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|------------------------------------|---|---------------------------|--|
| PROGRAM CODE ULASPHYEP | COLLEGE OF LIBERAL ARTS AND SCIENCES | | |
| EFFECTIVE DATE FALL 2020 | PHYSICS | | |
| VERSION NUMBER 2208 | <i>BACHELOR OF SCIENCE</i> | | |
| ENGINEERING PHYSICS TRACK | | | |
| STUDENT: | | STUDENT ID NUMBER: | |

MAJOR PROGRAM

| Common Core | | |
|-------------------------|-----------|-------|
| COURSE | CR | GRADE |
| PHY 100: PHYSICS I | 4 | |
| PHY 102: PHYSICS II | 4 | |
| PHY 212: MODERN PHYSICS | 3 | |
| PHY 220: ELECTRONICS | 3 | |
| PHY 230: OPTICS | 3 | |
| PHY 315: ADVANCED LAB | 2 | |
| PHY 380: SENIOR SEMINAR | 2 | |
| TOTAL CREDITS | 21 | |

| Engineering Physics Track (Required) | | |
|---|-----------|-------|
| COURSE | CR | GRADE |
| EGR 121: ENGINEERING DRAWING AND DESIGN | 3 | |
| EGR 130: ENGINEERING MECHANICS | 3 | |
| EGR 230: STRENGTH OF MATERIALS | 3 | |
| EGR 330: FLUID MECHANICS | 3 | |
| PHY 245: MATHEMATICAL PHYSICS I | 3 | |
| PHY 312: CLASSICAL MECHANICS I | 3 | |
| PHY 316: ELECTROMAGNETISM I | 3 | |
| PHY 327: THERMO. AND STAT. MECH. | 3 | |
| TOTAL CREDITS | 24 | |

| Engineering Physics Track (Electives) | | |
|--|----------|-------|
| STUDENTS MUST DISCUSS WITH THEIR ADVISORS WHICH ELECTIVES WOULD BEST SERVE THEIR FUTURE CAREER GOALS BEFORE CHOOSING THEM. | | |
| CHOOSE AT LEAST ONE (3 CREDITS) | CR | GRADE |
| EGR 370: RESEARCH IN ENGINEERING | 3 | |
| PHY 214: INTRO. TO SUBATOMIC PHYSICS | 3 | |
| PHY 250: PROGRAMMING FOR EXP. RESEARCH & INDUSTRY | 3 | |
| PHY 290: INTRO. TO NANOTECHNOLOGY | 3 | |
| PHY 340: COMPUTATIONAL PHYSICS | 3 | |
| PHY 350: INSTRUMENTATION IN PHYSICS | 3 | |
| TOTAL CREDITS | 3 | |


CONCOMITANT COURSES

| Chemistry | | |
|--------------------------------|-----------|-------|
| COURSE | CR | GRADE |
| CHM 100: GENERAL CHEMISTRY I | * | |
| CHM 102: GENERAL CHEMISTRY II | 4 | |
| Mathematics | | |
| MAT 181: CALCULUS I | * | |
| MAT 182: CALCULUS II | 4 | |
| MAT 283: CALCULUS III | 4 | |
| Biology | | |
| BIO 104: PRINCIPLES OF BIOLOGY | * | |
| TOTAL CREDITS | 12 | |

| Free Electives <i>CHOOSE ANY COURSES THAT COUNT TOWARD GRADUATION</i> | | |
|--|-----------|-------|
| COURSE | CR | GRADE |
| | 3 | |
| | 3 | |
| | 3 | |
| | 3 | |
| | 3 | |
| TOTAL CREDITS | 15 | |

NOTE:

* REQUIRED FOR THE MAJOR. SATISFIES GENERAL EDUCATION REQUIREMENT OF UNDERSTANDING SCIENCE AND TECHNOLOGY

| GRADUATION REQUIREMENTS | | | | | | |
|--|---------------------------|--------------|---|----------------------|-------------|---|
|  | | REQUIRED | ✓ | | REQUIRED | ✓ |
| | GENERAL EDUCATION CREDITS | 42-45 | | COMPREHENSIVE EXAM | PASS | |
| | PROGRAM CREDITS (MINIMUM) | 60 | | MINIMUM QPA OVERALL | 2.0 | |
| | FREE ELECTIVE CREDITS | 15 | | MINIMUM QPA IN MAJOR | 2.0 | |
| | TOTAL CREDITS | 120 | | | | |

