

# Physics – Mechanical Engineering Track

3+2 Engineering Dual Degree Program with Notre Dame

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.
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 <sup>3</sup>	PHIL 170-199; MSB 287 <sup>3</sup>	(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>	

King's Major Requirements		Credits
PHYS 113 <sup>2,CR</sup> Physics for Sci. & Eng. I		3
PHYS 113L Phys. for Sci./Eng. I Lab		1
PHYS 114 <sup>PR</sup> Physics for Sci. & Eng. II		3
PHYS 114L <sup>PR</sup> Phys. for Sci./Eng. II Lab		1
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> Thermo/Stat. Mech.		3
PHYS 371 <sup>PR</sup> Electricity & Magnetism I		3
PHYS 440 <sup>PR</sup> Quantum Mech.		3
PHYS 490 <sup>PR</sup> Senior Seminar		3
PHYS Elective*		-
CHEM 113 <sup>2</sup> Gen. Chem. I		3
CHEM 113L Gen. Chem. I Lab		1
CHEM 114 <sup>PR</sup> Gen. Chem. II		3
CHEM 114L <sup>PR</sup> Gen. Chem. 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 Meth. for Phys. Sci.		3
MATH 238 <sup>PR</sup> Diff. Equations		3
ENGR 150 Engineering Seminar		2
ENGR 250 <sup>PR</sup> System Design & Analysis		3
ENGR 250L <sup>PR</sup> Syst. Design & Analysis Lab		1
CS 111 Programming for Sci. and Eng.		3
CS 111L Prog. for Sci. and Eng. Lab		0
<b>Other Requirements</b>		
HCE 101 Holy Cross Experience		1
<b>Total King's Major and Other Credits</b>		<b>69</b>

Notre Dame's Major Requirements		Credits
AME 20214 Intro to Eng. Computing		1
AME 20216 AME Lab I		1
AME 20217 AME Lab II		1
AME 21267 Design Tools I		2
AME 21268 Design Tools II		2
AME 20221 Mechanics I		-
AME 20222 Mechanics II		-
AME 20231 Thermodynamics		-
AME 20241 Solid Mechanics		-
AME 30314 Diff. Eq. Vib & Controls I		3
AME 30315 Diff. Eq. Vib & Controls II		3
AME 30331 Fluid Mechanics		3
AME 30334 Heat Transfer		3
AME 30362 Design Methodology		3
AME 30363 Design of Machine Elements		3
AME 40423 Mechanisms & Machines		3
AME 40463 Senior Design Project		4
AME Elective		3
AME Elective		3
AME Elective		3
AME Elective		3
CBE 30361 Materials Science		3
EE 20222 Intro to Electrical Eng.		4
Technical Elective		3
Technical Elective		-
A&L Course (King's Core Course)		3
A&L Course (King's Core Course)		3
A&L Course (King's Core Course)		3
<b>Total Notre Dame Credits</b>		<b>63</b>
<b>General Information</b>		
The 3-2 engineering program is a dual degree program. Students spend 3 years at King's College (King's) taking math, science and CORE courses and then transfer to Notre Dame (ND) for 2 years, focusing on engineering courses in their chosen field. Upon successful completion of the program at Notre Dame, students will receive <i>both</i> a B.S. in Physics from King's and a B.S. in Mechanical Engineering from Notre Dame. (For more information, refer to the college catalog).		

**Total Credits required for Graduation = 162**

# Physics – Mechanical Engineering Track

## 3+2 Dual Degree Engineering Program with Notre Dame

### 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 2019	Credits	Spring 2020	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 2020	Credits	Spring 2021	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 2021	Credits	Spring 2022	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>

Notre Dame			
Fall 2022	Credits	Spring 2023	Credits
AME 20214 Intro to Eng. Computing	1	AME 30315 Diff. Eq. Vib & Controls II	3
AME 30314 Diff. Eq. Vib & Controls I	3	AME 30334 Heat Transfer	3
AME 30331 Fluid Mechanics	3	AME 30363 Design of Machine Elements	3
AME 20216 AME Lab I	1	AME 20217 AME Lab II	1
AME 21267 Design Tools I	2	AME 21268 Design Tools II	2
CBE 30361 Materials Science	3	A&L Course (King's Core Course <sup>1</sup> )	3
A&L Course (King's Core Course <sup>1</sup> )	3		
	<b>16</b>		<b>15</b>
Fall 2023	Credits	Spring 2024	Credits
AME 30362 Design Methodology	3	AME 40463 Senior Design Project	4
AME 40423 Mechanisms & Machines	3	AME Elective	3
AME Elective	3	AME Elective	3
AME Elective	3	Technical Elective	3
EE 20222 Intro to Electrical Engineering	4	A&L Course (King's Core Course <sup>1</sup> )	3
	<b>16</b>		<b>16</b>

**Total Credits Required for Graduation = 162**

#### Notes:

The PHYS Elective required for the King's degree is satisfied by any of the 30000 or 40000 level AME courses

PHYS 231, PHYS 371 or PHYS 440 will satisfy one of Notre Dame's Technical Elective requirements

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

PHYS 330 satisfies the Notre Dame requirement for AME 20222 Mechanics II

PHYS 350 satisfies the Notre Dame requirement for AME 20231 Thermodynamics

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

\*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.