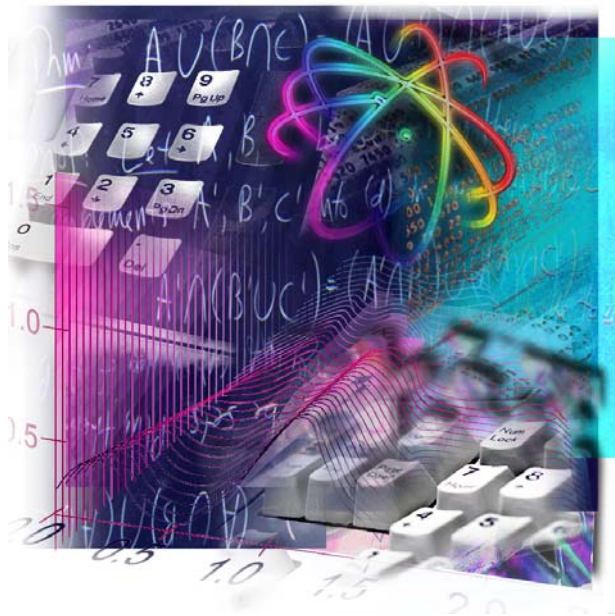


CLARKSON UNIVERSITY



Department of Mathematics

Student Handbook
(Class of 2010 & 2011)
January 2009

Department of Mathematics

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This handbook has been prepared for advising purposes. It contains detailed requirements and advice for students majoring in Mathematics and Applied Mathematics & Statistics.

Note that the Clarkson Catalog (as amended), the Clarkson Regulations and the current edition of Courses remain the official references. As you plan your four years at Clarkson, keep in mind the special programs and general advice listed below.

Co-op Program. 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 Development Center. It's not too early.

Semester Abroad. Clarkson has agreements with universities in England, Australia, Sweden, and others for transfer of credits taken there. Usually done in the junior year. Contact the Career Development Center.

Cross Registration. The four local colleges 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. Contact your advisor or SAS.

Double Major. In the last two years, 30% of Department students graduated having satisfied the requirements for two different majors. Mathematics and Computer Science was the most common. Also common was Math and Physics. Doubling with an engineering major usually requires overloading. See your advisor and the Chair of the second department. Sample requirements for several double majors are at the back of this booklet. *These are only sample schedules so you should verify your program with both of your major departments in advance.*



Master's degrees. You can complete an MBA or MS in Management Systems at Clarkson in one additional year if you choose appropriate electives as an undergraduate. Visit the School of Business Graduate Office for details.

Free Electives. All Department programs include a fairly large number of free electives. You are strongly encouraged to use these electives in a meaningful way. You can use some of your free electives to take additional courses in your major. However, in the last two years, 70% of Department graduates used some of their free electives to earn either a minor or a second major. You are encouraged to follow their example; the knowledge and perspective gained through the study of a second discipline is invaluable. 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 being recognized on your transcript.

Minors. The flexibility of the Department's programs makes it easy to add a minor to your major program of study. In the last two years, Department students satisfied the requirements for minors spanning 13 different disciplines, from Software Engineering and Digitally Mediated Communication to History and Political Science. See the Catalog for an up-to-date list of available minors. Then see your advisor and/or the department offering the minor.

Sample Minors

Computational Science

Computer Science

Communications

Physics

Psychology

An application and sample requirements are at the back of this booklet.



- [1] Complete at least 120 credit hours and have a 2.0 cumulative average.
- [2] Students must achieve a cumulative QPA of at least 2.0 in the major field of study. The list of courses that constitute the major field is maintained by SAS. This list is also shown at the bottom of Sample Programs in this booklet.
- [3] All students must satisfy the requirements of the Clarkson Common Experience (CCE). The CCE requirements can be found in the Clarkson Catalog and on-line at http://www.clarkson.edu/common_experience
- [4] FY 100: First-Year Seminar is **required** for all students entering as Freshmen.
- [5] Applied Math & Statistics majors must take at least 2 COMM courses.
- [6] 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 in Mathematics. (100- and 200-level AS and MS courses do **not** count toward graduation requirements.)
- [7] Some of the program requirements are electives that must be chosen from specified lists of courses. Some of these lists are reviewed and updated periodically. Check with your advisor or with the Division office for the most up-to-date list.