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|-----------|-----------------------------------|
| NAME | EFFECTIVE DATE AUGUST 27, 2018 |
| ID NUMBER | VERSION 2188 |

KUTZTOWN

UNIVERSITY

DEGREE REQUIREMENTS

GENERAL EDUCATION

Student Learning Outcomes (SLO)

Upon completion of the requirements for the General Education Program, students will be able to:

- 1 communicate clearly and effectively orally and in writing.
- 2 apply scientific and quantitative reasoning to solve problems and increase knowledge.
- 3 apply skills in critical analysis and reasoning for the interpretation of data.
- 4 engage critically with creative or artistic works.
- 5 demonstrate the ability to retrieve, interpret, evaluate, and use information.
- 6 analyze the role of values, ethics, diversity, and multiple perspectives in local and global society.
- 7 demonstrate an understanding of various models for the development of the whole person.

Completion of the KU General Education program will give students opportunities to:

- 8 explore concepts, ideas, and methods from a variety of disciplines.

Use this checksheet to plan your degree program. Meet every semester with your academic advisor to be sure that you are taking courses that are required to obtain the degree you are seeking. Discuss your goals and choose courses that will help you to attain them. Get the most out of your education by taking advantage of everything that Kutztown University has to offer.

TOTAL GENERAL EDUCATION CREDITS 42-45

FIND A FULL EXPLANATION OF THE GENERAL EDUCATION PROGRAM AT WWW.KUTZTOWN.EDU

| | | |
|--|------------------|----------|
| First Year Seminar: Discovering College | CREDITS REQUIRED | 3 |
| THIS COURSE MEETS SLO 5 & 7 | CREDITS EARNED: | |

| COURSE NUMBER | COURSE NAME | CR | GR |
|---------------|--------------------|----|----|
| FYS 100 | First Year Seminar | | |

TRANSFER STUDENTS TRANSFERRING 15 CREDITS OR MORE AND NOT TRANSFERRING AN FYS OR FYE COURSE MAY SELECT ANY ADDITIONAL COURSE FROM SECTIONS A, B, C, OR D TO MEET THEIR FYS REQUIREMENT

TRANSFER ELECTIVE:

| | | | |
|------------------------------|---|------------------|-----------|
| A | Communicating With And About the World | CREDITS REQUIRED | 12 |
| THESE COURSES MEET SLO 1 & 5 | | CREDITS EARNED: | |

| COURSE NUMBER | COURSE NAME | CR | GR |
|---------------|--|----|----|
| 1 | COMPOSITION 100 LEVEL CMP 1__ | | |
| 2 | COMPOSITION 200 LEVEL CMP 2__ | | |
| 3 | SPEAKING | | |
| 4 | ANY WRITING (A2) OR SPEAKING COURSE (A3) OR FROM THE APPROVED LIST | | |

COURSES IN CATEGORIES B, C & D MUST BE TAKEN OUTSIDE THE STUDENT'S MAJOR. THE MAJOR IS DEFINED AS THE PREFIX THAT IDENTIFIES THE MAJOR. CONCOMITANT REQUIREMENTS MAY BE TAKEN TO MEET GENERAL EDUCATION REQUIREMENTS.

| | | | |
|------------------------------|--|------------------|----------|
| B | Understanding Self & Others | CREDITS REQUIRED | 9 |
| THESE COURSES MEET SLO 3 & 6 | | CREDITS EARNED: | |

| COURSE NUMBER | COURSE NAME | CR | GR |
|---------------|-------------|----|----|
| 1 | | | |
| 2 | | | |
| 3 | | | |

| | | | |
|------------------------------|---|------------------|-------------|
| C | Understanding Science & Technology | CREDITS REQUIRED | 9-12 |
| THESE COURSES MEET SLO 2 & 3 | | CREDITS EARNED: | |

| COURSE NUMBER | COURSE NAME | CR | GR |
|---------------|----------------------------------|----|----|
| 1 | SCIENTIFIC INQUIRY | | |
| 2 | QUANTITATIVE REASONING | | |
| 3 | ANY COURSE APPROVED FOR C1 OR C2 | | |

