Mathematics Major Worksheet

Name: _____
Student ID: _____
Advisor: _____
Date: _____

Virginia Commonwealth University™

BS in Mathematical Sciences – Mathematics 2016–17

Note: This worksheet is intended for internal use by the Dept. of Mathematics and Applied Mathematics only. For official degree requirements see the VCU Bulletin.

College of Humanities and Sciences General Education Requirements

Foundational Courses

1 Writing: Complete each course.	Credits	Grade
UNIV 111 Focused Inquiry I		
UNIV 112 Focused Inquiry II (Grade of C or better required.)		
UNIV 200 Inquiry and the Craft of Argument (Grade of C or better required.)		

2. Mathematics & Statistics:		
(fulfilled by major requirements)		

Supporting Courses

3. Human, Social, and Political Behavior: Choose one course.		
ANTH 103 Introduction to Anthropology ECON 101/INTL 102 Introduction to Political Economy HUMS 300 Great Questions of the Social Sciences POLI 103 U.S. Government PSYC 101 Introduction to Psychology (4 credits) SCTS 200 Science in Society: Values, Ethics, and Politics SOCY 101 General Sociology		

4. Science and Technology: Choose one course.		
BIOL 101 Biological Concepts (3 or 4 credits) BIOL/ENVS 103 Environmental Science (4 credits) CHEM 110 Chemistry and Society ENVS 201 Earth System Science FRSC 202 Crime and Science INSC 201 Energy! (Prerequisite: MATH 131, STAT 208 or higher level.) PHYS 103 Elementary Astronomy		

5. Diverse and Global Communities: Choose one course.		
AFAM 111 Intro. Africana INTL 101 Human Societies and Globalization MASC/INTL 151 Global Communication POLI/INTL 105 International Relations RELS 108 Human Spirituality GSWS 201 Introduction to GSWS		
	3	

6. Literature and Civilization: Choose one course.	Credits	Grade
ENGL 215 Textual Analysis HIST 201 The Art of Historical Detection HUMS 250 Reading Film PHIL 201 Critical Thinking About Moral Problems WRLD/INTL 203 Cultural Texts and Contexts WRLD 230 Introduction to World Cinema		
	3	

7. General Education Elective: Choose two courses from boxes 3, 4, 5, or 6 (must be from two different boxes).		

Experiential Courses

8. General Education Modules: Complete each.		
Experiencing the Fine Arts: complete one course from the School of the Arts (1-3 credits).		
HUMS 202 Choices in a Consumer Society	1	

9. Foreign Language: Must demonstrate competency through the 102 level. (Can be met by approved high school background or satisfactory placement test score.)		
101 level		
102 level		

Capstone Course

10. Senior Capstone: Taken in major as a senior (after at least 85 credits).		
MATH 490		

☐ Has VCCS Associate Degree _____
(Such a student needs only to meet the requirements on page 2.)

Mathematical Sciences Major Requirements

The Bachelor of Science degree awarded by the Department of Mathematics and Applied Mathematics requires a minimum of 48 credits in courses labeled MATH, OPER, STAT, or CMSC. Students may choose a concentration in Mathematics, Applied mathematics, Biomathematics or Secondary Mathematics Teacher Preparation. A fifth concentration in General Mathematical Sciences offers flexibility for students who choose not to follow any of the above concentrations. Regardless of concentration, a major must obtain credit for the nine core courses listed in the box below, as well as additional natural science courses, as indicated. Other courses needed to fulfill the requirements of individual concentrations are as follows. A grade of C or better is required in courses marked with an asterisk (*).

Mathematics

MATH 301 Differential Equations*; MATH 401 Introduction to Abstract Algebra; one of MATH 427–429 Excursions in Analysis (Real, Complex, Applied respectively); MATH 409 General Topology; and choose one of MATH 350 Introductory Combinatorics or MATH 356 Graphs and Algorithms. Also, complete 6 additional upper-level credits in mathematics, statistics, operations research or computer science courses, **or** complete a minor or a double major.

Applied Mathematics

MATH 301 Differential Equations*; MATH 415 Numerical Methods; Choose two of MATH 432 Ordinary Differential Equations, MATH 433 Partial Differential Equations, MATH 434 Discrete Dynamical Systems. Also complete 9 additional upper-level credits in mathematics, statistics, operations research or computer science courses, **or** 3 upper-level credits in mathematics, statistics, operations research or computer science and complete a minor or a double major.

Biomathematics

MATH 301 Differential Equations*; MATH 380 Introduction to Mathematical Biology; Choose two of MATH 480-482 Methods of Applied Mathematics for the Life Sciences (Discrete, ODE, PDE respectively). Complete MATH 585 Biomathematics Seminar (repeated for two credits). Also, complete 6 additional upper-level credits in mathematics, statistics, operations research or computer science courses, **or** complete a minor or a double major.

Secondary Mathematics Teacher Preparation

OPER 327 Mathematical Modeling; MATH 404 Algebraic Structures and Functions; MATH 505 Modern Geometry; MATH 430 History of Mathematics; MATH 454 Using Technology in the Teaching of Mathematics. Also, complete 6 additional upper-level credits in mathematics, statistics, operations research, or computer science courses, or complete a minor or a double major which could be in education.

General Mathematical Sciences

Complete MATH 301 Differential Equations* or OPER 327 Mathematical Modeling. Also complete 15 upper-division credits in MATH, STAT or OPER, with at least 9 credits at the 400-500 level, **or** 9 credits in MATH, STAT or OPER at the 400-500 level and complete a minor or double major.

MATHEMATICS CORE (Required for all Mathematical Science majors.)	Semester	Credits	Grade
MATH 200 Calculus with Analytic Geometry I *		4	
STAT 212 Concepts of Statistics		3	
MATH 201 Calculus with Analytic Geometry II *		4	
MATH 255 Intro. to Computational Mathematics **or** EGRE 245 Engineering Programming Using C		3	
MATH 300 Intro. to Mathematical Reason *		3	
MATH 307 Multivariable Calculus *		4	
MATH 310 Linear Algebra *		3	
MATH 490 Mathematical Expositions		3	
MATH 407 Advanced Calculus		3	

CONCENTRATION: (Other required courses in concentration.)	Semester	Credits	Grade

NATURAL SCIENCES: Complete one of the following sequences with lab: PHYS 201–201 or PHYS 207–208 or BIOL 151–152 or CHEM 101–102	Semester	Credits	Grade
Complete another course in the natural sciences. This course must be in a science different from the natural science sequence above, and cannot be from the General Education science and technology list (box 4 on page 1).			

ELECTIVES: (Additional courses to meet the 120 credits needed to graduate.)	Semester	Credits	Grade

Additional degree requirements

- ☐ At least 2.00 cumulative GPA
- ☐ At least 2.00 GPA in major
- ☐ At least 45 credits in upper level (300 or above) courses
- ☐ At least 120 total earned credit hours
- ☐ At least 30 of the last 45 credits from VCU