Name	ID#	Date

Planning Sheet: Pre-Engineering (Dual Degree)

(Minimum Course Requirements for Admission to the Dual-Degree or Three-Two Programs)

Term	Grade	Course #	AugCore	Title
____	____	CHM 115	NSM-L	General Chemistry I (Prereq: MPG 3)
____	____	CHM 116	NSM-L	General Chemistry II (Prereq: CHM 115)
____	____	CSC 170		Structured Programming (Prereq: Pass CT assessment or GST 100, CSC 160, MAT 171 recommended)
____	____	ENL 111		Effective Writing
____	____	PHY 121	NSM-L	General Physics I (Prereq: MAT 145 or concurrent reg.)
____	____	PHY 122	NSM-L	General Physics II (Prereq: ENL 111 or 112 or HON 111, PHY 121, & MAT 146 or concurrent reg.
Mathematics (Four Courses)				
____	____	MAT 145	NSM	Calculus I (Prereq: MPG 4)
____	____	MAT 146	NSM	Calculus II (Prereq: MAT 145)
____	____	MAT 245		Calculus III (Prereq: MAT 146)
____	____	MAT/PHY 327		Special Functions (Prereq: PHY 122 & MAT 245 or consent of instructor)

Plus additional courses to meet general education requirements and a total of **24** courses at Augsburg. The student should consult with their department for specific major requirements.

Notes:

- Students should take PHY 121 & 122: General Physics I & II *and* MAT 145 &146: Calculus I & II during their first year.
- Students interested in Physics but not testing at MPG 4 may consider taking PHY 116: Introduction to Physics & MAT 114: Pre-Calculus during their first year. This would prepare such students for PHY 121 & 122 during the second year. Students might also consider CHM 115 & CHM 116: General Chemistry I & II and MAT 114: Pre-Calculus during the first year. The Chemistry sequence is required for the pre-engineering program & the BS degree in Physics.
- Students interested in chemical engineering also should take CHM 351,352.
- See the college catalog (under engineering) and contact the pre-engineering advisor for more information on the dual-degree or three-two programs.
- **Keystone:** Complete SCI 490 or a keystone through a different department as part of a second major or minor.
- **Abbreviation Key:** ML = Modern Language; SC = Signature Curriculum; EM = Engaging Minneapolis; AE = Augsburg Experience; KC = Senior Keystone Course; NSM = Natural Science & Mathematics - no lab; NSM-L = Natural Science & Mathematics-with lab; SBS = Social & Behavioral Science; FA = Fine Arts; HUM = Humanities; QA = Quantitative Applications; QF = Quantitative Foundations; QFA = Quantitative Foundations & Applications.

See back for information on graduation skills requirements

Planning Sheet: GRADUATION SKILLS REQUIREMENTS

These requirements were implemented for Fall 2008. Please talk with your faculty advisor for information.

Graduation skills, including the Quantitative Reasoning requirements, are completed as follows. Graduation skills in Critical Thinking, Writing, Speaking, and Quantitative Reasoning are required for graduation. Critical Thinking is embedded in all majors. Plans for completion of other graduation skills are determined by the major department. Consult your department chair or faculty advisor to select appropriate courses to meet the Quantitative Reasoning (QR) graduation skill. QR is satisfied by completing one (1) Quantitative Foundational course (QF) and one (1) Quantitative Application course (QA), or one (1) combined QFA course. The most current information on Graduation Skills can be found in the Augsburg College catalog at www.augsburg.edu/catalog/.

Transfer students must consult an advisor about potential adjustments to their course requirements to fulfill each graduation skill.

Designated Major Course	GRADUATION SKILLS – Physics		Completed
Embedded in major	**Writing Requirements** TWO (2) Writing courses		
Embedded in major			
COM 115	**Speaking** One (1) Speaking course		
Designated Major Course	**QUANTITATIVE REASONING**		Completed
Embedded in major	**Quantitative Foundations & Applications** One (1) QFA course (Prereq: MPG3)	QFA course	
– OR –			
Embedded in major	**Quantitative Foundations and Quantitative Applications** One (1) QF course (Prereq: MPG 3) **and** one (1) QA course	QF course	
Embedded in major		QA course	

Graduation Tally Checklist

These requirements were implemented in April 2003 and remain in effect until further notice.

