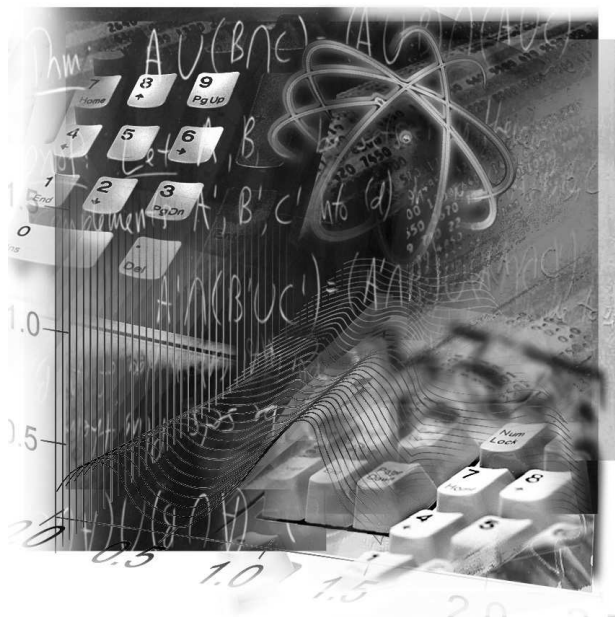


CLARKSON UNIVERSITY



Department of Mathematics

**Student Handbook
(Class of 2014 and beyond)
August 2010**

Student Handbook
Department of Mathematics
Class of 2014 and beyond

August 2010

This handbook has been prepared for advising purposes. It contains detailed requirements and advice for students majoring in either Mathematics or Applied Mathematics & Statistics. A version of this handbook can be found online at the Mathematics Department website at www.clarkson.edu/math.

Note that the [Clarkson Catalog](#), the [Clarkson Regulations](#), and the current edition of [Courses](#) remain the official references.

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Overview of Mathematics Programs

The Department of Mathematics offers two majors:

Mathematics (MA) major: This major is designed for students whose primary interest is mathematics or statistics and is good preparation either for careers in those fields or for graduate study. Students pursuing this major choose one of two options, which differ primarily in the upper-division courses they emphasize:

Math Option: preparation for careers in mathematics or graduate school in mathematics, applied mathematics, or related fields

Statistics Option: preparation for careers as statisticians or actuaries or graduate school in statistics.

Applied Mathematics and Statistics (AM&S) major: This major is designed for students who wish to develop their mathematical skills and apply them to solve challenging problems in science, engineering, or business. This major has less emphasis on abstract mathematics and proof than does the MA major. In addition to a broad base of applied mathematics courses, students choose applications electives in their areas of interest.

Other programs administered by the department:

Major in Digital Arts and Sciences (joint with departments of Communication and Media and Computer Science)
Minor in Mathematics
Minor in Statistics
Minor in Computational Science



General Advice

As you plan your program of study, keep in mind the following considerations and special programs.

Free Electives. Both the MA and AM&S majors include a large number of free electives. You are strongly encouraged to use these electives in a meaningful way. While you can use some of your free electives to take additional courses in your major, many students use some of their free electives to earn either a minor or a second major. This second discipline can be closely related to your major or it can be a discipline in which you have a strong personal or professional interest. Earning a minor or second major has the advantage of appearing on your transcript.

Double Majors. Many students in the department graduate having satisfied the requirements for two different majors. Mathematics and Computer Science is the most common combination; other popular second majors include Physics, Biology, and Business. Doubling with an engineering major usually requires overloading. See your advisor and the Chair of the second department. Sample programs for several double majors are at the back of this booklet. *These are only samples, so you must verify your program with both major departments in advance.*

Dual degrees. A dual degree (the simultaneous awarding of two B.S. degrees) is like a double major, but requires significantly more credit hours and thus is much less common. See the [Catalog](#) and the [Clarkson Regulations](#) for details.

