

Community College System of New Hampshire

MATHEMATICS REQUIREMENTS

ADVISORS HANDBOOK





Community College System of New Hampshire

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Dear Colleague:

I am pleased to be able to share with you the first ever *CCSNH: Mathematics Requirements – Advisors Handbook*. The information included in this report has two primary intended purposes:

- ◆ To provide, in one source, a clear and concise description of mathematics requirements for all associate degree programs at each of the seven community colleges; and
- ◆ To provide information to make the case to students and parents of the importance of staying engaged in mathematics education throughout all four years of high school.

Research has shown that there are few better predictors of a student's potential success in college than participation in math instruction throughout the secondary school experience. Research has also shown that, along with course content, when students take math courses is vitally important to performance in both careers and postsecondary education. In particular, the research emphasizes the criticality of taking math in the junior and senior year.

I want to acknowledge the CCSNH MaTHSC Steering Committee members whose important work on the subject of math preparedness and the transition from high school to college led to the development of this reference guide.

I am hopeful that the *Advisors Handbook* will prove to be a valuable resource for academic planning with your students. My best wishes to you as you continue the important work of guiding the decision-making processes of your advisees.

Sincerely,

A handwritten signature in black ink, appearing to read 'Richard A. Gustafson'.

Dr. Richard A. Gustafson
 Chancellor
 Community College System of New Hampshire

Acknowledgement and Disclaimer

The *Advisors Guide* is the product of research conducted by Community College System of New Hampshire, in partnership with the New Hampshire Impact Center at Plymouth State University, and funded by the New Hampshire Department of Education as part of the *Making the Transition from High School to College (MaTHSC) Grant*.

The following individuals served as members of the CCSNH Steering Committee during the twenty months of this project.

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Link to Additional Materials of Interest:

Website: <http://www.plymouth.edu/graduate/nhimpact/news.htm>

Disclaimer: Every effort has been made to assure the accuracy of the information included in this Handbook at the time of printing. Policies and procedures change over time and advisors and students should rely on current campus catalogs and websites in finalizing their enrollment planning.

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Math Requirements Statement Recently Approved by the Presidents of the New Hampshire Community Colleges

Every degree student must demonstrate basic arithmetic and algebra skills before enrolling in college-level math and other courses (e.g., science). To earn an associate degree, students will be required to complete successfully one or more college-level math classes specified by the particular program and curriculum to which the student has been accepted. Students lacking basic arithmetic and algebra skills may achieve those competencies through developmental math courses offered at the college.

Prerequisite CCSNH Math Competencies

If an entering student demonstrates mastery of the fourteen algebraic skills described below, they will be prepared to both pass the math placement exams administered at time of entrance, and to successfully enroll in a college-level math course for degree credit. Please consider the need to master these competencies in your academic planning/advising for students intending to enter one of New Hampshire's Community Colleges.

- **Perform operations with signed numbers**
- **Simplify algebraic expressions**
- **Solve and graph linear equations and linear inequalities**
- **Solve formulas for specific variables**
- **Apply the rules of exponents**
- **Evaluate numerical square roots**
- **Translate and solve word problems**
- **Graph linear equalities in two variables**
- **Find the slope of a line**
- **Simplify polynomials**
- **Factor polynomials**
- **Solve systems of linear equations in two variables**
- **Simplify rational expressions**
- **Solve quadratic equations by factoring**

Mathematics Requirements by Academic Major

The following matrices identify the mathematics requirements, by major and campus, for all Associate Degree programs at the seven New Hampshire Community Colleges.

For advising purposes, these matrices provide a valuable tool for informing high school students of the importance of staying engaged with math instruction through the junior and senior year. Please emphasize that *all* degree programs at the Community Colleges, require at least one college-level math course for completion.

