Mathematics(FSU-teach) – a new Mathematics Major for FSU teaching program

Math Curriculum Committee

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Introduction

Mathematics currently has four undergraduate major codes. Three of these, applied mathematics, biomedical mathematics and pure mathematics, are in the mathematics program. The proposal would add a fifth major option, the mathematics FSU-teach option, and make it the fourth option in the mathematics program. None of these existing options addresses the needs of prospective high school mathematics teachers. Two of the major options are basically geared for preparing the students for graduate school in pure or applied mathematics. The third option is geared for pre-medical undergraduates with its vast collection of science courses. The FSU-Teach plan for mathematics is a more general cross section of mathematics courses that also hits a few notes, like geometry. Their pedagogical training is in a separate secondary major, which is expected to use an additional 23 hours. The new option will have the same Common Prerequisites as the other Mathematical program options and have the same academic map benchmarks as the pure or the applied mathematics options. There are no new courses in this option. The learning outcomes are the same as the learning outcomes for the pure or the applied mathematics options. All the mathematics faculty will participate it teaching these courses as they do now. The next available mathematics major code seems to be 116815. The implementation target date is Fall 2008.

Mathematics Courses

The new teaching option will include a (17 hour) mathematics core of the three calculus courses (MAC 2311-2-3) and linear algebra (MAS 3105). It will include the standard collateral (3 hour) statistics course that all math majors take (STA 4321). The collateral (8 hours) in science courses for majors (BSC XXXX/XXXXL, CHM XXXX/XXXXL, or PHY XXXX/XXXXL). It will also include a collateral required (3 hour) computing course (MAD 3703, COP 3014 or CGS 3406).

Beyond the core, this option requires courses in four mathematical areas of Analysis, Algebra, Geometry and Modeling. Courses acceptable for each are listed below. Also two elective mathematics courses are required (one of the electives must be at the 3000 level or above).

- Algebra (3 hours) MAS 3301, MAS 4302 or MAS 4203
- Analysis (3 hours) MAA 4402, MAA 4224 or MAA 4226
- Geometry (3 hours) MTG 4212
- Modeling (3 hours) MAP 4103, MAP 4175, MAP 4180 or MAP 4481
- Electives (6 hours) MAA4227, MAD 2104, MAD 3105, MAP 2302, MAP 4170, MAP4202, MAP 4216, MAP 4341, MAS 4106, MAS 4303, MGF 3301, MHF 4302, MTG 4302 or additional courses from the Algebra/Analysis/Geometry/Modeling groups.

Course work for FSU-teach

For math this will include 23 hours of course work. It will count as a major and so no addition minor is required. These courses are (mostly, but not entirely) outside Mathematics.

Course List

35	Mathematics (35)	Core (17) + List (18)
38	Statistics (3)	STA 4321
41	Comp Prog (3)	MAD 3703, COP 3014 or CGS 3406
49	Science (8)	8 Hours of Science classes for Science Majors
72	Education (23)	FSU-teach package for Math
84	For Lang (12)	Arts & Sciences Intermediate Level Course
107	Other Liberal Arts (23)	(Math and Science already covered)
107	Total (107)	

Course Number to Course Title

CGS 3406	C++ non CS majors	COP 3014	C++ for CS majors
MAA 4224	Intro to Analysis	MAA 4226	Advanced Calculus I
MAA 4227	Advanced Calculus II	MAA 4402	Complex Variables
MAC 2311	Calculus I	MAC 2312	Calculus II
MAC 2313	Calculus III	MAD 2104	Discrete Math I
MAD 3105	Discrete Math II	MAD 3703	Numerical Analysis I
MAP 2302	ODE	MAP 2480	BioCalculus Lab
MAP 4103	Math Modeling	MAP 4170	Intro to Actuarial Math
MAP 4180	Game Theory	MAP 4202	Optimization
MAP 4216	Calculus of Variations	MAP 4341	Elem PDE I
MAP 4481	Math Model for Bio Math	MAS 3105	Linear Alg I
MAS 3301	Intro Modern Algebra	MAS 4106	Linear Alg II
MAS 4203	Number Theory	MAS 4302	Abstract Algebra I
MAS 4303	Abstract Algebra II	MGF 3301	Intro to Adv Math
MHF 4302	Math Logic	MTG 4212	College Geometry
MTG 4302	Elementary Topology	STA 4321	Intro Math Stat

Mathematics Faculty

Amod Agashe	Ettore Aldrovandi	Paolo Aluffi	Steve Bellenot
Richard Bertram	Anne Blackwelder	Kristina Bowers	Phil Bowers
Bettye Anne Case	Nick Cogan	Kenneth A Dodaro	Gordon Erlebacher
Karen Everage	Brian Ewald	Sergio Fenley	Yevgeny Goncharov
Ishkhan Grigorian	Max Gunzburger	Wolfgang Heil	Eriko Hironaka
Mark van Hoeij	Rudy Horne	Sam Huckaba	Monica Hurdal
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Eric Klassen	David Kopriva	Mary Kutter	Jerry Magnan
Mike Mesterton-Gibbons	Washington Mio	Ziad Musslimani	Mike Navon
Warren Nichols	Craig Nolder	Dan Oberlin	Giray Ökten
Steve Paris	Janet Peterson	Jack Quine	Mika Seppälä
Wilbur Stiles	Mark Sussman	Chris Tam	Raul Tempone
Qi Wang	Xiaoming Wang	Xiaoqiang Wang	James Wooland

Learning Outcomes

- Analytical Skill (Critical Thinking)

  Upon completion of the course of instruction, the student will be able demonstrate a sufficiently high level of analytical skill to construct and critique either a valid mathematical model or a valid proof of a mathematical theorem (whichever is appropriate to the students chosen option).

- Breadth of Knowledge (Content/Discipline Knowledge)

  Upon completion of the course of instruction, the student will be able to demonstrate in-depth knowledge of a broad range of mathematical topics.A

- Laplace Transformation (Content/Discipline Knowledge)

  Upon completion of the course of instruction, the student will be able to apply the Laplace transform to solve an linear ordinary differential equation.

- Eigenvalues and Eigenvectors (Content/Discipline Knowledge)

  Upon completion of the course of instruction, the student will be able to determine the eigenvalues and eigenvectors of a square matrix.

- Multiple Integration (Content/Discipline Knowledge)

  Upon completion of the course of instruction, the student will be able to demonstrate how to evaluate a double integral by interchanging the order of integration.

- Line Integral (Content/Discipline Knowledge)

  Upon completion of the course of instruction, the student will be able to evaluate a line integral.

- Proficiency in a Scientific Programming Language (Content/Discipline Knowledge)

  Upon completion of the course of instruction, the student will be able to demonstrate proficiency in C, C++, Fortran, Java or another approved higher-level programming language.