Minors. In recent years, mathematics students have satisfied the requirements for minors spanning 13 different disciplines, from Software Engineering to History to Political Science. See the Catalog for an up-to-date list of available minors. Then see your advisor and the department offering the minor.



Co-ops and Internships. You may spend a semester or more working in a professional capacity for a business. Besides providing valuable experience, participating in this program may pave the way to a job after graduation. Usually the junior year is best for a co-op, but you start planning in the fall of your sophomore year. Contact the Career Center. It's not too early.

Undergraduate research. Many students get involved in research with a faculty member while at Clarkson. For some this gives a change of pace from classroom learning and a taste of what graduate research might be like. For others this becomes a significant part of their education and may culminate in an honors thesis or journal publication. If you're interested, start asking your professors early (e.g., by your sophomore year) to see what they're doing and what your options are. Undergraduate research projects generally earn academic credit (either as Directed Study, Undergraduate Research, or Honors Thesis) and may involve work during the semester or the summer.

Study Abroad Exchange. Clarkson has agreements with universities in England, Australia, Sweden, and others for transfer of credits taken there. This is usually done in the junior year. Contact the Career Center for more information

Cross-Registration. The Associated Colleges of the St. Lawrence Valley (Clarkson, SUNY Potsdam, St. Lawrence, and SUNY Canton) have a cross-registration program for transferring credit. For example, Potsdam State offers courses in foreign languages, fine arts, and education that are not available at Clarkson. You may cross-register for up to two courses per year. Contact your advisor or SAS for details.

Master's degrees. You can complete an MBA degree at Clarkson in one additional year if you choose appropriate electives as an undergraduate. Contact the School of Business Office.



Activities

Association for Women in Mathematics (AWM)

Meetings and events are open to all students, regardless of major or gender. These meetings and activities expose students to the world of professional mathematics, to obtain information about career options in mathematics, to network with professional mathematicians, and to develop leadership skills. The AWM and SIAM function jointly as a Math Club, planning math-related activities for the department, university, and community. Contact Prof. Fowler for information.

Society for Industrial and Applied Mathematics (SIAM)

SIAM is the leading professional society for mathematicians interested in applied and computational mathematics. Clarkson is an institutional member and has a student chapter which works closely with the AWM and PME. All interested students are welcome to join. Contact Prof. Luttman for information.

Pi Mu Epsilon (PME)

Pi Mu Epsilon is the national mathematics honor society. Membership is honorary and based on scholastic achievement; however, most activities are open to all interested students. Contact Prof. Luttman for information.

Mathematical Contest in Modeling (MCM)

Held each spring, the MCM is a contest where teams of undergraduates use mathematical modeling to develop solutions to real-world problems. Contact Prof. Skufca for information.

William Lowell Putnam Mathematical Competition

The “Putnam Exam” is a national competition held each December, testing originality and technical competence. Fame and glory await students who score well. Contact Prof. Felland for information.



General requirements for all Clarkson students:

- Complete at least 120 credit hours
- Achieve at least a 2.0 cumulative GPA overall
- Achieve at least a 2.0 cumulative GPA in the major
- Satisfy the Clarkson Common Experience requirements
- Complete the requirements of at least one major

Specific requirements for all Mathematics (MA) and Applied Mathematics and Statistics (AM&S) majors:

	credit hours
Mathematics (MA) and Statistics (STAT) courses	44
Computer Science (CS141)	4
Physics (PH131 and PH132)	8
Science (PH, CM, or BY course)	3
First-Year Seminar (FY100)	1
The Clarkson Seminar (UNIV190)	3
Knowledge Area Courses	12
University Course	3
Free electives (some restrictions for AM&S)	42
Total:	120

Required MA and STAT courses for MA and AM&S majors:

MA131, MA132, MA200, MA211, MA231, MA232, MA339, MA499, STAT 383, and either MA451 or MA453 and MA431

Additional requirements for MA majors: MA321 and either:

