B.S. in Applied Physics (Optics Emphasis) 2020-2021: Option 1 - CWILT

FIRST YEAR			
Fall	Credits Interim	Credits Spring	Crea
PHY 292	4 GES 125 Introduction to the Creative Arts	4 <u>PHY 296</u>	
<u>& PHY 292D</u>		<u>& PHY 297</u>	
General Physics I and General Physics I Lab *1		General Physics II and General Physics II Lab	
BIB 101 Introduction to the Bible	3	GES 130 Christianity Western Culture	
GES 160 Inquiry Seminar	3	GES 140 Introduction to Wellbeing	
MAT 124M1 Calculus 1	4	MAT 125 Calculus 2	
	14	4	
SECOND YEAR			
	Credits Interim	Credits Spring	Cred
	4 World Cultures (U) course		creu
<u>PHY 302</u>	4 World Cultures (0) course	³ <u>PHY 312</u>	
<u>& PHY 303</u>		& PHY 313	
Electronics and Electronics Lab	3	Modern Physics and Modern Physics Lab	
COS 205 Scientific Computing	5	PHY 352	
		<u>& PHY 353</u>	
		Computer Methods in Physics and Engineering and Computer Methods in Physics and Engineering Lab	
MAT 223 Multivariable Calculus	3	MAT 222 Differential Equations	
PHY 260 Careers in Engineering and Physics Seminar		Second Language (S) course *2	
Contemporary Western Life and Thought (L) course	3		
	14	3	
THIRD YEAR			
Fall	Credits Interim	Credits Spring	Cred
			0.04
<u>CHE 208</u>	4 Science, Technology, and Society (K) course	³ PHY 365 Physics Research Seminar	0.04
<u>CHE 208</u> <u>& CHE 208D</u>			0.00
CHE 208 & CHE 208D Accelerated General Chemistry and Accelerated General Chemistry Lab		3 PHY 365 Physics Research Seminar	
<u>CHE 208</u> <u>& CHE 208D</u>	4 Science, Technology, and Society (K) course	3 PHY 365 Physics Research Seminar PHY 432	
CHE 208 & CHE 208D Accelerated General Chemistry and Accelerated General Chemistry Lab	4 Science, Technology, and Society (K) course	3 PHY 365 Physics Research Seminar PHY 432 PHY 433	
CHE 208 & CHE 208D Accelerated General Chemistry and Accelerated General Chemistry Lab PHY 320 Mathematical Methods in Physics and Engineering	4 Science, Technology, and Society (K) course	3 PHY 365 Physics Research Seminar PHY 432 & PHY 433 Topics in Contemporary Optics and Topics in Contemporary Optics Lab	
CHE 208 & CHE 208D Accelerated General Chemistry and Accelerated General Chemistry Lab PHY 320 Mathematical Methods in Physics and Engineering PHY 490 Research	Science, Technology, and Society (K) course	3 PHY 365 Physics Research Seminar PHY 432 & PHY 433 Topics in Contemporary Optics and Topics in Contemporary Optics Lab Comparative Systems (G) course	
CHE 208 & CHE 208D Accelerated General Chemistry and Accelerated General Chemistry Lab PHY 320 Mathematical Methods in Physics and Engineering	4 Science, Technology, and Society (K) course	3 PHY 365 Physics Research Seminar PHY 432	
CHE 208 & CHE 208D Accelerated General Chemistry and Accelerated General Chemistry Lab PHY 320 Mathematical Methods in Physics and Engineering PHY 490 Research	4 Science, Technology, and Society (K) course 4	3 PHY 365 Physics Research Seminar PHY 432 & PHY 433 Topics in Contemporary Optics and Topics in Contemporary Optics Lab Comparative Systems (G) course Interpreting Biblical themes (J) course Elective	
CHE 208 & CHE 208D Accelerated General Chemistry and Accelerated General Chemistry Lab PHY 320 Mathematical Methods in Physics and Engineering PHY 490 Research THE 201 Christian Theology	Science, Technology, and Society (K) course	3 PHY 365 Physics Research Seminar PHY 432	
CHE 208 & CHE 208D Accelerated General Chemistry and Accelerated General Chemistry Lab PHY 320 Mathematical Methods in Physics and Engineering PHY 490 Research	4 Science, Technology, and Society (K) course 4	3 PHY 365 Physics Research Seminar PHY 432 & PHY 433 Topics in Contemporary Optics and Topics in Contemporary Optics Lab Comparative Systems (G) course Interpreting Biblical themes (J) course Elective	
CHE 208 & CHE 208D Accelerated General Chemistry and Accelerated General Chemistry Lab PHY 320 Mathematical Methods in Physics and Engineering PHY 490 Research THE 201 Christian Theology	4 Science, Technology, and Society (K) course 4	3 PHY 365 Physics Research Seminar PHY 432 & PHY 433 Topics in Contemporary Optics and Topics in Contemporary Optics Lab Comparative Systems (G) course Interpreting Biblical themes (J) course Elective	
CHE 208 & CHE 208D Accelerated General Chemistry and Accelerated General Chemistry Lab PHY 320 Mathematical Methods in Physics and Engineering PHY 490 Research THE 201 Christian Theology FOURTH YEAR	4 Science, Technology, and Society (K) course 4 4 3 3 13 14	3 PHY 365 Physics Research Seminar PHY 432 PHY 432 & PHY 433 Topics in Contemporary Optics and Topics in Contemporary Optics Lab Comparative Systems (G) course Interpreting Biblical themes (J) course Elective 3	
CHE 208 & CHE 208D Accelerated General Chemistry and Accelerated General Chemistry Lab PHY 320 Mathematical Methods in Physics and Engineering PHY 490 Research THE 201 Christian Theology FOURTH YEAR Fall	A Science, Technology, and Society (K) course A A 3 A 3 A 14 A	3 PHY 365 Physics Research Seminar PHY 432 PHY 432 & PHY 433 Topics in Contemporary Optics and Topics in Contemporary Optics Lab Comparative Systems (G) course Interpreting Biblical themes (J) course Elective 3 Credits Spring	