| | | | |
|------------------------------|---|------------------|----------|
| D | Understanding & Creating Ideas | CREDITS REQUIRED | 9 |
| THESE COURSES MEET SLO 4 & 6 | | CREDITS EARNED: | |

| COURSE NUMBER | COURSE NAME | CR | GR |
|---------------|-------------|----|----|
| 1 | | | |
| 2 | | | |
| 3 | | | |

B.S. in Physics (Engineering Physics) – Four-Year Plan¹

(This document should *not* be considered as a substitute for the official program check sheet or a comprehensive discussion with your advisor. Also please refer to the program check sheet for all the footnotes, other guidelines, and requirements.)

First Year

| Fall | | | Spring | | |
|-----------|---------------------------|---------|-----------|-----------------------------|---------|
| Number | Title | Credits | Number | Title | Credits |
| PHY 100 | Physics I | 4 | PHY 102 | Physics II | 4 |
| MAT 181 | Calculus I | 4 | MAT 182 | Calculus II | 4 |
| CHM 100 | General Chemistry I | 4 | CHM 102 | General Chemistry II | 4 |
| FYS 100 | <i>First Year Seminar</i> | 3 | | <i>Gen. Ed. or Elective</i> | 3 |
| 15 | | | 15 | | |

Second Year

| Fall | | | Spring | | |
|-----------|------------------------|---------|-----------|-----------------------------|---------|
| Number | Title | Credits | Number | Title | Credits |
| PHY 220 | Electronics | 3 | PHY 230 | Optics | 3 |
| PHY 245 | Mathematical Physics I | 3 | PHY 312 | Classical Mechanics I | 3 |
| EGR 121 | Engineering Drawing | 3 | EGR 230 | Strength of Materials | 3 |
| EGR 130 | Engineering Mechanics | 3 | | <i>Gen. Ed. or Elective</i> | 3 |
| MAT 283 | Calculus III | 4 | | <i>Gen. Ed. or Elective</i> | 3 |
| 16 | | | 15 | | |

Third Year

| Fall | | | Spring | | |
|-----------|-----------------------------|---------|-----------|-----------------------------|---------|
| Number | Title | Credits | Number | Title | Credits |
| PHY 212 | Modern Physics | 3 | PHY 327 | Thermo. & Stat. Mech. | 3 |
| PHY 316 | Electromagnetism I | 3 | EGR 330 | Fluid Mechanics | 3 |
| | <i>Gen. Ed. or Elective</i> | 3 | | <i>Gen. Ed. or Elective</i> | 3 |
| | <i>Gen. Ed. or Elective</i> | 3 | | <i>Gen. Ed. or Elective</i> | 3 |
| | <i>Gen. Ed. or Elective</i> | 3 | | <i>Gen. Ed. or Elective</i> | 3 |
| 15 | | | 15 | | |

Fourth Year

| Fall | | | Spring | | |
|-----------|-----------------------------|---------|-----------|-----------------------------|---------|
| Number | Title | Credits | Number | Title | Credits |
| PHY 380 | Senior Seminar | 2 | PHY 315 | Advanced Lab | 2 |
| BIO 104 | Principles of Biology | 4 | | <i>Gen. Ed. or Elective</i> | 3 |
| | <i>Gen. Ed. or Elective</i> | 3 | | <i>Gen. Ed. or Elective</i> | 3 |
| | <i>Gen. Ed. or Elective</i> | 3 | | <i>Gen. Ed. or Elective</i> | 3 |
| | <i>Gen. Ed. or Elective</i> | 3 | | <i>Gen. Ed. or Elective</i> | 3 |
| 15 | | | 14 | | |

Gen. Ed. and Electives

| | |
|------------------------------------|--|
| A.1 | |
| A.2 | |
| A.3 | |
| A.4 | |
| B.1 | |
| B.2 | |
| B.3 | |
| D.1 | |
| D.2 | |
| D.3 | |
| Free Elective | |
| Free Elective | |
| Free Elective | |
| Free Elective | |
| Free Elective | |
| Engineering Physics Track Elective | |

¹Courses in the Physics major are front-loaded in this plan. It is designed with two groups of students in mind:

- Those who wish to go to graduate school in physics and want to complete most of the physics curriculum before taking the GRE-Physics Test in the Fall semester of their senior year
- Those who switch to Physics and wish to complete the major's courses in less than four years (assuming they have many gen. ed. and concomitant courses at the time of switch)

Others who wish to complete the required courses at a more even pace are urged to discuss a suitable course plan with their advisor.

