

# PHYSICS – MECHANICAL ENGINEERING TRACK

## 3+2 ENGINEERING DUAL DEGREE PROGRAM WITH NOTRE DAME

### COURSE REQUIREMENTS

| CORE Requirements   | Credits | King's Requirements                  | Credits | Notre Dame Requirements               | Credits |
|---|---------|--------------------------------------|---------|---------------------------------------|---------|
| CORE 090 First Yr Exp.  | 1       | PHYS 113 Physics for Sci. & Eng. I   | 3       | AME 20213 Measurements & Data Analy   | 4       |
| CORE 100 Lib Arts Sem.  | 3       | PHYS 113L Phys. for Sci./Eng. I Lab  | 1       | AME 20214 Intro to Eng. Computing     | 1       |
| CORE 110 Effect Writ.   | 3       | PHYS 114 Physics for Sci. & Eng. II  | 3       | AME 20221 Mechanics I                 | -       |
| CORE 115 or 116 Oral Comm.  | 3       | PHYS 114L Phys. for Sci./Eng. II Lab | 1       | AME 20222 Mechanics II                | -       |
| CORE 131 or 133 Civilization  | 3       | PHYS 231 Modern Physics              | 3       | AME 20231 Thermodynamics              | -       |
| CORE 140 or 141-145 Forgn.  | 3       | PHYS 231L Modern Physics Lab         | 1       | AME 20241 Solid Mechanics             | -       |
| CORE 150-159 Soc. Sci. <sup>1</sup>   | 3       | PHYS 241 Statics                     | 3       | AME 30314 Diff. Eq. Vib & Controls I  | 3       |
| CORE 160-164 Literature   | 3       | PHYS 242 Mechanics of Solids         | 3       | AME 30315 Diff. Eq. Vib & Controls II | 3       |
| CORE 170-179 The Arts   | 3       | PHYS 330 Classical Mech.             | 3       | AME 30331 Fluid Mechanics             | 3       |
| CORE 180-189 Amer. Studies <sup>1</sup>   | 3       | PHYS 350 Thermo/Stat. Mech.          | 3       | AME 30334 Heat Transfer               | 3       |
| CORE 190-199 Global Studies <sup>1</sup>  | 3       | PHYS 371 Electricity & Magnetism I   | 3       | AME 30361 CAD/CAM                     | 3       |
| CORE 250-259 Syst. Theology   | 3       | PHYS 440 Quantum Mech.               | 3       | AME 30362 Design Methodology          | 3       |
| CORE 260-269 Mor. Theology  | (3)     | PHYS 490 Senior Seminar              | 3       | AME 30363 Design of Machine Elements  | 3       |
| CORE 280 Philos. I  | (3)     | PHYS Elective                        | -       | AME 40423 Mechanisms & Machines       | 3       |
| CORE 281-289 Philos. II   | (3)     | CHEM 113 Gen. Chem. I                | 3       | AME 40463 Senior Design Project       | 4       |
| A student will need to complete three (3) of King's College CORE requirements at Notre Dame |         | CHEM 113L Gen. Chem. I Lab           | 1       | AME Elective                          | 3       |
|   |         | CHEM 114 Gen. Chem. II               | 3       | AME Elective                          | 3       |
|   |         | CHEM 114L Gen. Chem. II Lab          | 1       | AME Elective                          | 3       |
|   |         | MATH 129 Calculus I                  | 4       | AME Elective                          | 3       |
|   |         | MATH 130 Calculus II                 | 4       | CBE 30361 Materials Science           | 3       |
|   |         | MATH 231 Calculus III                | 4       | EE 20222 Intro to Electrical Eng.     | 4       |
|   |         | MATH 237 Applied Linear Algebra      | 3       | Technical Elective                    | 3       |
|   |         | MATH 238 Diff. Equations             | 3       | Technical Elective                    | -       |
|   |         | ENGR 150 Engineering Seminar         | 2       | A&L Course (King's CORE)              | 3       |
|   |         | ENGR 250 Intro to Eng. Systems       | 3       | A&L Course (King's CORE)              | 3       |
|   |         | ENGR 250L Eng Systems Lab            | 1       | A&L Course (King's CORE)              | 3       |
|   |         | CS 111 Prog. for Sci & Eng.          | 3       |                                       |         |
|   |         | CS 111L Prog. for Sci & Eng.Lab      | -       |                                       |         |
|   | 34      |                                      | 68      |                                       | 64      |

**Total Credits = 166**

**Note:** 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

<sup>1</sup>Students are required to take CORE 150, CORE 180 **OR** CORE 190 to fulfill the Interdisciplinary CORE requirement.

- If a student takes CORE 150, then he/she should choose from 181 – 188 to fulfill the 18x requirement AND from 191 – 198 to fulfill the 19x requirement.
- If a student takes CORE 180, then he/she should choose from 151 – 158 to fulfill the 15x requirement AND from 191 – 198 to fulfill the 19x requirement.
- If a student takes CORE 190, then he/she should choose from 151 – 158 to fulfill the 15x requirement AND from 181 – 188 to fulfill the 18x requirement.