Restrictions:

- [1] The following courses do **not** count towards graduation requirements: MA031, 041, 042.
- [2] The following courses are **not** open to Mathematics Majors: 180, 181, 239, SC131 and STAT282.
- [3] LA 050-051 do **not** count toward graduation requirements.

**Sample Program**

First Year			
MA131 Calc I	3	MA132 Calc II	3
CS141 Intro to CS I	4	CS142 Intro to CS II (rec'd)	3
PH131 Physics I	4	PH132 Physics II	4
UNIV 190 Clarkson Seminar	3	MA200 Math Modeling & Software	3
FY100 First-Year Seminar	1	Knowledge Area Course	3
	15		16
Sophomore Year			
MA211 Foundations	3	MA231 Calculus III	3
MA232 Diff Equations	3	MA339 Appl Linear Alg	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
MA3xx Math & Stat Elective	3	MA/STAT Elective	3
KA/University Course	3	MA3xx Math & Stat Elective	3
Application elective	3	KA/University Course	3
Free Elective	3	Application Elective	3
	15		15
Senior Year			
MA451/453 Math Res. or Inst.	1-3	MA/STAT Elective	3
MA/STAT Elective	3	MA/CS Elective	3
COMM Elective	3	COMM Elective	3
Application Elective	3	Free Elective	3
Free Elective	3	Free Elective	3
MA 499 Prof. Experience	0		
	14		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. **Math & Stat Electives:** at least four courses from MA 331, 332, 377, 381, 382, 384; and at least two more 3-credit MA courses at 300+ level. *Major field of study list:* All MA courses MA 131 or higher except: MA 239, 300-310, 351, 400-432, 497-499, STAT 282, 488.



MA/CS REQUIRED (48 credits)

COURSE	gr	cr	
MA131	___	<u>3</u>	
MA132	___	<u>3</u>	
CS 141	___	4	
MA200	___	<u>3</u>	(recommended)
MA211	___	<u>3</u>	
MA231	___	<u>3</u>	
MA232	___	<u>3</u>	
MA339	___	<u>3</u>	
MA363	___	<u>3</u>	
STAT383	___	<u>3</u>	
MA___	___	<u>3</u>	(four courses from MA 331,
MA___	___	<u>3</u>	332, 377, STAT 381, 382, 384)
MA___	___	<u>3</u>	
MA___	___	<u>3</u>	
MA___	___	<u>3</u>	(MA/STAT two three-credit courses at 300 level or above
_____	___	<u>3</u>	excluding: STAT 488, MA 497, or MA 498)
MA 451/3	___	___	MA 451 or MA 453
MA499	___	___	Professional Requirements

SCIENCE REQUIREMENT (11 credits minimum)

PH131	___	4	
PH132	___	4	
_____	___	___	(3 credits in PH, CM, BY or Science Foundation courses)

CLARKSON COMMON EXPERIENCE (19 credits)

FY100	___	<u>1</u>		Communications Points:
UNIV190	___	<u>3</u>		Total of 6 points, at least 2 points in
University course & four knowledge				major courses at 300+ level.
area (KA) courses must cover all six areas.				
			Crs.	Pts
_____	___	___	(CGI)	1. _____
_____	___	___	(CSO)	2. _____
_____	___	___	(EC)	3. _____
_____	___	___	(IA)	4. _____
_____	___	___	(IG)	5. _____
_____	___	___	(STS)	6. _____

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

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

FREE ELECTIVES (additional credits to sum to 120) . See page 5 for restrictions.