NHCTC - Berlin Mathematics Requirements by Program

	MAT112 Algebra and Trigonometry I	LMAT170 College Algebra	MAT211 Algebra and Trigonometry II	MAT212 College Mathematics	MAT214 Statistics	MAT215 Calculus I	MAT220 Math In Our World	MAT225 Finite Mathematics
Accounting				X				
Applied Engineering Technology	X		X					
Automotive Service Management	X							
Automotive Technology	X							
Business Administration				X	X			
Criminal Justice				X				
Culinary Arts				X				
Early Childhood Education				X				
Environmental Science	X				X			
Forest Information Technology	X		X		X			
General Studies*								
Geographic Information Systems	X		X		X			
Human Services				X				
Information Technology	X		X					
Liberal Arts**								
Mobile Equipment Technology	X							
Nursing				X	X			
Office Management				X				
Surveying Technology	X		X		X			
Teacher Preparation					X		X	

*One 3-4 Credit Math Course to be selected with help of advisor

**Two 3-4 Credit Math Courses to be selected with help of advisor

NHCTC - Claremont Mathematics Requirements by Program

	<i>MTHC106 Statistics</i>	<i>MTHC110 Algebra and Trigonometry</i>	<i>MTHC115 Finite Mathematics</i>	<i>MTHC120 Pre-Calculus</i>	<i>MTHC210 Calculus I</i>	<i>MTHC211 Calculus II</i>	<i>MTHC212 Multivariate Calculus</i>	<i>MTHC215 Linear Algebra</i>	<i>MTHC116 Math Language, Logic and Proof</i>	<i>MTHC217 Probability and Statistics</i>	<i>MTHC220 Elementary Differential Equations</i>
Accounting	X										
Adventure Recreation & Leisure Studies	X										
Business Computer Management	X										
Clinical Laboratory Technician	X										
Computer Science-Networking Option		X	X								
Computer Science-Internet/Website Design		X	X								
Criminal Justice	X										
Early Childhood Education	X										
Human Services	X										
Liberal Arts	X	X									
Nursing	X										
Occupational Therapy Assistant	X										
Physical Therapy Assistant	X										
Respiratory Therapy	X										
Restaurant Management		X									
Teacher Education	X	X									

NHTI - Concord Mathematics Requirements by Program

	MT120 Contemp. College Math	MT123 Intermediate Algebra	MT125 Finite Mathematics	MT129 Math for Allied Health	MT133 Elementary Functions	MT134 Pre-Calculus	MT205 Calculus I	MT206 Calculus II	MT251 Statistics
Accounting		X	X						
Addiction Counseling	X								
Animation and Graphic Game Programming*		X			X				
Architectural Engineering Technology					X	X	X		
Broadband Networking & Communications Technology					X	X	X		
Business Administration		X	X						
Computer Engineering Technology					X	X	X		
Criminal Justice	X								
Dental Hygiene				X					
Early Childhood Education	X								
Education-Associate of Arts		X	X						
Education-Associate of Science*	X	X							
Electronic Engineering Technology					X	X	X		
General Studies	X								
Health Science	X								
Hotel Administration	X								
Human Services	X								
Information Technology		X	X						
Liberal Arts**		X	X						X
Manufacturing Engineering Technology					X	X	X		
Marketing		X							
Mechanical Engineering Technology					X	X	X		
Nursing				X					
Paralegal Studies		X							
Paramedic Emergency Medicine				X					
Radiation Therapy					X				
Radiologic Technology	X								
Real Estate	X								
Sports Management		X							
Travel & Tourism	X								
Visual Arts		X	X						

*Either MT120 or MT123

**Two Math Courses required at the MT123 level or higher

NHCTC - Laconia Mathematics Requirements by Program

	<i>LMATH230</i>	<i>LMATH131</i>	<i>LMATH320</i>	<i>LMATH330</i>	<i>LMATH1410</i>	<i>LMAT2050</i>	<i>LMAT2100</i>	<i>LMAT2104</i>	<i>LMAT2150</i>	<i>LMAT2250</i>	<i>LMAT2350</i>	<i>LMAT2450</i>	<i>LMAT2700</i>	<i>LMAT2710</i>
	Introductory Algebra	Boolean Algebra	Technical Math I	Technical Math II	Geometry	Mathematical Concepts	Intermediate Algebra	Trigonometry	Statistics	Finite Math	Pre-Calculus	Advanced Topics	Calculus I	Calculus II
Accounting	X													
Automotive Service Education Program			X											
Business Management	X													
Computer Technologies	X							X						
Early Childhood Education	X													
Electrical Power & Control Technologies		X	X	X										
Electrical Systems Installation & Maint.			X	X										
Energy Services and Technology	X													
Fine Arts	X				X									
Fire Technology	X													
General Studies	X													
Graphic Design & Printing Technology	X													
Human Services	X													
Liberal Arts	X							X						
Lodging & Conference Management	X													
Marine Technology			X											
Nursing	X													
Office Technology Management	X													
Restaurant Management	X													
Teacher Preparation						X	X							

* Most programs require Mathematics electives; therefore, students take courses based on the placement exam. The courses listed by major are the minimum requirements. Students are encouraged to enroll in the higher level courses when possible.

