSearch&page=2&QueryText=VIGRE&ProgOrganization=DMS&ProgOfficer=&ProgEleCode=&BooleanElement=false&ProgRefCode=&BooleanRef=false&ProgProgram=&ProgFoaCode=&RestrictActive=on&Search=Search#results>

10. Each time you apply to a school, it costs you money. In applying to schools you should have a safe list of schools, schools where you would very likely get in. You don't want to be in limbo at graduation time. You need to consult with faculty on this one.

10. If you are going to graduate in December, think about applying to spend a semester at a national lab or Budapest/Moscow.

An example: http://www.dep.anl.gov/p_undergrad/

FUNDING YOUR GRADUATE STUDIES

1. National fellowships

a) http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=6201&org=NSF

2. When you apply to a graduate school, you most likely also automatically apply for financial support.

3. In many instances, departments are more interested in funding students who will proceed to the PhD, instead of just an MS degree.

4. You should also consider professional masters degrees, though it is harder to find support for these programs.

<http://www.ams.org/tools/masters.html>

5. What to do between graduating and entering graduate school

a) opportunities are limited, most REUs do not support senior who have graduated, but some do (like the one that you are in.)

b) national labs and companies are possibilities.

5. Thanking your supporters after you get in

Applying for jobs instead of graduate school

Much of the same advice applies to this situation. However, there is one real difference..

You should have a minor that supports your mathematical studies, and that minor should be technical. A computer science minor is very supportive in applying for jobs.

Employers would like to see some evidence that you

a) Do more than is required of you

b) Have good communication skills and can work as part of a group

c) Summer internships in industry are a real plus

Contact your Career Center to see how to begin the process of meeting with recruiters. Oftentimes, Career Centers have workshops on interviewing skills (maybe even mock interviews)

Sometimes mathematics keep track of their graduates. Think about applying to firms that have hired math majors from your department.

Begin early, do not wait until your last semester.

Think about applying for positions in the federal government. Many require security clearances and these clearances may take as long as nine months to obtain. If you are going this route, then think about applying for internships with these government agencies.

Some places to consider in the federal government.

- a) CIA analysts: <https://www.cia.gov/careers/jobs/analytical-positions/index.html>
- b) US Census Bureau: <http://www.census.gov/hrd/www/jobs/mathstat.html>
- c) US Dept of State: <http://www.state.gov/careers/>

My own experiences as an applied mathematician

Applied mathematics, in the workplace, is oftentimes undergraduate level mathematics, but applied with a profound knowledge of the subject.

That is one reason for continuing on to earn a Master's degree, since this solidifies your knowledge of undergraduate level mathematics.

SAMPLE RESUME

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Career Goal: I am seeking a summer internship in an industry or organization where I can apply my mathematical knowledge and my analytical/problem-solving abilities. I have augmented my mathematical studies with courses in computer science and I am interested in finding a position where I can combine mathematical analysis with numerical simulations.

Education:

The University of Arizona, 2007-present	Valley High School, Graduated 2007
Major: Mathematics. Minor: Computer Science	Boca Raton, California
GPA: 3.4, Major GPA: 3.5, Minor GPA: 3.4	
Expected graduation date: May 2011	

College credit earned in high school: I earned college credit for first semester calculus.

Computer skills: I have a solid general knowledge of computers as well as proficiency in Java and C.

Relevant coursework completed by May 2010:

Mathematics courses: Calculus 1, Calculus 2, Vector Calculus, Introduction to Linear Algebra, Formal Mathematical Reasoning and Writing, and Analysis of Ordinary Differential Equations, Complex Variables

Computer science courses: Introduction to Computer Science, Program Design and Development, and Object-Oriented Programming and Design

Other Relevant Courses: Two semesters of Chemistry and one semester of Biology

Work Experience:

I was an Undergraduate Teaching Assistant in Fall 2009 for business math. My supervisor was Dr. W. Valentoso. I tutored algebra four hours per week and developed several Excel spreadsheets for the business mathematics course for Dr. Valentoso. I also held weekly review sessions for the students in his course.

I held a Undergraduate Research Assistantship in Spring 2010 under the direction of Dr. Warren. I am investigating the practicality of reconstructing phase information from images taken in two different focal planes (the near field and the far field). This research will continue into next academic year.

Honors/Awards: I received Honorable Mention for Fall Semester 2007 and was on the Dean's List for the other semesters. I am an out-of-state student and have been receiving out-of-state tuition waivers as a scholarship. I have also been part of the Honors College since my first year.

Activities: Since Fall 2008, I have been a member of Math Cats, the Undergraduate Mathematics Club. I have participated in several outreach activities sponsored by this club. I am also a member of the Microsoft Student Users Group: A club dedicated to the discussion of programming technology and theory, both of Microsoft and in general.

Volunteer Work: I was a volunteer mathematics tutor at a middle school (five hours per week) during the academic year, 2008-2009.

Citizenship: USA

Availability Date: May 31, 2010 – August 13, 2010