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



MA 499, Professional Requirements

This course records success in completing requirements other than course work for the major in Applied Mathematics and Statistics. Given Pass/No credit only. Specific requirements:

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. Make 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 make a presentation 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 Science.
- 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 Chairman of the Department of Mathematics . Any courses presented to satisfy these requirements may also be counted toward course requirements for graduation.

Suggestions

Below are some groups of courses that focus on a particular area of Applied Mathematics and Statistics. These groupings are suggestions from the faculty; they are not requirements. Be sure to check prerequisites before you register for a course.

Actuarial Science Students should consider these additional courses (Sample program available, see Prof. Felland)

- MA377 Numerical Methods
- EC150, 151 Principles of Micro, Macro Economics
- EC369 Introduction to Econometrics
- EC465 Economics and Business Forecasting
- FN361 Corporate Finance
- FN462 Investments

Statistics Students should consider these additional courses (See Prof. Alhakim)

- EC369 Introduction to Econometrics
- ES405 Design of Experiments
- OM485 Quality Systems Management
- PY356 Experimental Psychology

**Sample Program**

First Year			
MA131 Calc I	3	MA132 Calc II	3
CS141 Intro to CS I	4	CS142 Intro to CS II (rec'd)	3
PH131 Physics I	4	PH132 Physics II	4
UNIV 190 Clarkson Seminar	3	MA200 Math Modeling & Software	3
FY100 First-Year Seminar	1	Knowledge Area Course	3
	15		16
Sophomore Year			
MA211 Foundations	3	MA231 Calculus III	3
MA232 Diff 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 Adv. Calculus I	3	MA/CS elective	3
MA311 or MA313	3	MA322 or MA314	3
KA/University Course	3	KA/University Course	3
Free elective	3	Free elective	3
Free Elective	3	Free Elective	3
	15		15
Senior Year			
MA451/453 Math Res. or Inst.	1-3	MA/CS Elective	3
MA377 Numerical Methods	3	MA/CS Elective	3
Free Elective	3	Free Elective	3
Free Elective	3	Free Elective	3
Free Elective	3	Free Elective	3
MA 499 Professional Req.	0		
	14		15

Major field of study list: All MA courses MA 131 or higher except: MA 239, 300-310, 351, 400-432, 497-499, STAT 282, 488.



MATHEMATICS (MATH OPTION)

MA/CS REQUIRED (48 credits)

COURSE	gr	cr	
MA131	___	<u>3</u>	
MA132	___	<u>3</u>	
CS 141	___	<u>4</u>	
MA200	___	<u>3</u>	(recommended)
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)
MA 451/3	___	___	MA 451 or MA 453
MA499	___	___	Professional Requirements
MA___	___	___	(additional credits of MA/CS/STAT to sum to 48)
MA___	___	___	
MA___	___	___	

SCIENCE REQUIREMENT (11 credits minimum)

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

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.		Crs.	Pts
_____	___	___	___
_____	___	___	___
_____	___	___	___
_____	___	___	___
_____	___	___	___
_____	___	___	___

FREE ELECTIVES (additional credits to sum to 120) . See page 5 for restrictions.

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



Sample Program

First Year			
MA131 Calc I	3	MA132 Calc II	3
CS141 Intro to CS I	4	CS142 Intro to CS II (rec'd)	3
PH131 Physics I	4	PH132 Physics II	4
UNIV 190 Clarkson Seminar	3	MA200 Math Modeling & Software	3
FY100 First-Year Seminar	1	Knowledge Area Course	3
	15		16
Sophomore Year			
MA211 Foundations	3	MA231 Calculus III	3
MA232 Diff Equations	3	MA339 Appl Linear Alg	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 Adv. Calculus I	3	MA/CS elective	3
MA381 Probability	3	STAT382 or STAT384	3
KA/University Course	3	KA/University Course	3
Free elective	3	Free elective	3
Free Elective	3	Free Elective	3
	15		15
Senior Year			
MA451/453 Math Res. or Inst.	1 - 3	MA/CS elective	3
MA377 Numerical Methods	3	STAT382 or STAT384	3
STAT488 Statistics Project	1 - 3	Free Elective	3
Free Elective	3	Free Elective	3
Free Elective	3	Free Elective	3
MA 499 Professional Req.	0		
	14		15

Major field of study list: All MA courses MA 131 or higher except: MA 239, 282, 300-310, 351, 400-432, 488, 497-499.



