

# ENGINEERING PHYSICS (B.S.)

## Requirements

Code	Title	Units
Core Curriculum Requirements ( <a href="https://catalog.vanguard.edu/college/core-curriculum/">https://catalog.vanguard.edu/college/core-curriculum/</a> )		54-52
Major Core Requirements		72
<b>Total Units</b>		<b>126-124</b>

### Engineering Physics Major Core Requirements

Code	Title	Units
<b>Lower Division Course Requirements</b>		
CHEM-120 & 120L	General Chemistry I and General Chemistry I Lab <sup>1</sup>	4
CHEM-121 & 121L	General Chemistry II and General Chemistry II Lab	4
CSCI-100C & 100CL	Introduction to Computer Science and Introduction to Computer Science Lab	4
MATH-180C	Calculus I	4
MATH-181C	Calculus II	4
MATH-265C	Intro to Statistical Methods	3
MATH-281	Multivariable Calculus	4
PSCI-223C & 223CL	Mechanics and Heat and Mechanics and Heat Lab	4
PSCI-225 & 225L	Electricity, Magnetism, and Light and Electricity, Magnetism, and Light Lab	4
<b>Upper Division Course Requirements</b>		
MATH-300	Linear Algebra	3
MATH-310	Differential Equations	3
MATH-390	Numerical Analysis	3
ENGR-310 & 310L	Electronics I and Electronics I Lab	5
ENGR-320 & 320L	Optics and Optics Laboratory	5
ENGR-400 & 400L	Introduction to Materials Science and Intro/Materials Science Laboratory	4
CHEM-440 & 440L	Instrumental Analysis and Instrumental Analysis Lab	4
CHEM-456 & 456L	Physical Chemistry: Thermodynamics and Physical Chemistry Technique Lab	4
CHEM-458	Physical Chemistry: Quantum Mechanics	2
CHEM-485 or CHEM-450	Undergraduate Research UG Research Or Internship Program	2
CHEM-499C	Chemistry Capstone Seminar	2
<b>Total Units</b>		<b>72</b>

<sup>1</sup> See CHEM-120 General Chemistry I course description for prerequisites.

## Four Year Plan

**Disclaimer:** This *sample* Four Year Plan is provided as a guide for the recommended sequencing of courses. Vanguard University requires that students complete a minimum of 120 units of required course work as outlined on the Requirements tab in order to receive a Bachelor of Arts, Bachelor of Music, Bachelor of Science, or Bachelor of Science in Nursing degree. It is the student's responsibility to confirm with the department the course rotation before enrolling in courses. If applicable, please note the footnotes at the bottom of the page for additional information related to courses listed in a particular year and term. Questions, contact the Department of Chemical and Environmental Sciences.

Course	Title	Units
<b>Year 1 Term 1</b>		
NT-101C	New Testament Survey	3
SOC-PLCR	Social Science Core Curriculum Reqmt	3
MATH-180C	Calculus I	4
CHEM-120	General Chemistry I	3
CHEM-120L	General Chemistry I Lab	1
CORE-100C	Cornerstone	1
<b>Units</b>		<b>15</b>
<b>Year 1 Term 2</b>		
MATH-285	Intro to Adv Mathematics	3
CSCI-100C	Introduction to Computer Science	3
CSCI-100CL	Introduction to Computer Science Lab	1
MATH-181C	Calculus II	4
CHEM-121	General Chemistry II	3
CHEM-121L	General Chemistry II Lab	1
<b>Units</b>		<b>15</b>
<b>Year 2 Term 1</b>		
MATH-281	Multivariable Calculus	4
MATH-300	Linear Algebra	3
THEO-101C	Foundations of Christian Life	3
PSCI-223C	Mechanics and Heat	3
PSCI-223CL	Mechanics and Heat Lab	1
CHEM-252	Analytical Chemistry	3
CHEM-252L	Analytical Chem Techniques	1
<b>Units</b>		<b>18</b>
<b>Year 2 Term 2</b>		
MATH-265C	Intro to Statistical Methods	3
MATH-310	Differential Equations	3
OT-201C	Old Testament Survey	3
PSCI-225	Electricity, Magnetism, and Light	3
PSCI-225L	Electricity, Magnetism, and Light Lab	1
FINA-PLCR	Fine Arts Core Curriculum Requirement	3
<b>Units</b>		<b>16</b>
<b>Year 3 Term 1</b>		
ENGL-120C	Persuasive Writing	3
MATH-390	Numerical Analysis	3
PSCI-227	Modern Physics	3



CHEM-456	Physical Chemistry: Thermodynamics	2
CHEM-440	Instrumental Analysis	2
CHEM-440L	Instrumental Analysis Lab	2
<b>Units</b>		<b>15</b>
<b>Year 3 Term 2</b>		
CHEM-456L	Physical Chemistry Technique Lab	1-2
CHEM-458	Physical Chemistry: Quantum Mechanics	2
ENGR-310	Electronics I	4
ENGR-310L	Electronics I Lab	1
HIST-PLCR1	History Core Requirement (US History)	3
CHEM-PLUGR	Undergraduate Research or Internship	2
COMM-201C	Speech Composition and Presentation	3
<b>Units</b>		<b>16-17</b>
<b>Year 4 Term 1</b>		
KINE-145C	Lifetime Fitness/Wellness Lect	1
THEO-300C	Developing a Christian World View	3
ENGR-400	Introduction to Materials Science	3
ENGR-400L	Intro/Materials Science Laboratory	1
HIST-PLCR2	History Core Requirement (World Civ)	3
<b>Units</b>		<b>11</b>
<b>Year 4 Term 2</b>		
KINE-146C	Lifetime Fitness/Well Activity	1
PSYC-103C	Introduction to Psychology	3
ENGL-230C	Literature and the Human Experience	3
ENGR-320	Optics	4
ENGR-320L	Optics Laboratory	1
CHEM-499C	Chemistry Capstone Seminar	2
CHIS-400C	Christian Heritage	3
<b>Units</b>		<b>17</b>
<b>Total Units</b>		<b>123-124</b>