NHCTC - Manchester Mathematics Requirements by Program

MATH111 Numerical Geometry
MATH131 College Algebra I
MATH132 Business Mathematics
MATH135 Numerical Algebra & Trig.
MATH141 Technical Mathematics
MATH151 Intermediate Algebra
MATH170 Discrete Mathematics
MATH171 Pre-Calculus
MATH200 Finite Mathematics
MATH202 Probability & Statistics
MATH204 Calculus I
MATH214 Calculus II

	<i>MATH111</i>	<i>MATH131</i>	<i>MATH132</i>	<i>MATH135</i>	<i>MATH141</i>	<i>MATH151</i>	<i>MATH170</i>	<i>MATH171</i>	<i>MATH200</i>	<i>MATH202</i>	<i>MATH204</i>	<i>MATH214</i>
Accounting		X								X		
Administrative Professional			X									
Automotive Technology	X			X								
Building Construction Technology	X			X								
Computer Technologies					X							
Early Childhood Education		X										
Exercise Science		X										
Graphic Design		X	X									
Heating Ventilation & Air Conditioning	X			X								
Human Services		X										
Interior Design		X	X									
Liberal Arts		X								X		
Liberal Arts/Teacher Prep								X	X			
Management		X								X		
Marketing		X								X		
Medical Assistant		X										
Nursing		X										
Welding	X			X								

Notes: 1. Math 151 may be substituted for Math 131 with satisfactory placement scores or instructor permission.
 2. The courses listed by major are the minimum requirements. Students are encouraged to enroll in higher level math courses.

NHCTC - Nashua Mathematics Requirements by Program

MTHN104 Topics in Mathematics
MTHN106 Elementary Statistics
MTHN108 Contemporary Math.
MTHN110 Algebra & Trigonometry
MTHN115 Finite Mathematics
MTHN120 Pre-Calculus
MTHN210 Calculus I
MTHN211 Calculus II
MTHN212 Multivariate Calculus
MTHN215 Linear Algebra
MTHN216 Math Language Logic & Proof
MTHN217 Probability & Statistics
MTHN220 Elementary Differential Equations

Automotive Technology				X									
Aviation Technology				X									
Business Administration		X			X								
Collision Repair Technology				X									
Computer Aided Drafting & Design Technology				X									
Computer Engineering Technology				X		X							
Computer Science				X									
Early Childhood Education	X												
Electronic Engineering Technology				X		X							
General Studies				X	X								
Honda Automotive Technology				X									
Human Services	X												
Liberal Arts				X	X								
Machine Tool Technology				X									
Nursing		X											
Paralegal Studies		X			X								
Restaurant Management				X	X								
Speech Language Pathology Assistant					X								
Teacher Education				X	X								
Telecommunications Technology				X									

NHCTC - Stratham Mathematics Requirements by Program

	<i>MATH131 College Algebra I</i>	<i>MATH132 Business Mathematics</i>	<i>MATH141 Technical Mathematics</i>	<i>MATH151 Intermediate Mathematics</i>	<i>MATH170 Discrete Algebra</i>	<i>MATH171 Pre-Calculus</i>	<i>MATH200 Finite Mathematics</i>	<i>MATH202 Probability & Statistics</i>	<i>MATH204 Calculus I</i>	<i>MATH214 Calculus II</i>
Accounting	X						X			
Automotive	X	X								
Biotechnology			X				X			
Business Management	X						X			
Criminal Justice	X									
Computer Technologies		X								
Early Childhood Education	X									
General Studies*										
Hospitality Management	X									
Information Systems Technology		X								
Liberal Arts**										
Liberal Arts/Business	X					X				
Liberal Arts/Teacher Prep**										
Marketing	X						X			
Nursing	X									
Surgical Technology	X									
Veterinary Technology			X							

* 3 credit elective

** 3 and 4 credit elective (Math 131 recommended as 3 credit elective)

Survey Results from Community College Math Faculty and Learning Center Staff:

What Weaknesses in Entering Student Math Preparation Do You See?