MATHEMATICS (STATISTICS OPTION)

MA/CS REQUIRED (48 credits)

COURSE	gr	cr	
MA131	___	<u>3</u>	
MA132	___	<u>3</u>	
CS 141	___	<u>4</u>	
MA200	___	<u>3</u>	(recommended)
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)
MA 451/3	___	___	MA 451 or MA 453
MA499	___	___	Professional Requirements
MA___	___	___	(additional credits of MA/CS/STAT to sum to 48)

SCIENCE REQUIREMENT (11 credits minimum)

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

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

FREE ELECTIVES (additional credits to sum to 120) . See page 5 for restrictions.

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



Suggestions

Mathematics majors who want to focus their studies in a particular area should consider these groupings of courses. The following are suggestions, not requirements:

Actuarial Science Students should take the Statistics Option and consider these additional courses (Sample program available, see Prof. Felland)

- 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

- 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

- MA381 Probability
- EC 150 Principles of Micro Economics
- EC 151 Principles of Macro Economics
- OM 331 Operations/Production Management

Statistics Students should take the Statistics Option and consider these additional courses (See Prof. Alhakim)

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

**Pure Mathematics**

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
STATA381 Probability

Activities**Modeling Contest**

Interested in solving real world problems in a team environment? We are currently looking for students to compete in the International Mathematical Contest in Modeling (MCM). See <http://www.comap.com/undergraduate/contests/> for more details or contact Prof. Fowler at kfowler@clarkson.edu. Look for flyers posted around campus soon!

Pi Mu Epsilon

Pi Mu Epsilon is a national mathematics honor society. Membership is honorary, based on scholastic achievement; however, most activities are open to all interested students and faculty. Contact Prof. Fulton (fulton@clarkson.edu) for information.

AWM

The Association for Women in Mathematics. 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 the varied career options in mathematics, to network with professional mathematicians, and to develop leadership skills. In addition we plan math related activities for the department, university, and community. Contact Prof. Fowler if you are interested in joining or tutoring (kfowler@clarkson.edu).



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

Freshman Year					
Course	Title	Cr.Hrs	Course	Title	Cr.Hrs
MA131	Calculus I	4	MA132	Calculus II	3
CS 141	Computer Science I	3	CS 142	Computer Science II	3
PH 131	Physics I	4	PH 132	Physics II	4
UNIV 190	Clarkson Seminar	3	MA200	Math Modeling & Soft. Knowledge Area (KA)	3
FY 100	First Year Seminar	1			
	TOTAL	15		TOTAL	16
Sophomore Year					
MA211	Foundations	3	MA231	Calculus III	3
MA232	Differential Equations	3	MA339	Applied Linear Algebra	3
CS 242	Adv. Prog. Concepts	3	CS 241	Computer Organization	3
	University Course	3	CS 344	Data Structures	3
	Science Elective	3		Science Elective	3
	TOTAL	15		TOTAL	15
Junior Year					
MA321	Advanced Calculus I	3	STAT	Applied Statistics I	3
CS 341	Programming Lang.	3	383		
CS 345	Automata Theory	3	CS 444	Operating Systems	3
CS350	Software Design/Dev	3		CS Elective	3
	KA Elective	3		KA Elective	3
	TOTAL	15		Free Elective	3
				TOTAL	15
Senior Year					
MA311 /313	Abstract Algebra or Linear Algebra	3	MA322 /314	Advanced Calculus II or Number Theory	3
MA377	Numerical Methods*	3		CS Elective	3
MA451	MA451 or 453	1-3		CS Elective	3
MA499	Professional Exp.	0		KA Elective	3
	CS Elective	3		Free Elective	3
	CS Elective	3		TOTAL	15
	TOTAL	14-15			
	*Recommended.			GRAND TOTAL	120



