

ENGINEERING PHYSICS (CHEMICAL ENGINEERING) - BACHELOR OF SCIENCE IN ENGINEERING PHYSICS

A strong grasp of underlying physical principles behind the development of new technologies is necessary to keep up with new developments in a high-tech world. The Bachelor of Science (B.S.) in Engineering Physics program is designed to provide quality education to students for immediate employment with technical jobs in private industries (especially high-tech industries), research laboratories and public sectors. The program trains students with a combination of engineering knowledge, physics principles, mathematical background, problem-solving strategies and effective communication skills. The B.S. in Engineering Physics also provides an excellent preparation for graduate studies in either physics or an engineering discipline.

The requirements for the Chemical concentration are listed below. Students must earn a C- or better in all required courses.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 124 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i>		
ENGL 1110G	Composition I	4
<i>English Composition - Level 2¹</i>		
<i>Oral Communication¹</i>		3
<i>Area II: Mathematics</i>		
MATH 1511G	Calculus and Analytic Geometry I ²	4
<i>Area III/IV: Laboratory Sciences and Social/Behavioral Sciences</i>		
Select one sequence from the following for four credits:		
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	4
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics ³	4
Select one sequence from the following for four credits:		
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	4
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory ³	4
<i>Area IV: Social and Behavioral Sciences (3 credits)¹</i>		
<i>Area V: Humanities¹</i>		
<i>Area VI: Creative and Fine Arts¹</i>		3
<i>General Education Elective</i>		
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
Viewing A Wider World		
Viewing a Wider World Electives ⁴		6

Departmental/College Requirements

Program Specific Requirements

Mathematics

MATH 2530G	Calculus III	3
MATH 3160	Introduction to Ordinary Differential Equations	3

Natural Science

CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
CHEM 313	Organic Chemistry I	3

Electives

Technical Elective ⁵		3
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Physics

PHYS 2120 & 2120L	Heat, Light, and Sound and Heat, Light, and Sound Laboratory	4
PHYS 395	Intermediate Mathematical Methods of Physics	3
PHYS 451	Intermediate Mechanics I	3
PHYS 454	Intermediate Modern Physics I	3
PHYS 455	Intermediate Modern Physics II	3

Physics with Engineering Component

PHYS 315	Modern Physics	3
PHYS 325	Intermediate Experimental Physics	3
PHYS 461	Intermediate Electricity and Magnetism I	3
PHYS 462	Intermediate Electricity and Magnetism II	3

Engineering

CHME 101	Introduction to Chemical Engineering Calculations	2
CHME 102	Material Balances	2
CHME 201	Energy Balances & Basic Thermodynamics	3
CHME 303	Chemical Engineering Thermodynamics	4
CHME 305	Transport Operations I: Fluid Flow	3
CHME 306	Transport Operations II: Heat and Mass Transfer	4
CHME 307	Transport Operations III: Staged Operations	3
CHME 352 L	Simulation of Unit Operations	2
CHME 361	Engineering Materials	3
CHME 341	Chemical Kinetics and Reactor Engineering	3
ENGR 401	Engineering Capstone I	3
ENGR 402	Engineering Capstone II	3

Second Language: (not required)

Electives, to bring the total credits to 124	0
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Total Credits	124
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¹ See the General Education (<https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/>) section of the catalog for a full list of courses.

² MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.

³ PHYS 2110 Mechanics/PHYS 2110L Experimental Mechanics and PHYS 2140 Electricity and Magnetism/PHYS 2140L Electricity & Magnetism Laboratory will not automatically count towards the Area III: Laboratory Science requirement, an exception will be made if students elect to take these courses.

⁴ See the Viewing a Wider World (<https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext>)

section of the catalog for a full list of courses. See Alternatives for meeting VWW requirements (nine-credit rule).

⁵ Approved technical electives are decided by Engineering Physics Advisors.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change. Full-time students are usually required to take at least 15 credits per semester. This requirement could be satisfied for example by taking a one-credit supplemental instruction course.

First Year

Semester 1		Credits
MATH 1511G	Calculus and Analytic Geometry I ¹	4
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics ^{1,2}	4
CHME 101	Introduction to Chemical Engineering Calculations ¹	2
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors ¹	4
Credits		14

Semester 2

MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II ¹ or Calculus and Analytic Geometry II Honors	4
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory ^{1,2}	4
CHME 102	Material Balances ¹	2
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors ¹	4
Credits		14

Second Year

Semester 1		Credits
MATH 2530G	Calculus III ¹	3
PHYS 2120 & 2120L	Heat, Light, and Sound and Heat, Light, and Sound Laboratory ¹	4
CHME 201	Energy Balances & Basic Thermodynamics ¹	3
ENGL 1110G	Composition I	4
Area IV: Creative and Fine Arts Course ³		3
Credits		17

Semester 2

MATH 3160	Introduction to Ordinary Differential Equations ¹	3
PHYS 315	Modern Physics ¹	3
PHYS 325	Intermediate Experimental Physics	3
CHME 303	Chemical Engineering Thermodynamics ¹	4
CHME 305	Transport Operations I: Fluid Flow ¹	3
Credits		16

Third Year

Semester 1		Credits
PHYS 395	Intermediate Mathematical Methods of Physics ¹	3
PHYS 461	Intermediate Electricity and Magnetism I ¹	3
CHME 306	Transport Operations II: Heat and Mass Transfer ¹	4

CHEM 313	Organic Chemistry I ¹	3
ENGL 2210G	Professional and Technical Communication Honors	3
Credits		16

Semester 2

PHYS 462	Intermediate Electricity and Magnetism II ¹	3
CHME 307	Transport Operations III: Staged Operations ¹	3
CHME 352 L	Simulation of Unit Operations ¹	2
CHME 361	Engineering Materials ¹	3
CHME 341	Chemical Kinetics and Reactor Engineering	3
COMM 1115G	Introduction to Communication	3
Credits		17

Fourth Year

Semester 1

PHYS 451	Intermediate Mechanics I ¹	3
PHYS 454	Intermediate Modern Physics I ¹	3
ENGR 401	Engineering Capstone I	3
VWW: Viewing a Wider World Course ⁴		3
Technical Elective Course ⁵		3
Credits		15

Semester 2

PHYS 455	Intermediate Modern Physics II ¹	3
ENGR 402	Engineering Capstone II ¹	3
VWW: Viewing a Wider World Course ⁴		3
Area IV: Social and Behavioral Science Course ³		3
Area V: Humanities Course ³		3
Credits		15
Total Credits		124

¹ These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

² PHYS 2110 Mechanics/PHYS 2110L Experimental Mechanics and PHYS 2140 Electricity and Magnetism/PHYS 2140L Electricity & Magnetism Laboratory will not automatically count towards the Area III: Laboratory Science requirement, an exception will be made if students elect to take these courses.

³ See the General Education (<https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/>) section of the catalog for a full list of courses.

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⁵ Approved technical electives are decided by Engineering Physics advisors