

# New York University Bulletin



UNDERGRADUATE 2010-2012

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# Mathematics Education

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*Program Director*

## Teaching the Power of Mathematics

Mathematics is a universal tool, applied by scientists, businesspeople, engineers, and others around the world as they tackle the exciting challenges of the 21st century. Mathematics also helps us all with the increasing complexities of daily living—family budgets, insurance and mortgages, tax returns, and investment and retirement funds. With the challenges of the new century both at home and abroad, the demand for outstanding mathematics teachers in our schools has become critical.

## Focus on State-of-the-Art Methods

In the Bachelor of Science Program in Teaching Mathematics, Grades 7-12, in the Department of Teaching and Learning, our goal is to prepare teachers who believe that the best way to help their students learn mathematics is to think critically about their teaching and their students' learning. We focus on current developments in mathematics teaching nationwide and keep the program up-to-date by

integrating into our curriculum recommendations from research, teaching organizations, and national commissions.

We address the issues of ethnicity and gender in mathematics education and work with future teachers to develop strategies to help all students learn worthwhile mathematics.

## Faculty on the Cutting Edge

Our faculty is involved in various projects funded by government agencies and foundations that are designed to assess and devise new teaching methods in mathematics education. Our students often become part of these efforts.

## A Variety of Resources

Students take liberal arts as well as mathematics and computer science courses in the College of Arts and Science. Courses in teaching methods and curriculum development are taken in the Steinhardt School of Culture, Education, and Human Development. Special resources available to students include NYU's internationally renowned

Courant Institute of Mathematical Sciences, the University's numerous microcomputer centers, and the diverse classrooms of New York City as laboratories for learning how to teach in an urban context.

## Teaching Internship

In the junior year, future teachers start their internship preparation as learning partners. Learning partners are assigned to either a middle or high school where they will have the opportunity to observe teachers and work with students as the need and opportunity arise, in order to develop a deeper appreciation of how students learn.

In the senior year, future teachers have two semesters of student teaching in a public school affiliated with our program, under the supervision of experienced mathematics teachers and our own faculty. Recent student teaching placements include Baruch College Campus High School, Beacon High School, East Side Community High School, Fiorello H. LaGuardia High School of Music and Art and Performing Arts, High

School for Dual Language and Asian Studies, Hunter College High School, Manhattan Center for Science and Mathematics, Manhattan Comprehensive Night and Day High School, New Design High School, School of the Future, University Neighborhood High School, Dr. Sun Yat Sen Middle School, Isaac Newton Middle School, Mott Hall II, New York City Lab Middle School for Collaborative Studies, Tompkins Square Middle School, the Laboratory School of Finance

and Technology, and many other middle schools and high schools.

### **Education in Comparative Perspectives**

Future teachers are strongly encouraged to spend a semester abroad in one of NYU's many study abroad sites in Accra, Berlin, Buenos Aires, Florence, London, Madrid, Paris, Prague, Shanghai, or Tel Aviv. NYU in London offers a special course for teacher education students that

takes them to British schools and classrooms for observation and firsthand learning.

### **Student Activities**

Future teachers are required to become student members of the Association of Mathematics Teachers of New York State and the National Council of Teachers of Mathematics. These organizations hold many conferences where students meet current teachers and learn about important issues in class-

room instruction. Students also receive professional newsletters, journals, and other publications that keep them apprised of research and educational issues.

### **Senior Honors**

Qualified seniors who wish to pursue a guided research in an area of educational inquiry may participate in a special yearlong seminar called Honors Research in Teaching and Learning. Working with the faculty instructor, students are guided through the process



of selecting a topic of inquiry, developing research questions, choosing and implementing appropriate methodologies, building outlines, developing bibliographies and writing literature reviews, and preparing drafts. The seminar meets regularly during the first semester as students develop their questions and projects. During the second semester, each student works independently on a project under the direction of his or her own faculty supervisor, with whom the student holds regular meetings. Students meet periodically with their seminar classmates to share their research and findings as they refine and complete their final projects.

### Helping Start Careers in Teaching Mathematics

Our faculty has extensive contacts in the field that lead to information about job openings, and our graduates continually call for recommendations to fill vacancies.

### Other Programs to See:

- Childhood Education and Childhood Special Education
- Early Childhood Education and Early Childhood Special Education
- Science Education

## YOUR CAREER OPPORTUNITIES

Prospects for mathematics teachers in the secondary schools are excellent in the next decade as the demand grows for increased student proficiency in mathematics. Retirement patterns also promise that the demand for mathematics teachers will be even stronger later in the decade.

The Program in Teaching Mathematics prepares future teachers to teach mathematics to students in grades 7 through 12 with an extension down to grade 5. To qualify for initial certification in New York State, future teachers take the New York State Teacher Certification Examinations in basic liberal arts, in basic teaching practices, and in mathematics. After graduating from the B.S. degree program, and while teaching, many of our graduates pursue a master's degree in our 30-point master's degree program that enables them to convert their initial certification into the higher-level professional certification. Some students also take advanced courses or degrees to enable them to become mathematics specialists in a school district, managers of mathematics programs, and assistant principals in charge of mathematics curriculum.