- Math Option: two of MA311, 313, 314, and 322
- Stats Option: all of STAT381, 382, 384, and 488

Additional requirements for AM&S majors:

- MA363 and MA377
- three of MA331, MA332, STAT381, STAT382, STAT384
- additional MA/STAT courses (300 level or above, excluding STAT488, MA497, and MA498) to total 44 credits
- *two COMM courses
- *five application electives from an approved list
- (*these reduce the free electives for AM&S to 21 hours)



Clarkson Common Experience (CCE) requirements:

The courses specified above satisfy most CCE requirements for MA and AM&S majors, including the Professional Requirement (MA451 or MA453) and the Professional Experience (MA499).

The four Knowledge Area Courses and one University Course must be chosen to cover the six Knowledge Areas (CGI, CSO, EC, IA, IG, and STS). In addition, six communication points must be earned, including at least two in courses in the major numbered 300 or higher. Most (or all) of these may be earned in these courses:

two points: MA211, 363, and 377

one point: MA311, 313, 314, 321, 322, and STAT 488

Complete details of CCE requirements can be found in the [Catalog](#) and on the [SAS website](#) under “Master Schedule”.

Notes:

[1] Applications electives for the AM&S major: five three-credit courses from one or more fields of application, chosen from the list which appears at the bottom of the AM&S Sample Program.

[2] The list of courses that constitute the major field is maintained by SAS and shown on the Sample Programs in this booklet.

[3] Up to 12 credit hours of advanced (300- and 400-level) course work in Aerospace Studies or Military Science may count as free electives toward graduation requirements for MA and AM&S majors. AS and MS courses at the 100- and 200-level do **not** count toward graduation requirements.

[4] The following courses do **not** count toward graduation requirements for MA and AM&S majors: MA030, MA031, MA041, MA042, and LA050-051.

[5] The following courses are **not** open to MA or AM&S majors: MA180, MA181, MA239, MA330, SC131, and STAT282.

**MA 499 Professional Experience**

This course records success in completing requirements other than course work for the major in Mathematics or Applied Mathematics and Statistics, and fulfills the Professional Experience requirement of the Clarkson Common Experience. Given Pass/No credit only. Specific requirements (complete one from each category):

1. Demonstrate skill in computer applications by one of the following:
 - a. Complete a course from this list: MA 377, CS 452, EE 468, or other courses as may be specified from time to time.
 - b. Complete a project requiring the effective use of professional level software such as SAS, Matlab, Maple or other software such as that used in the courses mentioned in item a.

2. Demonstrate skill in communication by at least one of the following:
 - a. Serve satisfactorily as tutor or undergraduate recitation leader in a mathematics course for at least one semester.
 - b. Give a presentation at a regional, national or international mathematics meeting.
 - c. Write a paper on a mathematical subject that is accepted for publication in a national or international mathematics, science or engineering journal.
 - d. Participate and give a presentation about his or her work in a mathematics seminar at Clarkson.
 - e. Present for evaluation by the department faculty an acceptable portfolio of writings and/or other communications on mathematical subjects.



3. Demonstrate understanding of the profession by one or more of the following:
 - a. Serve as an active officer in a student chapter of a professional or honorary society.
 - b. Complete an internship or a co-op experience in a professional capacity.
 - c. Participate in an undergraduate research project or a summer research experience for undergraduates.
 - d. Take part in a mathematics or statistics consulting experience.
 - e. Attend a meeting of a mathematics or statistics society.
 - f. Join a professional mathematics or statistics society.

The student must present documentary evidence of satisfying these requirements to the Chair of the Department of Mathematics. Any courses presented to satisfy these requirements may also be counted toward course requirements for graduation.

While students may register for MA499 in either semester of their senior year, planning should start by the junior year at the latest. Satisfaction of the requirements is recorded on a form available from the Mathematics Department office or [website](#) and signed by the Department Chair. Individual requirements may be fulfilled and recorded as soon as they are completed.



