

# ACCELERATED DUAL DEGREES IN MATHEMATICS, B.S./M.S.

## Accelerated Dual Degrees in Bachelor of Science and Master of Science in Mathematics

Credits: 152  
CIP Code: 270101

### Program Description

The Accelerated Dual Degrees in Bachelor of Science and Master of Science in Mathematics program prepare students to have high levels of proficiency in mathematics content to help them advance to a Ph.D. program in mathematics or mathematics-related fields or to qualify for careers in industry, government, and education.

### Admissions Requirements

Applicants must meet the General Admissions Requirements of Clark Atlanta University as published in the Undergraduate and Graduate Catalogs. At the beginning of the second semester of the third year of study, students in the Bachelor of Science degree in Mathematics may apply for admission to the BS/MS program. The student must have a minimum grade point average of 3.0 and must also satisfy the General Graduate Program Admission requirements. If the student is accepted for the BS/MS program, then he/she may begin graduate course work during his/her fourth year of study while completing the undergraduate BS degree requirements. During the fifth year of study, students engage exclusively in graduate study. Students have the choice of two concentration tracks: Pure Mathematics concentration or Applied Mathematics concentration. Summer research activities may be available or required depending on the student's choice of research area and the availability of the faculty willing to work on the topic.

### Student Learning Outcomes

Upon completion of the Accelerated Dual Degrees in Bachelor of Science and Master of Science in Mathematics Program a student should be able to:

1. Demonstrate a high level of competency in mathematical reasoning and mathematical modeling of complex phenomena in many fields of science.
2. Demonstrate a high level of proficiency in conducting mathematical research and presenting findings, in both written and oral forms, to scientific and general audiences.
3. Demonstrate a high level of competency in constructing proofs of major theoretical results in the field of mathematics.
4. Demonstrate a high level of proficiency in computing skills and mathematical approximations using standard mathematical software and other advanced technologies.

### Degree Requirements

Students in the *Accelerated Dual Degrees in Bachelor of Science and Master of Science in Mathematics* Program should successfully complete all the requirements of the Bachelor of Science degree with a total of 122 credit hours and the Master of Science in Mathematics requirement of 30 credit hours of graduate work. Students have the option of defending an acceptable thesis or completing elective graduate coursework. Elective

courses for the undergraduate degree include Free Electives (6 credit hours) and Minor courses or Electives (18 credit hours).

Students must maintain a minimum cumulative grade point average of 3.0 to continue in the program. At any point during matriculation in this program, students may opt to pursue only the traditional Bachelor of Science Degree in Mathematics.

For *Accelerated Dual Degrees in Bachelor of Science and Master of Science in Mathematics*, students must satisfy the Bachelor of Science of Mathematics requirements plus Graduate requirements:

### Undergraduate Requirements

Code	Title	Hours
<b>Required Mathematics Courses</b>		
CMAT 111	Calculus I	4
CMAT 112	Calculus II	4
CMAT 211	Calculus III	4
CMAT 212	Differential Equations	3
CMAT 214	Linear Algebra	3
CMAT 311	Mathematical Logic	3
CMAT 321	Mathematical Prob & Stat I	3
CMAT 322	Mathematical Prob & Stat II	3
CMAT 325	Modern Algebra	3
CMAT 421	Advanced Calculus I	3
CMAT 422	Advanced Calculus II	3
CMAT 423	Intro to Complex Variables I	3
CMAT 427	Intro to Topology I	3
CMAT 475	Seminar I	3
CMAT 476	Seminar II	3
<b>Mathematics Electives</b>		
Select 12 credits of the following:		12
CMAT 443	Intro to Operations Research	
CMAT 440	Numerical Analysis	
CMAT 471	Discrete Mathematical Structure	
CMAT 106	Pre-Calculus II	
CMAT XXX	Elective (200 level or higher)	
CMAT XXX	Elective (300 or 400 level)	
<b>Total Hours</b>		<b>60</b>

### General Education Courses

Code	Title	Hours
<b>Area A: Humanities/Fine Arts</b>		
Select two of the following:		6
CHIS 201	United States, Africa & World	
CHIS 202	United States, Africa & World	
CHIS 211	History of the United States	
CHIS 212	History of the United States	
CART 150	Art Appreciation	
CHUM 230		
CMUS 119	World Music	
CMUS 120	Music Appreciation	
CSTA 252	Theater Appreciation	
CPHIL 105		
CPHI 221	Introduction to Philosophy	

CPHI 241	Philosophy of Religion
CREL 101	The Biblical Heritage
CREL 103	Afr Amer Religious Experiences
CREL 104	Afr Amer Religious Experience
CREL 250	Comparative Religion

**Area B: Social/Behavioral Sciences**

Select two of the following: 6

CPSC 219	American Govern & Politics
CPSY 211	General Psychology
CPSY 218	Human Growth & Development
CSCJ 215	Intro. to Sociology
CSCJ 216	Intro. to Anthropology
CSCJ 218	Contemporary Social Problems

