

Third Rough Draft of B.S. in Mathematics
(intended to be the successor of the Pure Mathematics Concentration)
Friday, June 5, 2009

Departmental requirements presented in the form of a sample program of study:

Term	Courses (hours if not 3)	Total hours	Remarks
Fall 1	Calc I (4)	4	
Spring 1	Calc II (4)	4	
Fall 2	Calc III (4), ODE/Matrix Algebra (4)	8	
Spring 2	linear algebra, intro. to proofs	6	proofs could be a co-req. for linear algebra; proofs could be moved to the previous term
Fall 3	abstract algebra I, elective	6	abstract algebra I and II (and discrete mathematics elective) could be moved to year 4
Spring 3	abstract algebra II, discrete mathematics elective	6	
Fall 4	advanced calculus I, elective, elective	9	adv calc I and II (and analysis elective) could be moved to year 3 <i>with or instead of</i> abstract algebra
Spring 4	advanced calculus II, analysis elective, capstone course	9	
Total		52	Equivalent to 78 qtr. hrs.

Remarks about departmental requirements:

- The named courses are intended to be required. For example, all students in this program would have to take two semesters of advanced calculus (a.k.a. real variables) and an analysis elective, i.e., a course chosen from a specified list of analysis courses to be named later.
- The term *elective* means *departmental elective*, i.e., a course from a specified list of courses to be named later.
- The term in which the various courses are taken could naturally be varied liberally as long as prerequisites are satisfied.
- Whether the capstone course should be among those required is *not clear*. Our committee is not of one mind on that issue.
- This program assumes that the department will offer a single four-semester-hour course combining beginning matrix algebra and beginning ODE, probably with more than half the course devoted to the *latter*. This program would of course have to be amended if no such course is offered, in which case presumably there would a standalone beginning ODE course and a standalone beginning matrix algebra course; or possibly a standalone beginning ODE course and a combination course covering matrix and linear algebra, possibly worth more than 3 semester hours.
- The committee expects that the courses abstract algebra I and II would cover approximately the material now taught in 381, 451, and 452. The order in which those

topics are covered would be of possible significance to departmental curricula that require only abstract algebra I.

- The total departmental requirements are equivalent to 78 quarter hours, 5 more than we now require. Students who have entered WSU before the advent of semesters could not and should not be held to this (purposefully) higher figure.
- The committee expects that calculus II will be the prerequisite for calculus III and also for ODE/Matrix Algebra.

Related course requirements

- One year of calculus-based physics (presumably 10 to 12 semester hours, but we'll find out soon enough from the Department of Physics).
- One semester of an appropriate course taught by the Department of Computer Science (and Computer Engineering), presumably 3 to 4 semester hours. Such a course should teach students to write their own code, familiarizing them with basic programming concepts (loops, data types, subroutines, etc.) and might also use or touch upon high-level "languages" as in Mathematica or Maple or Matlab.

General education requirements

Mathematics and lab science would be covered by the Related Course Requirements above. Otherwise, general education would be according to WSU-wide rules.

Electives

Whatever is left from (presumably) 120 semester hours.

BS in Pure Mathematics, Side by Side Comparison

	Quarters		Semesters	
General Education		66		44
Dept requirements	Calc 3, 4	10	Calc II, III	8
	ODE, LA1	8	ODE/MA	4
	Intro Proof	3	Intro Proof	3
	Linear Alg 2	3	Linear Alg	3
	Reals 1,2,3	9	Reals I,II	6
	Abs Alg 1,2	6	Abs Alg I,II	6
	Capstone	3	???	?
	electives	21	electives	18
Related course req	CS 1,2	8	CS I	3
General electives		46		25

183

120

Remarks

- GE on quarters includes PHY 240/200, 242/202, and 244/204 (16 quarters hours, 4 more than required) and MTH 229-230 (10 quarter hours, 6 more than required).
- GE on semesters includes Calculus I and a year of calculus based Physics, assumed here to add 6 semester hours to the 38 semester hours expected to be generically required in GE.
- If we keep the capstone course as a requirement, it would presumably be worth 3 semester hours and we would presumably reduce the electives to 15 semester hours, leaving the total departmental requirements unchanged.