B.S. in Physics / Engineering Physics²

(This document should *not* be considered as a substitute for the official program check sheet or a comprehensive discussion with your advisor. Also please refer to the program check sheet for all the footnotes, other guidelines, and requirements.)

First Year

| Fall | | | Spring | | |
|-----------|---------------------------|---------|-----------|-----------------------------|---------|
| Number | Title | Credits | Number | Title | Credits |
| PHY 100 | Physics I | 4 | PHY 102 | Physics II | 4 |
| MAT 181 | Calculus I | 4 | MAT 182 | Calculus II | 4 |
| CHM 100 | General Chemistry I | 4 | CHM 102 | General Chemistry II | 4 |
| FYS 100 | <i>First Year Seminar</i> | 3 | | <i>Gen. Ed. or Elective</i> | 3 |
| 15 | | | 15 | | |

Second Year

| Fall | | | Spring | | |
|-----------|-----------------------------|---------|-----------|-----------------------------|---------|
| Number | Title | Credits | Number | Title | Credits |
| PHY 245 | Mathematical Physics I | 3 | PHY 230 | Optics | 3 |
| EGR 121 | Engineering Drawing | 3 | PHY 312 | Classical Mechanics I | 3 |
| EGR 130 | Engineering Mechanics | 3 | EGR 230 | Strength of Materials | 3 |
| MAT 283 | Calculus III | 4 | | <i>Gen. Ed. or Elective</i> | 3 |
| | <i>Gen. Ed. or Elective</i> | 3 | | <i>Gen. Ed. or Elective</i> | 3 |
| 16 | | | 15 | | |

Third Year

| Fall | | | Spring | | |
|-----------|-----------------------------|---------|-----------|-----------------------------|---------|
| Number | Title | Credits | Number | Title | Credits |
| PHY 212 | Modern Physics | 3 | PHY 327 | Thermo. & Stat. Mech. | 3 |
| PHY 220 | Electronics | 3 | EGR 330 | Fluid Mechanics | 3 |
| | <i>Gen. Ed. or Elective</i> | 3 | | <i>Gen. Ed. or Elective</i> | 3 |
| | <i>Gen. Ed. or Elective</i> | 3 | | <i>Gen. Ed. or Elective</i> | 3 |
| | <i>Gen. Ed. or Elective</i> | 3 | | <i>Gen. Ed. or Elective</i> | 3 |
| 15 | | | 15 | | |

Fourth Year

| Fall | | | Spring | | |
|-----------|-----------------------------|---------|-----------|-----------------------------|---------|
| Number | Title | Credits | Number | Title | Credits |
| PHY 316 | Electromagnetism I | 3 | PHY 315 | Advanced Lab | 2 |
| PHY 380 | Senior Seminar | 2 | BIO 104 | Principles of Biology | 4 |
| | <i>Gen. Ed. or Elective</i> | 3 | | <i>Gen. Ed. or Elective</i> | 3 |
| | <i>Gen. Ed. or Elective</i> | 3 | | <i>Gen. Ed. or Elective</i> | 3 |
| | <i>Gen. Ed. or Elective</i> | 3 | | <i>Gen. Ed. or Elective</i> | 3 |
| 14 | | | 15 | | |

Gen. Ed. and Electives

| | |
|------------------------------------|--|
| A.1 | |
| A.2 | |
| A.3 | |
| A.4 | |
| B.1 | |
| B.2 | |
| B.3 | |
| D.1 | |
| D.2 | |
| D.3 | |
| Free Elective | |
| Free Elective | |
| Free Elective | |
| Free Elective | |
| Free Elective | |
| Engineering Physics Track Elective | |

²Courses in the Physics major are distributed more uniformly over the four years in this plan. However, those who wish to take the GRE-Physics test in the Fall semester of their fourth year are encouraged to follow the expedited plan.