#### General Information:

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. Admission into Notre Dame requires a minimum GPA of 3.30 after 5 semesters of college study. Students must earn at least 60 credits from ND to receive the ND degree. Upon successful completion of the program at Notre Dame, students will receive *both* 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.*)

# PHYSICS – MECHANICAL ENGINEERING TRACK

## 3+2 ENGINEERING DUAL DEGREE PROGRAM WITH NOTRE DAME

### SUGGESTED SEQUENCE

- Use the information below as a guide when selecting courses.
- Refer to the reverse side when selecting major courses, major electives, core courses, and free electives when applicable.
- Consult your Academic Advisor prior to course registration.
- Refer to the King’s College Catalog and/or website for course titles and descriptions.
- Choose one course from each CORE category as listed on the reverse side.
  - CORE courses may be taken in any order approved by the academic advisor with the following conditions:
    - CORE 100 and CORE 110 should be taken in the first year.
    - CORE 115 (or 116) should be taken within the first two years.
    - For students selecting a Foreign Language (CORE 14x), every effort should be made to register for that language in the first available semester at King’s.

| <b>King’s College</b>             |   |            |                                     |  |            |
|-----------------------------------|---|------------|-------------------------------------|--|------------|
| <b>1<sup>st</sup> Year - Fall</b> |   | cr.        | <b>1<sup>st</sup> Year - Spring</b> |  | cr.        |
| _____                             | CHEM 113 Gen. Chem. I                         | 3          | _____                               | CHEM 114 Gen. Chem. II                         | 3          |
| _____                             | CHEM 113L Gen. Chem. I Lab                    | 1          | _____                               | CHEM 114L Gen. Chem. II Lab                    | 1          |
| _____                             | PHYS 113 Physics for Scientists & Engineers I | 3          | _____                               | PHYS 114 Physics for Scientists & Engineers II | 3          |
| _____                             | PHYS 113L Physics for Sci. & Eng. I Lab       | 1          | _____                               | PHYS 114L Physics for Sci. & Eng. II Lab       | 1          |
| _____                             | MATH 129 Calculus I                           | 4          | _____                               | ENGR 150 Engineering Seminar                   | 2          |
| _____                             | CORE  | 3          | _____                               | MATH 130 Calculus II                           | 4          |
| _____                             | CORE 090 First Year Exp.                      | 1          | _____                               | CORE   | 3          |
|                                   |   | <b>16</b>  |                                     |  | <b>17</b>  |
| <b>2<sup>nd</sup> Year - Fall</b> |   |            | <b>2<sup>nd</sup> Year - Spring</b> |  |            |
| _____                             | PHYS 231 Modern Physics                       | 3          | _____                               | PHYS 330 Classical Mech.                       | 3          |
| _____                             | PHYS 231L Modern Physics Lab                  | 1          | _____                               | PHYS 241 Statics                               | 3          |
| _____                             | MATH 231 Calculus III                         | 4          | _____                               | ENGR 250 Intro to Engineering Systems          | 3          |
| _____                             | MATH 237 Applied Linear Algebra               | 3          | _____                               | ENGR 250L Engineering Systems Lab              | 1          |
| _____                             | CS 111 Prog. for Sci & Eng.                   | 3          | _____                               | MATH 238 Diff. Equations                       | 3          |
| _____                             | CS 111L Prog. for Sci & Eng.Lab               | 0          | _____                               | CORE   | 3          |
| _____                             | CORE  | 3          |                                     |  |            |
|                                   |   | <b>17</b>  |                                     |  | <b>16</b>  |
| <b>3<sup>rd</sup> Year - Fall</b> |   |            | <b>3<sup>rd</sup> Year - Spring</b> |  |            |
| _____                             | PHYS 371 Electricity & Magnetism I            | 3          | _____                               | PHYS 440 Quantum Mech.                         | 3          |
| _____                             | PHYS 350 Thermo/Stat. Mech.                   | 3          | _____                               | PHYS 242 Mechanics of Solids                   | 3          |
| _____                             | CORE  | 3          | _____                               | PHYS 490 Senior Seminar                        | 3          |
| _____                             | CORE  | 3          | _____                               | CORE   | 3          |
| _____                             | CORE  | 3          | _____                               | CORE   | 3          |
| _____                             | CORE  | 3          | _____                               | CORE   | 3          |
|                                   |   | <b>18*</b> |                                     |  | <b>18*</b> |

| <b>Notre Dame</b>                 |  |           |                                     |  |           |
|-----------------------------------|--|-----------|-------------------------------------|--|-----------|
| <b>4<sup>th</sup> Year - Fall</b> |  |           | <b>4<sup>th</sup> Year - Spring</b> |  |           |
| _____                             | AME 20214 Intro to Eng. Computing        | 1         | _____                               | AME 20213 Measurements & Data Analysis | 4         |
| _____                             | 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 30361 CAD/CAM                        | 3         | _____                               | AME 30363 Design of Machine Elements   | 3         |
| _____                             | CBE 30361 Materials Science              | 3         | _____                               | A&L Course (King’s CORE)               | 3         |
| _____                             | A&L Course (King’s CORE)                 | 3         |                                     |  |           |
|                                   |  | <b>16</b> |                                     |  | <b>16</b> |
| <b>5<sup>th</sup> Year - Fall</b> |  |           | <b>5<sup>th</sup> Year - Spring</b> |  |           |
| _____                             | 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)               | 3         |
|                                   |  | <b>16</b> |                                     |  | <b>16</b> |

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