

Math Majors in William & Mary

Junping Shi

Department of Mathematics
William & Mary
Virginia, USA



WILLIAM & MARY

CHARTERED 1693

Why major in math?

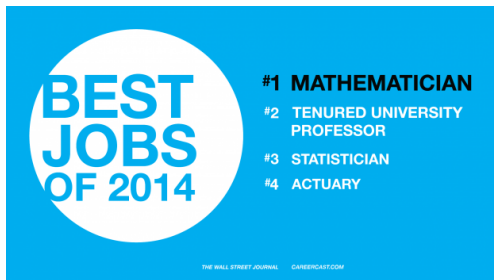


Figure 1: Average Projected Salaries by Discipline – Bachelor's Degrees

Broad Category	2015 Average Salary
Engineering	\$62,998
Computer Science	\$61,287
Math & Sciences	\$56,171
Business	\$51,508
Agriculture & Natural Resources	\$51,220
Healthcare	\$50,839
Communications	\$49,395
Social Sciences	\$49,047
Humanities	\$45,042

Source: *Salary Survey January 2015*, National Association of Colleges and Employers

Number of Math Majors in the Rise

Number of Math Majors in William & Mary 2008-2021

	2008	2009	2010	2011	2012	2013	2014	2015
Math	36	37	35	34	51	42	45	
Grad School	31	30	24	27	26	22	30	32

	2016	2017	2018	2019	2020	2021	2022
Math	65	70	56	70	75	60	82
CAMS	5	16	19	23	25	27	28
Total	70	86	75	93	100	87	110
Grad School	40	40	>32	>36	> 44	> 25	

In 2014, Math majors were 2.9% of all W&M graduates, 11.7% of STEM majors;

In 2018, Math/CAMS were 4.8% of all W&M graduates, 17.8% of STEM majors.

In 2008-2019, 55.89% of Math graduating majors continued to graduate schools.

In 2020, Double major 63: CS(20), Econ(15), Psyc(4), Busi(4), Phil(3)

In 2021, Double major 33: (Math only) CS(11), Econ(7), Phys(4), Psyc(3), Biol(2), DataSci(2)

CAMS=Computational & Applied Mathematics & Statistics, since 2016

2008-2019 data from National Student Clearinghouse, 2019

W&M Math Graduates

Job Placements

- Accounting/Consulting firms: Deloitte, Ernest-Young, Accenture, KPMG.
- Financial/banking firms: Capital One, Jane Street, Two Sigma.
- Federal/State Government: FTC, DoD, FBI, CIA
- IT companies: Google, Facebook, Microsoft, IBM
- Military: Navy Research Center,
- Secondary Teaching: high schools, middle schools in Virginia

Grad School

- Math: UC Berkeley, U Chicago, Dartmouth, Duke, Rice, U Mich, U Va, U Md, U Az, U Wash, UNC, UIC, GA Tech, Lehigh
- Stat, Data Sci, OR: MIT, UC Berkeley, Yale, U Chicago, Cornell, Columbia, Northwestern, U Va, NC St, GA Tech, Lehigh
- Physics, Economics: Harvard, Yale, UC Berkeley, Cal Tech, U Mich, U Wash, Duke, Georgetown
- Engineering, CS: Columbia, Harvard, U Va, GA Tech, Va Tech, UIUC
- Med, Biol, Law: U Penn, UCLA, Stanford, Harvard, Cal Tech

W&M Math/CAMS Graduates in 2020

- Total 100: Standard(27) Applied(44) CAMS Math Bio(17) CAMS Appl Stat(8)
- Double major 63: CS(20), Econ(15), Psyc(4), Busi(4), Phil(3), Phys(2)
- Grad school: Doctoral(≥ 15), Master(≥ 29)
- Grad school: W&M(9), Columbia(3), CalTech(2), UCB(2), MIT(2), CMU(2), UVa(2), NWU(2), UCD(2). Other(1): Harvard, Yale, Stanford, Cornell, Duke, Oxford, PKU, UMich, UWash, NotreDame, UIUC, UTexas, UColorado, Cold Spring Harbor, Georgetown.
- Grad school areas: mathematics, (bio)statistics, computer science, data science, business analytics, operations research, mathematics secondary education, atmospheric chemistry, applied physics, linguistics, genetics/plant biology/quantitative biology, biology, theoretical chemistry, biomedical engineering, biomedical informatics, industrial engineering, medicine, financial engineering, classics.
- Workforce: Jane Street, US Army, Google, CICC, Accenture, Mercer, Cornerstone Research, Virginia Public School System, Eldridge Industries, Aon, Deloitte, Booz Allen Hamilton, National Cancer Institute, MITRE, KPMG, CGI.

W&M Math/CAMS Graduates in 2021

- Total 87: Standard(23) Applied(35) Teaching (2) CAMS Math Bio(17)
CAMS Appl Stat(10)
- Grad school: Doctoral(≥ 6), Master(≥ 17)
- Grad school: W&M(3), Harvard(2), Columbia(2), UPenn(2). Other(1):
Yale, Cornell, Duke, U Chicago, NYU, Emory, VaTech, Tufts, UWash,
UBC, U Oregon, Rutgers.
- Grad school areas: mathematics, (bio)statistics, computer science, data
science, business analytics, operations research, mathematics secondary
education, physics, biology, finance.

