

# Physics – Systems Engineering Track

## 3+2 Engineering Dual Degree Program

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

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. (See college catalog for more information) 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 four (4) Core requirements at 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	(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>27</b>	

Foundational Mathematics, Science and Engineering Requirements		Credits
PHYS 113 <sup>2CR</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> Syst. Design & Analysis Lab		1
ENGR 300 Programming for Science and Engineering		3
ENGR 300L Programming for Science and Eng. Lab		1
CS 270 <sup>PR</sup> Computer Organization		3
CS 270L <sup>PR</sup> Computer Organization Lab		1
<b>Other Requirements</b>		
HCE 101 Holy Cross Experience		1
<b>Total Foundational Mathematics, Science and Engineering Requirements and Other Credits</b>		<b>49</b>

Physics Major Requirements		Credits
PHYS 231 <sup>PR</sup> Modern Physics		3
PHYS 231L <sup>PR</sup> Modern Physics Lab		1
PHYS 233 <sup>PR</sup> Electronics I		3
PHYS 233L <sup>PR</sup> Electronics I Lab		1
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*		-
PHYS Elective*		-
<b>Total Physics Major Credits</b>		<b>23</b>

**General Information**

The 3+2 Physics-Systems Engineering Dual Degree Program is a collaboration 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 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 Systems Engineering from WashU. (For more information, refer to the college catalog).

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

Notes:  
 \* PHYS Electives required for the King's degree satisfied by any junior or senior level electrical and systems engineering courses at Washington University

# Physics – Systems 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 233 <sup>PR</sup> Electronics	3
MATH 231 <sup>PR</sup> Calculus III	4	PHYS 233L <sup>PR</sup> Electronics I Lab	1
MATH 238 <sup>PR</sup> Differential Equations	3	ENGR 250 <sup>PR</sup> System Design & Analysis	3
ENGR 300 Programming for Sci. and Eng.	3	ENGR 250L <sup>PR</sup> Syst. Design & Analysis Lab	1
ENGR 300L Prog. for Sci. and Eng. Lab	1	MATH 237 <sup>PR</sup> Math Methods for Phys. Sci.	3
Core Course <sup>1</sup>	3	Core Course <sup>1</sup>	3
	<b>18*</b>		<b>17</b>
Fall	Credits	Spring	Credits
PHYS 371 <sup>PR</sup> Electricity & Magnetism I	3	PHYS 440 <sup>PR</sup> Quantum Mech.	3
PHYS 350 <sup>PR</sup> Thermo/Stat. Mech.	3	PHYS 490 <sup>PR</sup> Senior Seminar	3
Core Course <sup>1</sup>	3	CS 270 <sup>PR</sup> Computer Organization	3
Core Course <sup>1</sup>	3	CS 270L <sup>PR</sup> Computer Organization Lab	1
Core Course <sup>1</sup>	3	Core Course <sup>1</sup>	3
	<b>15</b>	Core Course <sup>1</sup>	3
			<b>16</b>

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

Students apply for transfer admission to 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 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:

The combination of MATH 231, 237 and 238 taken at King's satisfies the WashU requirements for ESE 318 Engineering Mathematics A and ESE 319 Engineering Mathematics B

\*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.