Pre-Calculus
Three Communities – One Goal
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Career Opportunities in Mathematics

Wolfgang Kliemann
Iowa State University
Overview

1. Quantitative skills at all levels
2. Quantitative literacy
3. BS studies in Mathematics
4. Graduate studies in Mathematics
Quantitative skills at all levels

CareerCast’s “10 best jobs” based on criteria such as income, outlook, environmental factors, stress and physical demands:

• 2011: Software engineer, Mathematician, Actuary, Statistician, Computer system analyst

• 2012: Software engineer, Actuary, Human resources manager, Dental hygienist, Financial planner – with mathematician and computer system analyst still in top 10

• All these jobs, with the exception of human resources manager and dental hygienist require substantial mathematical/statistical/quantitative skills.

• General tendency: higher level and higher paying jobs require additional quantitative skills on all levels: literacy, BS degrees, MS degrees, PhDs
CareerCast reports about the job market in 2011/12

“In recent years, the job market has increasingly rewarded math whizzes at the expense of less technical professionals. Actuary, Mathematician and Accountant have all ranked among the best jobs in America by offering a pleasant work environment, good salary and healthy job security.”

“Continuing a recent trend, a majority of the jobs that rank in the top 10 this year require proficiency in math, science or technology, and all of them require higher education or specialized training.”
Quantitative literacy

- Basically all vocations and general citizenship now require quantitative literacy
- The common core – mathematics lays out a minimal frame for mathematical/statistical literacy
- Thorough teaching of the common core – mathematics provides basically everybody with needed vocational and citizenship skills
- All STEM related professions require additional quantitative training, usually provided through community colleges and colleges
- Many non-STEM professions require additional mathematical/statistical training, such as business, economics, psychology and advising, education professions etc
- Teaching mathematics today means teaching everybody for their future endeavors
BS studies in Mathematics

• A Bachelor in Mathematics prepares for
  – Secondary education – mathematics
  – Wide variety of jobs in industry, government, NGOs
  – Graduate school in mathematics
  – Graduate school in many STEM, business and social sciences fields

• Math+ and similar programs are intended as second majors in mathematics to prepare undergraduates for successful graduate studies in quantitatively oriented fields, such as engineering, economics, statistics, computer science, finance, bioinformatics, physics, chemistry, actuarial science, etc

• For more information see http://www.math.iastate.edu/Undergrad/MathPlus.html
BS studies in Mathematics – 2

• Jobs for mathematicians are often not advertised as ‘searching for a mathematician’, but Mathematics majors may end up in a job with a title such as Engineer or Analyst

• Sectors in which mathematicians find employment are, among others
  – Arts and entertainment, e.g. music software
  – Finance and insurance, e.g. actuary
  – Government, e.g. DOD, DOE, NSA as analyst and others
  – Health care, e.g. medical school, analyst, programmer
  – Information technology, e.g. analyst, developer
  – Legal services, e.g. attorney specializing in IP, tax, complex business transactions
  – Management of companies, e.g. software development
  – Manufacturing, e.g. systems engineer
  – NGOs, e.g. analyst
  – Transportation, e.g. developer, scheduling
  – Utilities, e.g. engineer, scheduling analyst
Graduate Studies in Mathematics

• Graduate studies in mathematics prepare for
  – Teaching mathematics from high schools to research universities
  – Research in mathematics and application fields
  – A wide variety of ‘professional’ careers

• Teaching careers
  – High schools
  – Community colleges require a MS degree
  – 4-year institutions usually require PhD degree
  – For in-service teachers: Master of School Mathematics
  – Lecturers at research universities
Graduate Studies in Mathematics – 2

• Research careers
  – Universities
  – National laboratories
  – Industry laboratories
  – 4-year colleges

• Professional careers
  – Government – NSA, EPA, NIST, CDC, NIH
  – Industry – financial, computer, software, instrumentation, high tech
  – NGOs – data consulting, analyst
Online Resources

• For more information see the web pages

http://www.math.iastate.edu/Undergrad/UGopps.html#career
http://www.maa.org/careers/index.html
http://www.ams.org/profession/career-info/early-careers/early-careers
http://math.arizona.edu/ugprogram/prospective/careers.html#cs
http://www.ams.org/programs/students/undergrad/undergrad#careers
http://www.ams.org/careers/
http://www.math.uiuc.edu/UndergraduateProgram/careers/career.html