Sample Program

First Year			
MA131 Calculus I	3	MA132 Calculus II	3
PH131 Physics I	4	PH132 Physics II	4
CS141 Computer Science I	4	MA200 Math Mod. & Software	3
UNIV 190 Clarkson Seminar	3	Knowledge Area Course	3
FY100 First-Year Seminar	1	Free Elective (CS142 rec.)	3
	15		16
Sophomore Year			
MA211 Foundations	3	MA231 Calculus III	3
MA232 Differential Equations	3	MA339 Applied Linear Algebra	3
Science Elective	3	STAT383 Applied Statistics I	3
Knowledge Area Course	3	Knowledge Area Course	3
Free Elective	3	Free Elective	3
	15		15
Junior Year			
MA321 Advanced Calculus I	3	MA314 or MA322	3
MA311 or MA313	3	MA/STAT Elective	3
KA/University Course	3	KA/University Course	3
Free Elective	3	MA451 or MA453 and MA431	2
Free Elective	3	Free Elective	3
	15		14
Senior Year			
MA/STAT Elective*	3	MA/STAT Elective	3
Free Elective	3	Free Elective	3
Free Elective	3	Free Elective	3
Free Elective	3	Free Elective	3
Free Elective	3	Free Elective	3
MA 499 Professional Exp.	0		
*MA377 recommended	15		15

Major field of study list: All MA/STAT courses MA131 or higher except: MA180, 181, 239, 300-310, 330, 351, 400-432, 497-499, STAT 282, 488.



MATHEMATICS (MATH OPTION)

MA/STAT REQUIRED (44 credits)

COURSE	gr	cr	
MA131	___	<u>3</u>	
MA132	___	<u>3</u>	
MA200	___	<u>3</u>	
MA211	___	<u>3</u>	
MA231	___	<u>3</u>	
MA232	___	<u>3</u>	
MA321	___	<u>3</u>	
MA339	___	<u>3</u>	
STAT383	___	<u>3</u>	
MA___	___	<u>3</u>	(two courses from MA 311,
MA___	___	<u>3</u>	313, 314, 322)
MA451/3	___	—	MA 451 or MA 453
MA499	___	<u>0</u>	Professional Experience
MA___	___	___	(additional credits of MA/STAT to sum to 44)
MA___	___	___	
MA___	___	___	

SCIENCE REQUIREMENT (15 credits)

CS141	___	<u>4</u>	
PH131	___	<u>4</u>	
PH132	___	<u>4</u>	
_____	___	___	(3 credits in PH, CM, or BY)

CLARKSON COMMON EXPERIENCE (19 credits)

FY100	___	<u>1</u>
UNIV190	___	<u>3</u>

Communications Points:

Total of 6 points, at least 2 points in major courses at 300+ level.

University course & four Knowledge Area (KA) courses must cover all six areas.

Course	Pts
_____ (CGI)	1. _____
_____ (CSO)	2. _____
_____ (EC)	3. _____
_____ (IA)	4. _____
_____ (IG)	5. _____
_____ (STS)	6. _____

FREE ELECTIVES (additional credits to sum to 120) .

_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____



Sample Program

First Year			
MA131 Calculus I	3	MA132 Calculus II	3
PH131 Physics I	4	PH132 Physics II	4
CS141 Computer Science I	4	MA200 Math Mod. & Software	3
UNIV 190 Clarkson Seminar	3	Knowledge Area Course	3
FY100 First-Year Seminar	1	Free Elective (CS142 rec.)	3
	15		16
Sophomore Year			
MA211 Foundations	3	MA231 Calculus III	3
MA232 Differential Equations	3	MA339 Applied Linear Algebra	3
Science Elective	3	STAT383 Applied Statistics I	3
Knowledge Area Course	3	Knowledge Area Course	3
Free Elective	3	Free Elective	3
	15		15
Junior Year			
MA321 Advanced Calculus I	3	STAT382 or STAT384	3
STAT381 Probability	3	MA/STAT Elective	3
KA/University Course	3	KA/University Course	3
Free Elective	3	MA451 or MA453 and MA431	2
Free Elective	3	Free Elective	3
	15		14
Senior Year			
STAT488 Statistics Project	1-3	STAT382 or STAT384	3
Free Elective*	3	Free Elective	3
Free Elective	3	Free Elective	3
Free Elective	3	Free Elective	3
Free Elective	3	Free Elective	3
MA 499 Professional Exp.	0		
*MA377 recommended	15		15