What Advice Do You Have for Secondary School Students Preparing for College?

- *What Issues or Characteristics are Students Bringing to the Classroom that Serve as Barriers to Their Success?*
 - Weak Math Skills
 - Fear or Anxiety
 - Weak Analytical Skills
 - Low Motivation
 - Low or Erratic Attendance
 - Weak Study Skills
- *What Non-Math Skills are Essential for Success?*
 - Motivation to Learn
 - Strong Study Skills
 - Time Management
 - Reading Comprehension
 - Self-Direction
 - Analytical Skills

What High School Students Need to Know:

- **Develop a global understanding of the value of math. Basic math, logic, reasoning, and problem solving are skills used throughout school and life**
- **The calculator is a great tool, but should not be a “crutch”. You need to “understand” math, not just “do” math.**
- **Attendance alone is insufficient to pass a college course in math. Success is based on active participation and assessment.**
- **Do not allow too much time to go by without taking a math course or using your math skills.**
- **Know your learning style and how that impacts your approach to learning math. Use appropriate strategies for taking notes and studying for tests.**
- **Take ownership of your learning. Ask for help when needed; moving onto the next lesson, unit, or course without an understanding leads to disaster.**

The Costs of Coming to a New Hampshire Community College Unprepared in Math are Real!

“Pay Me Now, or Pay Me Later”

- Developmental math course costs = \$525 – \$700 Per Course
~ Some students take Two
- These courses Do Not satisfy degree requirements
- These courses are often a student’s Most Difficult, first-semester subject
- Every Associate’s Degree program in the Community College System of New Hampshire, requires the completion of at least one College-Level math course
- Please stress with your advisees the significant costs, in both Time and Money, associated with enrolling in one of New Hampshire’s Community Colleges having failed to master the fourteen algebraic competencies described on page 2 of the Handbook.

A Program for Secondary Schools to Consider:

Running Start Threshold Math Course Option

- Option available for middle-ability high school students to take *Threshold* (first for degree-credit) math courses in Junior or Senior year, e.g.,
 - Algebra/Trigonometry I, and Business Math
- Courses satisfy math requirements for many CCSNH majors
- Creates Confidence and Momentum to be carried into the postsecondary experience
- This option will be further developed by the Community Colleges and presented for consideration to high school math department chairs

New Student General Application Information

The following information is intended to serve as a general guide to the filing requirements for Admissions and Financial Aid at each of the seven New Hampshire Community Colleges. For the most up-to-date application information, please refer to the current catalog or website for the campuses to which you plan to apply.

In general, for students seeking both admission and financial assistance, the following must be completed and filed:

- An admissions application, available from and unique to each campus
- The Free Application for Federal Student Aid (FAFSA), available at www.fafsa.ed.gov
- Additional application materials may be required for specific academic programs and to validate your eligibility for financial aid – The catalog will state, or you will be notified, if these supplemental steps are necessary

Campus	Admissions Application Filing Dates	Financial Aid Application Filing Dates
Berlin	Nursing on a rolling basis All other programs until classes are filled	File by May 1 for priority consideration
Claremont	Nursing by December 1 All other programs until classes are filled	Filing by April 1 is recommended
Laconia	Nursing preferred by February 1 All other programs until classes are filled	File by May 1 for priority consideration
NHTI	Application filing deadlines are specific by program Please see catalog or website	<u>Receipt</u> of the FAFSA by May 1 for priority consideration
Manchester	Nursing by February 1 All other programs until classes are filled	File FAFSA eight weeks prior to the beginning of classes
Nashua	Nursing by December 31 All other programs until classes are filled	File FAFSA by May 1 for priority consideration
Stratham	Nursing by February 28 All other programs until classes are filled	File FAFSA by May 1 for priority consideration



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