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

Freshman Year					
Course	Title	Cr.Hrs	Course	Title	Cr.Hrs
MA131	Calculus I	4	MA132	Calculus II	3
CS 141	Computer Science I	3	CS 142	Computer Science II	3
PH 131	Physics I	4	PH 132	Physics II	4
UNIV 190	Clarkson Seminar	3	MA200	Math Modeling & Soft. Application Elective	3 3
FY 100	First Year Seminar	1			
	TOTAL	15		TOTAL	16
Sophomore Year					
MA211	Foundations	3	MA231	Calculus III	3
MA232	Differential Equations	3	MA339	Applied Linear Algebra	3
CS 242	Adv. Prog. Concepts	3	CS 241	Computer Organization	3
	University Course	3	CS 344	Data Structures	3
	Science Elective	3		Application Elective	3
	TOTAL	15		TOTAL	15
Junior Year					
STAT 383	Applied Statistics	3	MA363	Math Modeling	3
CS 341	Programming Lang.	3	CS 444	Operating Systems	3
CS 345	Automata Theory	3		CS Elective	3
	CS Elective	3		KA Elective	3
	KA Elective	3		COMM Elective	3
	Application Elective	3		Application Elective	3
	TOTAL	18		TOTAL	18
Senior Year					
MA3xx	Math/Stat Elective	3	MA 3xx	Math/Stat Elective	3
MA377	Numerical Methods	3	MA 3xx	Math/Stat Elective	3
MA451	MA 451 or 453	1-3		CS Elective	6
	CS Elective	3		KA Elective	3
	COMM Elective	3		Appl. Elective	3
	Appl. Elective	3	MA 499	Prof. Experience	0
	TOTAL	17		TOTAL	18
				GRAND TOTAL	131



**Sample Schedule for Double Major in
Mathematics and Digital Arts & Science**

Freshman Year					
Course	Title	Cr.Hrs	Course	Title	Cr.Hrs
CS 141	Computer Science I	4	CS 142	Computer Science II	3
MA131	Calculus I	3	MA132	Calculus II	3
DA 110	Painting and Drawing	3	DA100	Digital Studio I	3
UNIV 190	Clarkson Seminar	3	MA200	Math Modeling & Soft. Knowledge Area (KA)	3
FY 100	First Year Seminar	1			
	TOTAL	14		TOTAL	15
Sophomore Year					
CS 242	Adv. Prog. Concepts	3	MA231	Calculus III	3
PH 131	Physics I	4	COMM 321	Digital Imagery	3
COMM 310	Mass Media & Soc.	3	COMM 341	Intro to Web Design	3
MA232	Differential Eqs.	3	PH 132	Physics II	4
FILM 344	Hist Art Film Anima.	3	DA 200	Digital Studio II	3
	TOTAL	16		TOTAL	16
Junior Year					
MA377	Numerical Methods	3	MA 339	Appl Linear Algebra	3
COMM 327	Digital Video I	3	COMM 427	Digital Video II	3
MA211	Foundations	3	CS 452	Computer Graphics	3
PH 323	Optics (or Sci. Elect)	3/1	DA 300	Digital Studio III	3
DA491	DA&S Portfolio Dev.	2	STAT 383	Applied Statistics	3
	TOTAL	17		TOTAL	15
Senior Year					
COMM 345	Info Architecture	3	DA 492	DA&S Portfolio	3
MA321	Advanced Calculus I	3	MA322	MA 322 or MA 314	3
MA311	or MA 313	3	MA451	MA451 or 453	1-3
MA499	Professional Exp.	0		COMM Elective	3
	KA Elective	3		KA Elective	3
	University Course	3		TOTAL	14-15
	TOTAL	15			
				GRAND TOTAL	123