Major field of study list: All MA/STAT courses MA131 or higher except: MA180, 181, 239, 300-310, 330, 351, 400-432, 497-499, STAT 282, 488.



MATHEMATICS (STATISTICS OPTION)

MA/STAT REQUIRED (44 credits)

COURSE	gr	cr	
MA131	___	<u>3</u>	
MA132	___	<u>3</u>	
MA200	___	<u>3</u>	
MA211	___	<u>3</u>	
MA231	___	<u>3</u>	
MA232	___	<u>3</u>	
MA321	___	<u>3</u>	
MA339	___	<u>3</u>	
STAT381	___	<u>3</u>	
STAT382	___	<u>3</u>	
STAT383	___	<u>3</u>	
STAT384	___	<u>3</u>	
STAT488	___	___	(1-3 credits)
MA451/3	___	___	MA 451 or MA 453
MA499	___	<u>0</u>	Professional Experience
MA___	___	___	(additional credits of MA/STAT to sum to 44)

SCIENCE REQUIREMENT (15 credits)

CS141	___	<u>4</u>	
PH131	___	<u>4</u>	
PH132	___	<u>4</u>	
_____	___	___	(3 credits in PH, CM, or BY)

CLARKSON COMMON EXPERIENCE (19 credits)

FY100	___	<u>1</u>
UNIV190	___	<u>3</u>

Communications Points:

Total of 6 points, at least 2 points in major courses at 300+ level.

University course & four Knowledge Area (KA) courses must cover all six areas.

Course	Pts
_____ (CGI)	1. _____
_____ (CSO)	2. _____
_____ (EC)	3. _____
_____ (IA)	4. _____
_____ (IG)	5. _____
_____ (STS)	6. _____

FREE ELECTIVES (additional credits to sum to 120)

_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____



Sample Program

First Year			
MA131 Calculus I	3	MA132 Calculus II	3
PH131 Physics I	4	PH132 Physics II	4
CS141 Computer Science I	4	MA200 Math Mod. & Software	3
UNIV 190 Clarkson Seminar	3	Knowledge Area Course	3
FY100 First-Year Seminar	1	Free Elective (CS142 rec.)	3
	15		16
Sophomore Year			
MA211 Foundations	3	MA231 Calculus III	3
MA232 Differential Equations	3	MA339 Applied Linear Algebra	3
Science Elective	3	STAT383 Applied Statistics I	3
Knowledge Area Course	3	Knowledge Area Course	3
Application Elective*	3	Application Elective*	3
	15		15
Junior Year			
MA377 Numerical Methods	3	MA363 Mathematical Modeling	3
MA/STAT Elective (from list)	3	MA/STAT Elective (from list)	3
KA/University Course	3	KA/University Course	3
Application Elective*	3	Application Elective*	3
Free Elective	3	MA451 or MA453 and MA431	2
	15		14
Senior Year			
MA/STAT Elective (from list)	3	MA/STAT Elective	3
COMM Elective	3	COMM Elective	3
Application Elective*	3	Free Elective	3
Free Elective	3	Free Elective	3
Free Elective	3	Free Elective	3
MA 499 Prof. Experience	0		
	15		15

***Application Electives:** At least five three-credit courses from one or more fields of applications chosen from the list: BY314, CE420, 438; CH301, 302, 351, 490; CM314, 371, 372, 440; EC311, 350, 369, 384; EE264; ES220, 222, 223, 250, 260, 330, 340, 400, 405; ME442, 443; OM331; PH221, 231, 322, 325, 331, 380, 381, 432, 451; and other courses as may be specified from time to time.