Math Majors in W&M

- 1 Standard Concentration
- 2 Applied Mathematics Concentration
 - 1 Computational Mathematics
 - 2 Operations Research
 - 3 Probability and Statistics
 - 4 Scientific Applications
- 3 Pre-College Mathematics Teaching Concentration
- 4 Computational and Applied Mathematics and Statistics, Applied Statistics Track
- 5 Computational and Applied Mathematics and Statistics, Mathematical Biology Track

The Computational and Applied Mathematics and Statistics (CAMS) program is an inter-disciplinary program drawing from the expertise of faculty in Applied Science, Biology, Economics, and Mathematics departments.

<http://www.wm.edu/as/mathematics/undergrad/major/index.php>

<http://www.wm.edu/as/cams/>

Common Requirements for Math Majors

Basic requirement:

- Core courses: Math 111/131, 112/132, 211, 212/213, 214
- Writing Requirement: Math 300 (1 credit), Math 400 (3 credit), **or** Math 495-496 (6 credits)
- Computing Requirement: CS 141 (also CS 241 for Applied Math)
- Math 307 (abstract algebra) and (**or** for Applied Math) Math 311 (elementary analysis)

Course requirement:

- (Standard Math) **three** other three-credit 400 level mathematics courses and **two** other three-credit mathematics course at the 300-400 level, which cannot include both Math 351 and Math 451
- (Applied Math) at least **six** distinct three-credit courses at the 300-400 level with at least five being chosen from the four applied areas listed below and meeting the breadth and depth requirement
- Math 495-496 can substitute one 300-400 level course

<http://www.wm.edu/as/mathematics/undergrad/major/standard/rd-catalog-requirements/index.php>

<http://www.wm.edu/as/mathematics/undergrad/major/appliedmath/rd-catalog-requirements/index.php>

300-400 Math Courses

- Algebra in depth (MATH 307): elective courses chosen from MATH 332, 405, 408, 412, 430, and 432
- Analysis in depth (MATH 311): elective courses chosen from MATH 403, 405, 416, and 428
- Operations Research/Actuarial Science in depth: elective courses chosen from MATH 323, 413, 424, 432 and 451 (and additional courses for 2 other actuarial exams)
- Differential Equations in depth: elective courses chosen from MATH 302, 345, 441, 442
- Computational Mathematics in depth: elective courses chosen from MATH 408, 413, 414, CS 426
- Probability and Statistics in depth: elective courses chosen from MATH 352, 353, 451, 452, 455, 459, ECON 408, CS 616, CS 680
- Scientific Applications in depth: elective courses chosen from MATH 302, 345, 405, 408, 441, 442, PHYS 301

Math major: **DO NOT take MATH 106 or 351**

CAMS major

The Computational and Applied Mathematics and Statistics (CAMS) program is an inter-disciplinary program drawing from the expertise of faculty in Applied Science, Biology, Economics, and Mathematics departments. In CAMS, applications are the primary driver of the research agenda for scholarly activity, with the objective to develop skills in mathematical modeling, data analysis, and computer simulation. Upon completion of the CAMS program, students will be well prepared for a career in mathematics, industry, and the sciences.

CAMS Applied Statistics Track:

Math: Math 111/131, 112/132, 211, 212/213, 214, 451, 452, (two of 352, 424, 459)

CS: CS 141, 241, (three of 301, 303, 421, 426 or 6**)

Econ: Econ 101, 102, 303, (three of 308, 380, 400, 407, 408, 415)

CAMS Mathematical Biology Track:

Math: Math 111/131, 112/132, 211, 212/213, 345(or Biol 325), APSC 351 (or APSC 456), (two of 351, 352, 451, 452, Biol 327)

CS: CS 141, 241, (one of 303, 426, 520, Phys 256)

Biol: any two BIOL 300 level or above courses

more Math: two of APSC 327, 450, Chem 341, 414, Math 302, 413, 414, 441, 442, Phys 403

Columbia Engineering 3+2

William & Mary has a combined degree program with the engineering school at Columbia University. Under the 3:2 and 4:2 plans, a student spends three or four years at William & Mary and two years at the engineering school and receives a bachelor's degree from William & Mary in their primary major as well as a bachelor's degree in engineering from Columbia University.

Requirement:

- At least 3 years in W&M, completion of COLL classes (including COLL 400)
- Minimum overall GPA 3.30 and minimum pre-engineering GPA 3.30, a minimum grade of B (3.0) must be obtained on the first attempt in all science and mathematics prerequisite coursework.
- Courses in Mathematics, Physics, Chemistry, Computer Science, Economics, Writing.

http://physics.wm.edu/~evmik/combined_plan/prerequisites.html

Conclusion

- **Be a Math major!**
- If you want to go to graduate school (PhD level) in Math, Phys, Engineering, Econ/Finance, then choose standard or applied math.
- If you want to go to graduate school (MS level) in Stat, Data Sci, Finance, then choose standard, applied math or CAMS applied stat.
- If you want to go to graduate school (PhD/MS level) in Life Sci, Med Sci, Marine Sci, then choose standard, applied math or CAMS math biol.
- If you will join work force after graduation, then choose any of standard, applied math or CAMS applied stat, CAMS math biol.
- Form: https://www.wm.edu/offices/registrar/documents/degree/declaration_of_major_form.pdf
- Instruction: http://www.wm.edu/as/undergraduate/advising/for_students/exploring-majors/majors/index.php
- I can help you with declaring standard, applied math or CAMS math biol majors.