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

Freshman Year					
Course	Title	Cr.Hrs	Course	Title	Cr.Hrs
CS 141	Computer Science I	4	CS 142	Computer Science II	3
MA131	Calculus I	3	MA132	Calculus II	3
PH121	Physics FR Seminar	1	PH 132	Physics II	4
PH 131	Physics I	4	MA200	Math Modeling & Soft.	3
UNIV 190	Clarkson Seminar	3		Knowledge Area (KA)	3
FY 100	First Year Seminar	1		TOTAL	16
	TOTAL	16			
Sophomore Year					
CM131	Chemistry I	4	MA231	Calculus III	3
MA211	Foundations	3	MA339	Applied Linear Algebra	3
MA232	Differential Eqs.	3	PH 221	Theoretical Mechanics	3
PH231/2	Modern Physics	4	CM 132	Chemistry II	4
	University Course	3		COMM Elective	3
	TOTAL	17		TOTAL	16
Junior Year					
MA321	Advanced Calculus I	3	STAT	Applied Statistics I	3
MA377	Numerical Methods	3	383		
PH 325	Thermal Physics	3	MA 331	Fourier Series	3
PH 380	Electromag Thy I	3	PH 327	Experimental Phys I	3
	Biology Elective	3	PH 331	Quantum Physics I	3
	TOTAL	15		KA Elective	3
				TOTAL	15
Senior Year					
MA311/3	Abstr Algebra/Linear	3	MA	MA 314 or MA 322	3
PH 432	Quantum Physics II	3	MA 377	Numerical Methods	3
PH 435	Senior Seminar	3	PH 381	Electromag Thy II	3
MA 451/ 453	Math Res. or Inst.	3		KA Elective	3
MA451	MA 451 or 453	1-3		COMM Elective	3
MA499	Professional Exp.	0		TOTAL	15
	TOTAL	15			
				GRAND TOTAL	123



Sample Minors

Examples of basic requirements for a minor are:

For complete requirements —contact department offering the minor (plus all university requirements for a minor must be met).

Computational Science Minor

MA277 Introduction to Computational Science*
MA377 Numerical Methods

At least two of

MA232 Differential Equations
MA239/339 Elementary/Applied Linear Algebra
MA282/383 General/Applied Statistics

Application area electives to make a total of 21 credits.

* MA277 may not be taken after, or concurrent with, MA377. Successful completion of MA377 implies satisfaction of this requirement for the minor in CSE.

Computer Science Minor

Core courses

CS141 Introduction to Computer Science I
CS142 Introduction to Computer Science II
MA211 Foundations
CS344 Algorithms and Data Structures

Electives

Three additional CS courses, one numbered 200 or higher, one numbered 300 or higher, and one numbered 400 or higher. Each course must be worth at least three credits.

Information Technology

two courses in problem solving and programming:

CS141 *or* EE261, **and** CS142 *or* EE361

one course in computer systems

CS241 *or* EE360

one course in database administration

IS314

one course in computer networks

CS 454 *or* CS 455/EE407

Two courses concerned with web technologies and administration:

COMM 442 **and** COMM 444.

Contact department offering the Minor for a complete list of requirements for the minor you are interested in!

Undergraduate Declared Minor Form

Date Initiated _____

1. Student Name _____ Student Number _____

Local Box _____ Local Phone _____

Class Year _____ Musician's Name _____

In addition to my major in _____ and second major (if applicable) in _____
I request that I be registered for a minor in _____

I UNDERSTAND THAT the University has no responsibility to offer or schedule courses in order to assure the achievement of the minor. If I decide to drop my minor, I will inform Student Administrative Services in writing. Further, I understand that all requirements for completion of the minor must be complete at the time of graduation from Clarkson University in order to be a registered part of my degree program.

Student: _____ Date: _____
Signature

2. Approvals

Approval: _____ Date: _____
Chair/Director, 1st Named Major

1st Major Advisor's Name: _____

Approval: _____ Date: _____
Chair/Director, 2nd Named Major

2nd Major Advisor's Name: _____

Approved: _____ Date: _____
Chair/Director, Minor Department

Distribution: Chair/Director, 1st Major
Chair/Director, 2nd Major
Chair/Director, Minor

Jan 09