Major field of study list: All MA/STAT courses MA131 or higher except: MA180, 181, 239, 300-310, 330, 351, 400-432, 497-499, STAT282, 488.



MA/STAT REQUIRED (44 credits)

COURSE	gr	cr	
MA131	___	<u>3</u>	
MA132	___	<u>3</u>	
MA200	___	<u>3</u>	
MA211	___	<u>3</u>	
MA231	___	<u>3</u>	
MA232	___	<u>3</u>	
MA339	___	<u>3</u>	
MA363	___	<u>3</u>	
MA377	___	<u>3</u>	
STAT383	___	<u>3</u>	
_____	___	<u>3</u>	three courses from MA 331, 332,
_____	___	<u>3</u>	STAT 381, 382, 384
_____	___	<u>3</u>	
MA451/3	___	___	
_____	___	___	three-credit MA/STAT courses (300+ level, excluding
_____	___	___	STAT 488, MA 497, MA 498) to total 44 credits
MA499	___	<u>0</u>	Professional Experience

SCIENCE REQUIREMENT (15 credits)

CS 141	___	<u>4</u>	
PH131	___	<u>4</u>	
PH132	___	<u>4</u>	
_____	___	___	(3 credits in PH, CM, or BY)

CLARKSON COMMON EXPERIENCE (19 credits)

FY100	___	<u>1</u>	Communications Points: Total of 6 points, at least 2 points in major courses at 300+ level.
UNIV190	___	<u>3</u>	
University course & four Knowledge Area (KA) courses must cover all six areas.			
			Course Pts

- | | | | | | | |
|-------|-----|-----|-------|----|-------|-----|
| _____ | ___ | ___ | (CGI) | 1. | _____ | ___ |
| _____ | ___ | ___ | (CSO) | 2. | _____ | ___ |
| _____ | ___ | ___ | (EC) | 3. | _____ | ___ |
| _____ | ___ | ___ | (IA) | 4. | _____ | ___ |
| _____ | ___ | ___ | (IG) | 5. | _____ | ___ |
| _____ | ___ | ___ | (STS) | 6. | _____ | ___ |

COMMUNICATION (6 credits) APPLICATION Courses (15 credits min.)

COMM	___	<u>3</u>	_____	___	<u>3</u>	_____	___	<u>3</u>
COMM	___	<u>3</u>	_____	___	<u>3</u>	_____	___	<u>3</u>
			_____	___	<u>3</u>			

FREE ELECTIVES (additional credits to sum to 120)

_____	___	___	_____	___	___	_____	___	___
_____	___	___	_____	___	___	_____	___	___



Suggestions

Mathematics majors who want to focus their studies in a particular area should consider these groupings of courses. These groupings are suggestions from the faculty; they are not requirements. Be sure to check prerequisites before you register for a course.

Actuarial Science. AM&S major or MA major (Statistics Option) together with some of the following:

- MA377 Numerical Methods
- EC150, 151 Principles of Micro, Macro Economics
- EC311 Introduction to Econometrics
- EC465 Economics and Business Forecasting
- FN361 Corporate Finance
- FN462 Investments

Applied Mathematics. MA or AM&S major and some of:

- MA331 Fourier Series and Boundary Value Problems
- MA332 Intermediate Differential Equations
- MA362 Complex Analysis with Applications
- MA363 Mathematical Modeling
- MA377 Numerical Methods
- STAT381 Probability
- CS452 Computer Graphics

Business Applications. AM&S major (or MA major with the Statistics Option) and:

- STAT381 Probability
- EC 150 Principles of Micro Economics
- EC 151 Principles of Macro Economics
- OM 331 Operations/Production Management