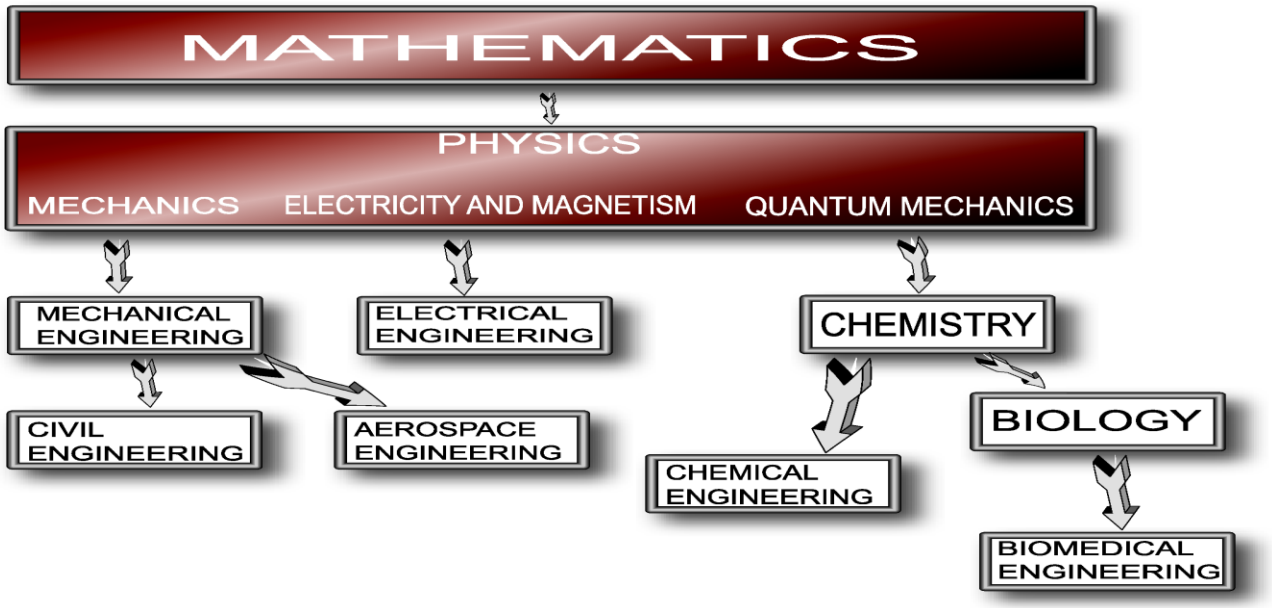
Requirement	Progress Towards Completion	
Cumulative Course Credits ▪ Minimum number of course credits needed for graduation = **128** ▪ At least 32 semester credits completed at Augsburg. ▪ 24 of last 32 semester credits completed in residence. ▪ Second degree – minimum of 32 sem. credits completed in residence.	Transfer Credits Earned	
	+ Aug. Credits Earned	
	= Total Credits Earned	
	# Credits Needed	

Grade Point Average (GPA) ▪ Minimum 2.0 GPA required in major, minor, & overall. ▪ Some majors require higher GPA. ▪ Latin Honors GPA requirements: ○ Summa cum laude: 3.9-4.0 ○ Magna cum laude: 3.80-3.89 ○ Cum laude: 3.60-3.79	Cumulative GPA	
	Major 1 GPA	
	Major 2 GPA	
	Minor GPA	

Other Limits	Minimum/Maximum	Your Total
Overall maximum courses graded Pass/No Pass (P/N) ▪ Grade of 2.0 or above required to Pass and earn credit for course. ▪ Maximum of 8 of 24 sem. credits P/N may be in major.	Maximum of 24 sem. Credits	
Major Courses graded Pass/No Pass (P/N)	Maximum of 8 semester credits	
Latin Honors courses graded Pass/No Pass (P/N)	Maximum of 8 semester credits	
Latin Honors traditionally graded courses	Minimum of 54 semester credits	
Internships	Maximum of 16 semester credits	
Independent/Directed Studies	Maximum of 8 semester credits	

Question: Why should I spend five years in the 3-2 program instead of just going directly to the U of Minnesota in engineering for four years? Biased answer (from a physicist):

Physics is the most fundamental of all the sciences. You might even go to the extreme of saying that all natural science is to a large extent an application of physics and mathematics. Consider the following schematic diagram illustrating the relationship of physics to the other natural sciences:



Notice that mathematics is at the top of this chart showing how vital it is in the sciences and engineering. A student planning for a career in science and engineering should obtain a solid mathematical background. Physics is next on the chart showing how a solid foundation in physics will enable the student to understand engineering on a deeper more fundamental level. Having a strong background in mathematics and physics enables the student to know when a particular method is appropriate for a given physical situation. Rather than accept a table of numbers derived from some unknown formula, an engineer with a strong background in physics and mathematics will try to determine if the particular formula being used is appropriate or not.

Now let us answer the question. By attending Augsburg College for three years and transferring to an engineering school you will receive a deeper understanding of physics and mathematics than you would gain through the more conventional route. Most engineers have a minimal background in physics (typically one year) and mathematics (typically three or four semester courses). The extra year in the three-two program gives you that extra depth in physics and mathematics that will translate to a deeper knowledge of engineering. Since technology moves so quickly, many engineers find that their formal training becomes obsolete within about five years. On the other hand, if the engineer does have a strong mathematics and physics background, this person will easily adapt to the new engineering application of physics and mathematics.

Finally, on a personal level, Augsburg is a small liberal arts school where you are valued as a person not just an insignificant component of a huge class (~175 students or more). At Augsburg, the classes are small where you can get to know your professors who will take the time to ensure that you have the best chance of success. There are also many research opportunities available where you work closely with faculty on cutting edge research. Many of our students also enjoy the large variety of extracurricular activities that are available here at Augsburg. In the three-two program, you will enjoy the atmosphere of a small school (in the city) for three years before you transfer to the larger engineering school.

At Augsburg, we will help you develop into a complete and well-rounded person not just a “techie” who is unable to communicate their ideas with others. The strong liberal arts component here at Augsburg ensures this.

For the above reasons, we believe that the three-two program is a solid and effective way to reach your goal of becoming an engineer.

We welcome you.