CHE 208 & CHE 208D Accelerated General Chemistry and Accelerated General Chemistry Lab PHY 320 Mathematical Methods in Physics and Engineering PHY 490 Research THE 201 Christian Theology FOURTH YEAR Fall	A Science, Technology, and Society (K) course A A 3 A 3 A 14 A	3 PHY 365 Physics Research Seminar PHY 432 PHY 433 Topics in Contemporary Optics and Topics in Contemporary Optics Lab Comparative Systems (G) course Interpreting Biblical themes (J) course Elective 3 Credits Spring PHY 332	
CHE 208 & CHE 208D Accelerated General Chemistry and Accelerated General Chemistry Lab PHY 320 Mathematical Methods in Physics and Engineering PHY 490 Research THE 201 Christian Theology FOURTH YEAR Fall	A Science, Technology, and Society (K) course A A 3 A 3 A 14 A	3 PHY 365 Physics Research Seminar 9 PHY 432 & PHY 433 Topics in Contemporary Optics and Topics in Contemporary Optics Lab Comparative Systems (G) course Interpreting Biblical themes (J) course Elective 3 Credits Spring PHY 332 & PHY 333	
CHE 208 <u>& CHE 208D</u> Accelerated General Chemistry and Accelerated General Chemistry Lab PHY 320 Mathematical Methods in Physics and Engineering PHY 490 Research THE 201 Christian Theology FOURTH YEAR Fall PHY 400 Electricity and Magnetism	4 Science, Technology, and Society (K) course 4 4 3 3 14 14 Credits Interim 4 Interim Off	3 PHY 365 Physics Research Seminar 9 PHY 432 & PHY 433 Topics in Contemporary Optics and Topics in Contemporary Optics Lab Comparative Systems (G) course Interpreting Biblical themes (J) course Elective 3 Credits Spring PHY 332 & PHY 333 Optics and Optics Lab PHY 332 PHY 432 PHY 432	
CHE 208 <u>& CHE 208D</u> Accelerated General Chemistry and Accelerated General Chemistry Lab PHY 320 Mathematical Methods in Physics and Engineering PHY 490 Research THE 201 Christian Theology FOURTH YEAR Fall PHY 400 Electricity and Magnetism	4 Science, Technology, and Society (K) course 4 4 3 3 14 14 Credits Interim 4 Interim Off	3 PHY 365 Physics Research Seminar PHY 432 & PHY 433 Topics in Contemporary Optics and Topics in Contemporary Optics Lab Comparative Systems (G) course Interpreting Biblical themes (J) course Elective 3 Credits Spring PHY 332 & PHY 333 Optics and Optics Lab	Cred
CHE 208 <u>& CHE 208D</u> Accelerated General Chemistry and Accelerated General Chemistry Lab PHY 320 Mathematical Methods in Physics and Engineering PHY 490 Research THE 201 Christian Theology FOURTH YEAR Fall PHY 400 Electricity and Magnetism PHY 440 Quantum Mechanics	A Science, Technology, and Society (K) course A	3 PHY 365 Physics Research Seminar 9 PHY 432 & PHY 433 Topics in Contemporary Optics and Topics in Contemporary Optics Lab Comparative Systems (G) course Interpreting Biblical themes (J) course Elective 3 Credits Spring PHY 332 & PHY 333 Optics and Optics Lab PHY 333 Optics and Optics Lab PHY 432 & PHY 432 & PHY 433 (spring, even) Topics in Contemporary Optics, Topics in Contemporary Optics	Cred
CHE 208 & CHE 208 Accelerated General Chemistry and Accelerated General Chemistry Lab PHY 320 Mathematical Methods in Physics and Engineering PHY 490 Research THE 201 Christian Theology FOURTH YEAR Fall PHY 400 Electricity and Magnetism PHY 440 Quantum Mechanics Contemporary Christian Issues (P) course	A Science, Technology, and Society (K) course A A 3 A 3 A 14 A Credits Interim Interim Off A 1 A 3 A	3 PHY 365 Physics Research Seminar PHY 432	Cred
CHE 208 & CHE 208 Accelerated General Chemistry and Accelerated General Chemistry Lab PHY 320 Mathematical Methods in Physics and Engineering PHY 490 Research THE 201 Christian Theology FOURTH YEAR Fall PHY 400 Electricity and Magnetism PHY 440 Quantum Mechanics Contemporary Christian Issues (P) course Cross-Cultural Experience (Z) course	A Science, Technology, and Society (K) course A A 3 A 3 A 3 A 4 Interim A Interim Off 4 Interim Off 3 A 0 A 0 A	3 PHY 365 Physics Research Seminar 9 PHY 432 & PHY 433 Topics in Contemporary Optics and Topics in Contemporary Optics Lab Comparative Systems (G) course Interpreting Biblical themes (J) course Elective 3 Credits Spring PHY 332 & PHY 333 Optics and Optics Lab PHY 433 (spring, even) Topics in Contemporary Optics, Topics in Contemporary Optics Lab Elective Elective Lab Elective Leisure and Lifetime Sport (Q) course	Cred
CHE 208 & CHE 208 Accelerated General Chemistry and Accelerated General Chemistry Lab PHY 320 Mathematical Methods in Physics and Engineering PHY 490 Research THE 201 Christian Theology FOURTH YEAR Fall PHY 400 Electricity and Magnetism PHY 440 Quantum Mechanics Contemporary Christian Issues (P) course	A Science, Technology, and Society (K) course A A 3 A 3 A 14 A Credits Interim Interim Off A 1 A 3 A	3 PHY 365 Physics Research Seminar PHY 432	Cred