EMPHASIS AREAS

Statistics. MA major (Statistics Option) or AM&S major and:

EC311 Introduction to Econometrics
ES405 Design of Experiments
OM485 Quality Systems Management
PY356 Experimental Psychology

Pure Mathematics. MA major (Math Option) and many of:

MA311 Abstract Algebra
MA313 Abstract Linear Algebra
MA314 Number Theory and its Applications
MA322 Advanced Calculus II
MA332 Intermediate Differential Equations
MA362 Complex Analysis with Applications
STAT381 Probability



**Sample Program for Double Major in
Mathematics and Computer Science**

Freshman Year					
Course	Title	Cr.	Course	Title	Cr.
MA131	Calculus I	4	MA132	Calculus II	3
CS141	Computer Science I	3	CS142	Computer Science II	3
PH131	Physics I	4	PH132	Physics II	4
UNIV190	Clarkson Seminar	3	MA200	Math Modeling & Soft.	3
FY100	First Year Seminar	1		Knowledge Area (KA)	3
	TOTAL	15		TOTAL	16
Sophomore Year					
MA211	Foundations	3	MA231	Calculus III	3
MA232	Differential Equations	3	MA339	Applied Linear Algebra	3
CS242	Adv. Prog. Concepts	3	CS241	Computer Organization	3
	University Course	3	CS344	Data Structures	3
	Science Elective	3		Science Elective	3
	TOTAL	15		TOTAL	15
Junior Year					
MA321	Advanced Calculus I	3	STAT383	Applied Statistics I	3
CS341	Programming Lang.	3	CS444	Operating Systems	3
CS345	Automata Theory	3		CS Elective	3
CS350	Software Design/Dev	3		KA Elective	3
	KA Elective	3	MA451/3	Intro. Math Res./Instr.	2
	TOTAL	15		TOTAL	14
Senior Year					
MA311 or MA313	Abstract Algebra or Abstract Lin. Alg.	3	MA322 or MA314	Advanced Calculus II or Number Theory	3
MA377	Numerical Methods*	3		CS Elective	3
	MA/STAT Elective	3		CS Elective	3
	CS Elective	3		KA Elective	3
	CS Elective	3		MA/STAT Elective	3
MA499	Professional Exp.	0	CS499	Professional Exp.	0
	TOTAL	15		TOTAL	15
	*Recommended.			GRAND TOTAL	120



**Sample Program for Double Major in
Applied Mathematics and Statistics and Computer Science**

Freshman Year					
Course	Title	Cr.	Course	Title	Cr.
MA131	Calculus I	4	MA132	Calculus II	3
CS141	Computer Science I	3	CS142	Computer Science II	3
PH131	Physics I	4	PH132	Physics II	4
UNIV190	Clarkson Seminar	3	MA200	Math Modeling & Soft.	3
FY100	First Year Seminar	1		Knowledge Area (KA)	3
	TOTAL	15		TOTAL	16
Sophomore Year					
MA211	Foundations	3	MA231	Calculus III	3
MA232	Differential Equations	3	MA339	Applied Linear Algebra	3
CS242	Adv. Prog. Concepts	3	CS 241	Computer Organization	3
	University Course	3	CS 344	Data Structures	3
	Science Elective	3		Application Elective	3
				KA Elective	3
	TOTAL	15		TOTAL	18
Junior Year					
STAT383	Applied Statistics	3	MA363	Math Modeling	3
CS341	Programming Lang.	3	CS444	Operating Systems	3
CS345	Automata Theory	3		CS Elective	3
CS350	Software Design/Dev	3	MA3xx	MA/STAT Elective	3
	KA Elective	3		Application Elective	3
	Application Elective	3	MA451/3	Intro. Math Res./Instr.	2
	TOTAL	18		TOTAL	17
Senior Year					
MA377	Numerical Methods	3	MA3xx	MA/STAT Elective	3
MA3xx	MA/STAT Elective	3		MA and CS Elective	3
	CS Elective	3		CS Elective	3
	CS Elective	3		COMM and KA Elec.	3
	COMM Elective	3		Application Elective	3
	Application Elective	3	MA499	Prof. Experience	0
	TOTAL	18		TOTAL	15
				GRAND TOTAL	132