Examples of mathematics teaching positions in New York obtained by our graduates include the following:

- Manhattan Center for Science and Mathematics
- Stuyvesant High School
- Hunter College High School
- School of the Future
- Bard High School Early College
- Hostos-Lincoln Academy for Science
- Humanities Preparatory High School
- Manhattan Comprehensive Night and Day High School
- Baruch College Campus High School

Other graduates have put their mathematics and teaching skills to use in business, industry, science, and government agencies.

## TEACHING MATHEMATICS, GRADES 7-12

The 128-point curriculum in teaching mathematics, grades 7-12, focuses on courses that satisfy requirements in liberal arts, the student's major area of study, and the area of pedagogy.

Students take at least 60 points in liberal arts courses. In mathematics, the major area of study, students take three semesters of calculus, linear algebra, modern algebra, geometry, statistics, and

electives. The pedagogical core educates students in the techniques of teaching mathematics in secondary schools and in understanding the educational development of adolescents. The course of

study incorporates a full range of experiences and observations culminating in two semesters of student teaching in public or independent school settings.

### SAMPLE CURRICULUM WORKSHEET

Freshman Year	33 Points		
<b>FALL SEMESTER</b>  <b>LIBERAL ARTS</b> Foundations of Contemporary Culture: Texts and Ideas. V55.04•• .....4 Writing the Essay. V40.0100 .....4 Natural Science Course by Advisement .....4	<b>MAJOR</b> New Student Seminar. E03.0001 .....0 Field Observations in Schools and Other Educational Settings. E27.0005 .....1 Calculus I. V63.0121 .....4 <b>TOTAL</b> ..... <u>17</u>	<b>SPRING SEMESTER</b>  <b>LIBERAL ARTS</b> Foundations of Contemporary Culture: Cultures and Contexts. V55.05•• .....4 The Advanced College Essay. E52.0110 .....4	<b>MAJOR</b> Inquiries into Teaching and Learning I. E27.0001 .....4 Calculus II. V63.0122 .....4 <b>TOTAL</b> ..... <u>16</u>
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<b>FALL SEMESTER</b>  <b>LIBERAL ARTS</b> Foundations of Contemporary Culture: Societies and the Social Sciences (by Advisement). V55.06•• .....4 Foreign Language .....4 Liberal Arts Elective .....4	<b>MAJOR</b> Calculus III. V63.0123 .....4 <b>TOTAL</b> ..... <u>16</u>	<b>SPRING SEMESTER</b>  <b>LIBERAL ARTS</b> Natural Science Course by Advisement .....4  <b>MAJOR</b> Human Development I. E63.0020 .....2	Human Development II: Application for Educators of Early Adolescents and Adolescents. E63.0023 .....2 Linear Algebra. V63.0140 .....4 Mathematics by Advisement. V63.●●● (such as Advanced Calculus, V63.0325) .....4 <b>TOTAL</b> ..... <u>16</u>
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<b>FALL SEMESTER</b>  <b>LIBERAL ARTS</b> Liberal Arts Elective .....4  <b>MAJOR</b> Language Acquisition and Literacy Education in a Multilingual and Multicultural Context. E27.1030 .....4 Teaching Secondary School Mathematics. E12.1043 .....3	A geometry course such as Transformations and Geometrics. V63.0270  <b>or</b> A probability or probability and statistics course such as Theory of Probability. V63.0233 .....4 <b>TOTAL</b> ..... <u>15</u>	<b>SPRING SEMESTER</b>  <b>MAJOR</b> Education as a Social Institution. E20.1015 .....3 Teaching of Rational Numbers, Grades 5-12. E12.1041 .....3 Mathematics by Advisement. V63.●●● (such as Algebra I, V63.0046) .....4 A geometry course such as Transformations and Geometrics. V63.0270	<b>or</b> A probability or probability and statistics course such as Theory of Probability. V63.0233 .....4 Teaching of Algebra, Grades 7-12. E12.1045  <b>or</b> Teaching of Geometry, Grades 7-12. E12.1046 .....3 <b>TOTAL</b> ..... <u>17</u>

Senior Year		31 Points	
<b>FALL SEMESTER</b>		Mathematics by Advisement .4	<b>SPRING SEMESTER</b>
<b>LIBERAL ARTS</b>		Drug and Alcohol Education/Child Abuse Identification/School Violence Prevention: The Social Responsibilities of Teachers. E81.1999 . . . . .1	Teaching of Algebra (Grades 7-12). E12.1045
Liberal Arts Elective . . . . .4			<b>or</b>
<b>MAJOR</b>			Teaching of Geometry (Grades 7-12). E12.1046 . . . . .3
Student Teaching in Mathematics Education: Middle and High School I. E12.1911 . . . . .7		<b>TOTAL</b> <u>16</u>	Student Teaching in Mathematics Education: Middle and High School II. E12.1922 . . . . .8
			<b>TOTAL</b> <u>15</u>
			<b><u>GRAND TOTAL: 128 Points</u></b>