**Area C: Natural Science/Mathematics/Statistics**

Select two of the following: 8

CBIO 111	General Biology I & Lab
CBIO 112	General Biology II & Lab
CCHE 111	Gen Chem I & Recitation
CCHE 112	Gen Chem II Lec & Recitation
CPHY 121	Physics I: Mechanics
CPHY 122	Physics II: Elec & Magnetism
CPHY 123	Physics III: Optics/Modern Phys

**Area D: Communication**

Select nine credits of the following: 9

CENG 105 & CENG 106	College Composition I and College Composition II
CENG 201	Intro to World Literature I
CENG 202	Intro to World Literature II
CFLX 101	Elementary Foreign Language I
CFLX 102	Elementary Foreign Language II
CFLX 201	Intermediate I
CFLX 202	Intermediate II

**Area E: Financial/Technological**CCIS 105 Programming Principles I  
& 105L and Programming Principles I Lab 4

Select one of the following: 3

CCIS 100	Info. Technology & Comp. App.
CCIS 101	Introduction to Computers
CCIS 253	Intro. to Comp. Sim/Analysis
CCIS 121	Introduction to Computer Sys
CECO 107	Introduction to Economics
CECO 251	Principles of Macroeconomics
CPHI 262	Sci, Tech, & Human Values
CEDC 262	Educational Technology

**Total Hours** 36**University Required Courses**

Code	Title	Hours
CGED 100	First Year Seminar	1
CGED 101	1st-Year Seminar	1
<b>Total Hours</b>		<b>2</b>

**Free Electives: 6 credits**

Any number of courses in Area A, Area B, Area C, Area D, or Mathematics courses which the student has not taken as a required Mathematics elective or general course can be a free elective. Courses that are not listed in areas of A, B, C, D or E may also qualify as a free elective course, but for such courses, the student is required to get the approval of the departmental advisor.

**Minor Electives: 18 Credits**

Electives should be chosen in consultation with the advisor depending on the choice of minor.

**Required Graduate Courses**

Code	Title	Hours
<b>Pure Mathematics Concentration</b>		
CMAT 521	Real Analysis I	3
CMAT 522	Real Analysis II	3
CMAT 523	Complex Variables I	3
CMAT 524	Complex Variables II	3
CMAT 525	Algebra I	3
CMAT 526	Algebra II	3
CMAT 527	Topology I	3
CMAT XXX	Graduate Mathematics Elective	3
CMAT 675	Thesis Seminar I (or CMAT XXX, Graduate Elective)	3
CMAT 676	Thesis Seminar II (or CMAT XXX, Graduate Elective)	3
<b>Total Hours</b>		<b>30</b>

Code	Title	Hours
<b>Applied Mathematics Concentration</b>		
CMAT 521	Real Analysis I	3
CMAT 522	Real Analysis II	3
CMAT 523	Complex Variables I	3
CMAT 524	Complex Variables II	3
CMAT 527	Topology I	3
CMAT 541	Principles of Applied Math I	3
CMAT 542	Principles of Applied Math II	3
CMAT XXX	Graduate Mathematics Elective	3
CMAT 675	Thesis Seminar I (or CMAT XXX, Graduate Elective)	3
CMAT 676	Thesis Seminar II (or CMAT XXX, Graduate Elective)	3
<b>Total Hours</b>		<b>30</b>

**Plan of Study for Accelerated Dual Degree in B.S. and M.S. in Mathematics****Pure Mathematics Concentration**

Course	Title	Hours
<b>First Year</b>		
<b>First Semester</b>		
CENG 105	College Composition I (Area D)	3
CGED 100	First Year Seminar	1

Area A: Humanities/Fine Art (see list)	3
CMAT 106 Pre-Calculus II	3
Area B: Social/Behavioral Sciences (see list)	3
Area E: Financial/technological (see list)	3

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<b>Hours</b>	<b>16</b>
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**Second Semester**

CENG 106 College Composition II (Area D)	3
CGED 101 1st-Year Seminar	1
Area A: Humanities/Fine Arts	3
CMAT 111 Calculus I	4
Free Elective	3
CXXX Minor/ Free Elective	3

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<b>Hours</b>	<b>17</b>
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**Second Year****First Semester**

CMAT 112 Calculus II	4
CMAT 214 Linear Algebra	3
Area C: Natural Science	4
CMAT XXX Math Elective (200 or Higher )	3
CXXX Minor/ Free elective	3

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<b>Hours</b>	<b>17</b>
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**Second Semester**

CMAT 212 Differential Equations	3
CMAT 211 Calculus III	4
CCIS 105 Programming Principles I & 105L and Programming Principles I Lab (Area E)	4
CMAT 311 Mathematical Logic	3
CXXX Minor/ Free Elective	3

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<b>Hours</b>	<b>17</b>
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**Third Year****First Semester**

Area D: Communication	3
CXXX Mino/ Free Elective	3
CMAT 321 Mathematical Prob & Stat I	3
CMAT 325 Modern Algebra	3
CMAT 421 Advanced Calculus I	3

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<b>Hours</b>	<b>15</b>
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**Second Semester**

