

# Physics – Mechanical Engineering Track

## 3+2 Engineering Dual Degree Program

### Bachelor of Science (BS.PHYS(MECH))

Core Requirements			Credits	Notes/Instructions
College Sem.	Quest for Meaning	CSEM 100	3	†A student may be required to take ENGL 105 and/or MATH 100 based on placement exams administered prior to their first semester at King's College. ENGL 105 and MATH 100 are 3-credit courses and will count as free electives. †† The Intercultural Competence requirement can be satisfied by taking a 100-level language class for 3 credits or participating in an approved Study Abroad experience. SBM = Satisfied By King's Major requirement(s) and credit(s) listed below. (3) To satisfy the King's Core requirements, a student will need to complete three (3) Core requirements at Notre Dame or Washington University
Communication & Creative Expression	Writing	ENGL 110†	3	
	Oral Communication	COMM 101	3	
	Literature	ENGL 140-149	(3)	
	The Arts	ARTS 100-149	(3)	
Citizenship	History	HIST 100-149	(3)	
	Intercultural	FREN/GERM/SPAN 100-level or Study Abroad††	(3)	
	Global Connections	ECON 150-199; GEOG 150-199; HIST 150-199; PS 150-199; SOC 150-199	(3)	
Quantitative & Scientific Reasoning	SBM Quantitative Reasoning	MATH 120 <sup>†</sup> or higher level	-	
	SBM Scientific Endeavor	NSCI 100	-	
	SBM Science in Context	NSCI 171-199	-	
	Human Beh. & Soc. Inst	ECON 111, 112; GEOG 101, 102; PS 101, PSYC 101, SOC 101	(3)	
Wisdom, Faith, & the Good Life	Introduction to Phil.	PHIL 101	(3)	
	Phil. Investigations	PHIL 170-199; MSB 287	(3)	
	Theology & Wisdom	THEO 150-159	(3)	
	Theology & the Good Life	THEO 160-169	(3)	
<b>Total Core Credits taken at King's</b>			<b>30</b>	

Foundational Mathematics, Science and Engineering Requirements		Credits
PHYS 113 <sup>2,CR</sup> Physics for Science & Engineering I		3
PHYS 113L Phys. for Sci. & Eng. I Lab		1
PHYS 114 <sup>PR</sup> Physics for Science & Engineering II		3
PHYS 114L <sup>PR</sup> Phys. for Sci. & Eng. II Lab		1
CHEM 113 <sup>2</sup> General Chemistry I		3
CHEM 113L General Chemistry I Lab		1
CHEM 114 <sup>PR</sup> General Chemistry II		3
CHEM 114L <sup>PR</sup> General Chemistry II Lab		1
MATH 129 Calculus I		4
MATH 130 <sup>PR</sup> Calculus II		4
MATH 231 <sup>PR</sup> Calculus III		4
MATH 237 <sup>PR</sup> Math Methods for Physical Sciences		3
MATH 238 <sup>PR</sup> Differential Equations		3
ENGR 150 Engineering Seminar		2
ENGR 250 <sup>PR</sup> System Design & Analysis		3
ENGR 250L <sup>PR</sup> System Design & Analysis Lab		1
CS 111 Programming for Science and Engineering		3
CS 111L Programming for Science and Eng. Lab		0
<b>Other Requirements</b>		
HCE 101 Holy Cross Experience		1
<b>Total Foundational Mathematics, Science and Engineering Requirements and Other Credits</b>		<b>44</b>

Physics Major Requirements		Credits
PHYS 231 <sup>PR</sup> Modern Physics		3
PHYS 231L <sup>PR</sup> Modern Physics Lab		1
PHYS 241 <sup>PR</sup> Statics		3
PHYS 242 <sup>PR</sup> Mechanics of Solids		3
PHYS 330 <sup>PR</sup> Classical Mech.		3
PHYS 350 <sup>PR</sup> Thermodynamics & Stat. Mechanics		3
PHYS 371 <sup>PR</sup> Electricity & Magnetism I		3
PHYS 440 <sup>PR</sup> Quantum Mechanics		3
PHYS 490 <sup>PR</sup> Senior Seminar		3
PHYS Elective*		-
<b>Total Physics Major Credits</b>		<b>25</b>
<b>General Information</b>		
<p>The 3+2 Physics-Mechanical Engineering Dual Degree Program is a collaboration with the University of Notre Dame and with Washington University in St. Louis. Students will spend three years at King's College taking mathematics, science, engineering, and general education CORE courses. Eligible students will then transfer to Notre Dame or Washington University for two years to complete engineering courses in their chosen field. Upon successful completion of the program, students will receive both a B.S. in Physics from King's College and a B.S. in Mechanical Engineering from either Notre Dame or WashU. (For more information, refer to the college catalog).</p>		

**Total Credits earned at King's College = 99**

**Notes:**

\* PHYS Elective required for the King's degree satisfied by any junior or senior level mechanical engineering course at Notre Dame or Washington University

# Physics – Mechanical Engineering Track

## 3+2 Dual Degree Engineering Program

### Suggested Sequence

A suggested course sequence of degree requirements is listed below. Refer to the college catalog for course titles, descriptions, and prerequisites. Always consult your Academic Advisor when planning and scheduling your classes.