**Sample Program for Double Major in
Mathematics and Digital Arts & Sciences**

Freshman Year					
Course	Title	Cr.	Course	Title	Cr.
MA131	Calculus I	3	MA132	Calculus II	3
DA110	Drawing	3	DA100	Intro to Digital Art	3
DA120	Elements of Design	3	CS141	Computer Science I	4
UNIV190	Clarkson Seminar	3	MA200	Math Modeling & Soft.	3
FY100	First Year Seminar	1		Knowledge Area (KA)	3
	TOTAL	13		TOTAL	16
Sophomore Year					
MA211	Foundations	3	MA231	Calculus III	3
MA232	Differential Equations	3	DA3xx	300-level DA course	3
CS142	Computer Science II	3	COMM34	Intro to Web Design	3
DA2xx	200-level DA course	3	1	University Course	3
DA2xx	200-level DA course	3		Free elective	3
	TOTAL	15		TOTAL	15
Junior Year					
MA321	Advanced Calculus	3	MA339	Appl. Linear Algebra	3
MA377	Numerical Methods	3	CS452	Computer Graphics	3
PH131	Physics I	4	PH132	Physics II	4
CS242	Adv. Java Prog.	3		KA course	3
DA491	Professional Practice	3	MA451/3	Intro. Math Res./Instr.	2
	TOTAL	16		TOTAL	15
Senior Year					
STAT383	Applied Statistics	3	DA492	Senior Studies	3
	MA311 or MA313	3		MA314 or MA322	3
	MA/STAT elective	3		MA/STAT elective	3
	Science Elective	3		Free Elective	3
	KA course	3		Free Elective	3
MA499	Professional Exp.	0			
	TOTAL	15		TOTAL	15
				GRAND TOTAL	120



**Sample Program for Double Major in
Mathematics and Physics**

Freshman Year					
Course	Title	Cr.	Course	Title	Cr.
MA131	Calculus I	3	MA132	Calculus II	3
CS141	Computer Science I	4	CS142	Computer Science II	3
PH121	Physics FR Seminar	1	PH132	Physics II	4
PH131	Physics I	4	MA200	Math Modeling & Soft. Knowledge Area (KA)	3
UNIV190	Clarkson Seminar	3			3
FY100	First Year Seminar	1			
	TOTAL	16		TOTAL	16
Sophomore Year					
MA211	Foundations	3	MA231	Calculus III	3
MA232	Differential Eqs.	3	MA339	Applied Linear Algebra	3
PH231/2	Modern Physics	4	PH221	Theoretical Mechanics	3
CM131	Chemistry I	4	CM132	Chemistry II	4
	University Course	3		Free Elective	3
	TOTAL	17		TOTAL	16
Junior Year					
MA321	Advanced Calculus I	3	STAT383	Applied Statistics I	3
STAT381	Probability	3	MA331	Fourier Series	3
PH325	Thermal Physics	3	PH327	Experimental Phys I	3
PH380	Electromag Theory I	3	PH331	Quantum Physics I	3
	Biology Elective	3		KA Elective	3
			MA451/3	Intro. Math Res./Instr.	2
	TOTAL	15		TOTAL	17
Senior Year					
MA311/3	Abs/Linear Algebra	3		MA 314 or MA 322	3
	MA/STAT elective	3		PH elective	3
PH432	Quantum Physics II	3		KA Elective	3
PH435	Senior Seminar	3		COMM Elective	3
	KA elective	3	MA499	Professional Exp.	0
	TOTAL	15		TOTAL	12
				GRAND TOTAL	124