CMAT 322 Mathematical Prob & Stat II	3
CMAT 422 Advanced Calculus II	3
Area C: Natural Science	4
Area B: Social/Behavioral Sciences (see list)	3
CXXX Minor/ Free Elective	3

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<b>Hours</b>	<b>16</b>
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**Fourth Year****First Semester**

CXXX Minor/ Free Elective	3
CMAT 423 Intro to Complex Variables I	3
CMAT 427 Intro to Toplogy I	3
CMAT 475 Seminar I	3

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<b>Hours</b>	<b>12</b>
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**Second Semester**

Free Elective	3
CMAT XXX Math elective (300 or 400 level)	3
Select one of the following:	3

CMAT 443 Intro to Operations Research	
CMAT 440 Numerical Analysis	
CMAT 471 Discrete Mathematical Structure	
CMAT 476 Seminar II	3

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<b>Hours</b>	<b>12</b>
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**Fifth Year****First Semester**

<b>Fifth Year-Pure Mathematics Concentration</b>		
CMAT 521 Real Analysis I	3	
CMAT 523 Complex Variables I	3	
CMAT 525 Algebra I	3	
CMAT 527 Topology I	3	
CMAT 675 Thesis Seminar I (or Graduate Mathematics Elective (500 or 600 level))	3	

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<b>Hours</b>	<b>15</b>
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**Second Semester**

CMAT 522 Real Analysis II	3
CMAT 524 Complex Variables II	3
CMAT 542 Principles of Applied Math II	3
Mathematics Elective (500 or 600 level)	3
CMAT 676 Thesis Seminar II (or Graduate Mathematics Elective (500 or 600 level))	3

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<b>Hours</b>	<b>15</b>
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<b>Total Hours</b>	<b>152</b>
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**Applied Mathematics Concentration**

Course	Title	Hours
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**First Year****First Semester**

CENG 105 College Composition I (Area D)	3
CGED 100 First Year Seminar	1
Area A: Humanities/Fine Art (see list)	3
CMAT 106 Pre-Calculus II	3
Area B: Social/Behavioral Sciences (see list)	3
Area E: Financial/technological (see list)	3

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<b>Hours</b>	<b>16</b>
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**Second Semester**

CENG 106 College Composition II (Area D)	3
CGED 101 1st-Year Seminar	1
Area A: Humanities/Fine Arts	3
CMAT 111 Calculus I	4
Free Elective	3
CXXX Minor/ Free Elective	3

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<b>Hours</b>	<b>17</b>
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**Second Year****First Semester**

CMAT 112 Calculus II	4
CMAT 214 Linear Algebra	3

Area C: Natural Science	4
CMAT XXX Math Elective (200 or Higher)	3
CXXX Minor/ Free elective	3
<b>Hours</b>	<b>17</b>

**Second Semester**

CMAT 212 Differential Equations	3
CMAT 211 Calculus III	4
CCIS 105 Programming Principles I & 105L and Programming Principles I Lab (Area E)	4
CMAT 311 Mathematical Logic	3
CXXX Minor Elective	3
<b>Hours</b>	<b>17</b>

**Third Year****First Semester**

Area D: Communication	3
CXXX Minor/ Free Elective	3
CMAT 321 Mathematical Prob & Stat I	3
CMAT 325 Modern Algebra	3
CMAT 421 Advanced Calculus I	3
<b>Hours</b>	<b>15</b>

**Second Semester**

CMAT 322 Mathematical Prob & Stat II	3
CMAT 422 Advanced Calculus II	3
Area C: Natural Science	4
Area B: Social/Behavioral Sciences (see list)	3
CXXX Minor/ Free Elective	3
<b>Hours</b>	<b>16</b>

**Fourth Year****First Semester**

CXXX Minor/ Free Elective	3
CMAT 423 Intro to Complex Variables I	3
CMAT 427 Intro to Topology I	3
CMAT 475 Seminar I	3
<b>Hours</b>	<b>12</b>

**Second Semester**

Free Elective	3
CMAT XXX Math elective (300 or 400 level)	3
Select one of the following:	3
CMAT 443 Intro to Operations Research	
CMAT 440 Numerical Analysis	
CMAT 471 Discrete Mathematical Structure	
CMAT 476 Seminar II	3
<b>Hours</b>	<b>12</b>

**Fifth Year****First Semester**

CMAT 521 Real Analysis I	3
CMAT 523 Complex Variables I	3
CMAT 541 Principles of Applied Math I	3
CMAT 527 Topology I	3
CMAT 675 Thesis Seminar I (or Graduate Mathematics Elective (500 or 600 level))	3
<b>Hours</b>	<b>15</b>

**Second Semester**

CMAT 522 Real Analysis II	3
CMAT 524 Complex Variables II	3
CMAT 542 Principles of Applied Math II	3
Mathematics Elective (500 or 600 level)	3
CMAT 676 Thesis Seminar II (or Graduate Elective (500 or 600 level))	3
<b>Hours</b>	<b>15</b>
<b>Total Hours</b>	<b>152</b>