King's College			
Fall	Credits	Spring	Credits
CHEM 113 <sup>2</sup> Gen. Chem. I	3	CHEM 114 <sup>PR</sup> Gen. Chem. II	3
CHEM 113L Gen. Chem. I Lab	1	CHEM 114L <sup>PR</sup> Gen. Chem. II Lab	1
PHYS 113 <sup>2,CR</sup> Physics for Scientists & Engineers I	3	PHYS 114 <sup>PR</sup> Physics for Scientists & Engineers II	3
PHYS 113L Physics for Sci. & Eng. I Lab	1	PHYS 114L <sup>PR</sup> Physics for Sci. & Eng. II Lab	1
MATH 129 Calculus I	4	ENGR 150 Engineering Seminar	2
Core Course <sup>1</sup>	3	MATH 130 <sup>PR</sup> Calculus II	4
HCE 101 Holy Cross Experience	1	Core Course <sup>1</sup>	3
	<b>16</b>		<b>17</b>
Fall	Credits	Spring	Credits
PHYS 231 <sup>PR</sup> Modern Physics	3	PHYS 330 <sup>PR</sup> Classical Mech.	3
PHYS 231L <sup>PR</sup> Modern Physics Lab	1	PHYS 241 <sup>PR</sup> Statics	3
MATH 231 <sup>PR</sup> Calculus III	4	ENGR 250 <sup>PR</sup> System Design & Analysis	3
MATH 238 <sup>PR</sup> Differential Equations	3	ENGR 250L <sup>PR</sup> Syst. Design & Analysis Lab	1
CS 111 Programming for Sci. and Eng.	3	MATH 237 <sup>PR</sup> Math Methods for Phys. Sci.	3
CS 111L Prog. for Sci. and Eng. Lab	0	Core Course <sup>1</sup>	3
Core Course <sup>1</sup>	3		
	<b>17</b>		<b>16</b>
Fall	Credits	Spring	Credits
PHYS 371 <sup>PR</sup> Electricity & Magnetism I	3	PHYS 242 <sup>PR</sup> Mechanics of Solids	3
PHYS 350 <sup>PR</sup> Thermo/Stat. Mech.	3	PHYS 440 <sup>PR</sup> Quantum Mech.	3
Core Course <sup>1</sup>	3	PHYS 490 <sup>PR</sup> Senior Seminar	3
Core Course <sup>1</sup>	3	Core Course <sup>1</sup>	3
Core Course <sup>1</sup>	3	Core Course <sup>1</sup>	3
	<b>15</b>	Core Course <sup>1</sup>	3
			<b>18*</b>

**Total Credits earned at King's College = 99**

Students apply for transfer admission to the University of Notre Dame or Washington University in St. Louis after completion of the Fall semester of their 3<sup>rd</sup> year. Students must have satisfied King's College academic guidelines, as well as the following general criteria:

- For Admission to the University of Notre Dame
  - Cumulative grade-point average (GPA) of at least 3.6 on a 4.0 scale.
  - Cumulative technical grade-point average of at least 3.6 on a 4.0 scale (all math, science and engineering courses)
  - GPA must be maintained through Spring Semester of Year 3
  - All grades that transfer to Notre Dame must be a "B" or higher, and grades for all courses taken at King's must be a C or higher
  - At least 60 credit-hours of work that can be transferred to satisfy Notre Dame engineering and general education degree requirements
- For Admission to Washington University in St. Louis
  - Cumulative grade-point average (GPA) of at least 3.25 on a 4.0 scale.
  - Cumulative technical grade-point average of at least 3.25 on a 4.0 scale (all math, science and engineering courses)
  - GPA must be maintained through Spring Semester of Year 3
  - All grades that transfer to Washington University must be a "C" or higher
  - At least 60 credit-hours of work that can be transferred to satisfy WashU engineering and general education degree requirements
- The specific admission criteria for each school will be confirmed by the 3+2 Program Director

#### Notes:

PHYS 231, PHYS 350, PHYS 371 or PHYS 440 will satisfy Notre Dame's Technical Specialization/Professional Development requirement

PHYS 241 satisfies the Notre Dame requirement for AME 20221 Mechanics I

PHYS 242 satisfies the Notre Dame requirement for AME 20241 Solid Mechanics

PHYS 241 and PHYS 242 satisfies the WashU requirement for MEMS 253 Statics and Mechanics of Materials

PHYS 330 satisfies the Notre Dame requirement for AME 20222 Mechanics II and WashU requirement for MEMS 255 Dynamics

PHYS 350 satisfies the Notre Dame requirement for AME 20231 Thermodynamics and WashU requirement for MEMS 301 Thermodynamics

\*Students are encouraged to take summer courses to relieve the course load pressure during this semester.

<sup>1</sup>Choose one course from each of the Core Requirements listed on the reverse side.

<sup>2</sup>Course may satisfy both a Major and a Core requirement. CHEM 113 and PHYS 113 will satisfy the Scientific Endeavor and Science in Context Core requirements.

MATH 129 will satisfy the Quantitative Reasoning Core requirement.

<sup>PR</sup> Course has a prerequisite – check college catalog.

<sup>CR</sup> Course has a co-requisite – check college catalog.