*1. Students may also choose to use this course to meet a General Education requirement.

*2. Students must complete through the second semester of a first year language course or equivalent (Check the catalog for details of this option.)

Most financial aid packages stipulate 12 credits/semester; Minnesota state grants are reduced when credit load falls below 15 credits/semester. (Interim credits may be split between fall and spring for state grant purposes only.)

B.S. in Applied Physics (Optics Emphasis) 2020-2021: Option 2 - Humanities

FIRST YEAR					
Fall	Credits Interim Credits			Spring	Credits
<u>PHY 292</u>	4	GES 147 Humanities II: Renaissance and Reformation	4	PHY 296	4
<u>& PHY 292D</u>				<u>& PHY 297</u>	
General Physics I and General Physics I Lab *1				General Physics II and General Physics II Lab	
GES 145 Humanities I: Greco-Roman through Middle Ages	4			GES 244 Humanities III: European Enlightenment and American	4
				Culture to 1877	
GES 140 Introduction to Wellbeing	3			BIB 101 Introduction to the Bible	3
MAT 124M1 Calculus 1	4			MAT 125 Calculus 2	4
	15		4		15
SECOND YEAR					
Fall	Credits	Interim	Credits	Spring	Credits
PHY 302	4	World Cultures (U) course	3	PHY 312	4
<u>& PHY 303</u>				<u>& PHY 313</u>	
Electronics and Electronics Lab				Modern Physics and Modern Physics Lab	
COS 205 Scientific Computing	3			PHY 352	4
				& PHY 353	
				Computer Methods in Physics and Engineering and Computer Methods in	
				Physics and Engineering Lab	
MAT 223 Multivariable Calculus	3			MAT 222 Differential Equations	3
GES 246 Humanities IV: Modern and Contemporary Western Culture	4			Second Language (S) course *2	4
	14		3		15
THIRD YEAR	0 14		0 11		
Fall		Interim	-	Spring	Credits
<u>CHE 208</u>	4	Science, Technology, and Society (K) course	3	PHY 365 Physics Research Seminar	1
& CHE 208D					
Accelerated General Chemistry and Accelerated General Chemistry					
Lab	4			Comparative Systems (G) course	3
PHY 320 Mathematical Methods in Physics and Engineering Elective	3			Interpreting Biblical themes (J) course	3
LIGGUAG	3			Elective	3
	40		3		14
FOURTH YEAR	12		3	· · · · · · · · · · · · · · · · · · ·	14
FOURTH YEAR Fall	Cradita	Interim	Cradita	Spring	Credits
		Interim Off	Credits	Spring	4
PHY 400 Electricity and Magnetism	4			PHY 332 & PHY 333	4
				Optics and Optics Lab	
PHY 440 Quantum Mechanics	4			Leisure and Lifetime Sport (Q) course	1
PHY 490 Research	3			Artistic Experience (A) course	0-3
Contemporary Christian Issues (P) course	3			Electives	8
Cross-Cultural Experience (Z) course	0-3				
	14-17		0		13-16

*1. Students may also choose to use this course to meet a General Education requirement.

*2. Students must complete through the second semester of a first year language course or equivalent (Check the catalog for details of this option.)

Most financial aid packages stipulate 12 credits/semester; Minnesota state grants are reduced when credit load falls below 15 credits/semester. (Interim credits may be split between fall and spring for state grant purposes only.)