

# CURRICULUM: Bachelor of Science in Industrial Engineering (BSIE)

*general engineering*

## FRESHMAN YEAR

| Fall Semester         |   | Credits   |
|-----------------------|---|-----------|
| CH101                 | Chemistry, A Molecular Science <sup>1</sup>         | 3         |
| CH102                 | General Chemistry Lab <sup>1</sup>                  | 1         |
| E101                  | Intro to Engineering & Problem Solving <sup>1</sup> | 1         |
| E115                  | Intro to Computing Environments                     | 1         |
| ENG101                | Academic Writing and Research <sup>1</sup>          | 4         |
|                       | Calculus I <sup>1</sup>                             | 4         |
| PE10 *                | Fitness and Wellness Course *                       | 1         |
| <b>Total Credits:</b> |   | <b>15</b> |

| Spring Semester       |   | Credits   |
|-----------------------|---|-----------|
|                       | GEP Requirement *                                   | 3         |
| EC205                 | Economics (or EC201 or ARE201 *)                    | 3         |
| MA241                 | Calculus II <sup>1</sup>                            | 4         |
| PY205                 | Physics for Engineers and Scientists I <sup>1</sup> | 4         |
| E102                  | Engineering in the 21st Century                     | 2         |
|                       | Physical Ed/Healthy Living Elective *               | 1         |
| <b>Total Credits:</b> |   | <b>17</b> |

*become an Excel guru and study BIG DATA*

## SOPHOMORE YEAR

| Fall Semester         |   | Credits   |
|-----------------------|---|-----------|
| ISE110                | Computer Modeling and Engineers <sup>6</sup>  | 3         |
| MSE200                | Mechanical Properties of Structural Materials | 3         |
| MA242                 | Calculus III                                  | 4         |
| PY208                 | Physics for Engineers and Scientists II       | 4         |
| ST371                 | Intro to Probability & Distribution Theory    | 3         |
| <b>Total Credits:</b> |   | <b>17</b> |

| Spring Semester       |   | Credits   |
|-----------------------|---|-----------|
| ECE331                | Principles of Electrical Engineering      | 3         |
| ISE216                | Product Development & Rapid Prototyping   | 3         |
| MA303                 | Linear Analysis                           | 3         |
| ISE215                | Product Specification I                   | 1         |
| ST372                 | Intro to Stat Inference & Regression      | 3         |
|                       | Engineering Science Elective <sup>3</sup> | 3         |
| <b>Total Credits:</b> |   | <b>16</b> |

*learn about product development*

*make cool stuff*

## JUNIOR YEAR

| Fall Semester         |  | Credits   |
|-----------------------|--|-----------|
| ENG331                | Technical Writing                      | 3         |
| ISE316                | Manufacturing Engineering I: Processes | 3         |
| ISE315                | Product Specification II               | 1         |
| ISE441                | Intro to Simulation                    | 3         |
| ISE361                | Deterministic Models in IE             | 3         |
|                       | Ethics (GEP Requirement *)             | 3         |
| <b>Total Credits:</b> |  | <b>16</b> |

| Spring Semester       |                                 | Credits   |
|-----------------------|---------------------------------|-----------|
| ISE352                | Work Analysis & Design          | 3         |
| ISE362                | Stochastic Models in IE         | 3         |
| ISE443                | Quality Control                 | 3         |
|                       | Technical Elective <sup>7</sup> | 3         |
| CE214                 | Engineering Mechanics - Statics | 3         |
| <b>Total Credits:</b> |                                 | <b>15</b> |

*Design safe and efficient processes*

*build a model of patients in a hospital*

*stop bad products before they ship*

*optimize supply chains*

## SENIOR YEAR

| Fall Semester         |  | Credits   |
|-----------------------|--|-----------|
| ENG311                | Engineering Economic Analysis                          | 3         |
| ISE408                | Control of Production & Service Systems                | 3         |
|                       | / Technical Elective <sup>7</sup> / Healthcare Systems | 3         |
| ISE520                | Performance Improvement I <sup>8</sup>                 | 3         |
| ISE453                | Production Systems Design                              | 3         |
|                       | GEP Requirement *                                      | 3         |
| <b>Total Credits:</b> |  | <b>15</b> |

| Spring Semester       |  | Credits      |
|-----------------------|--|--------------|
| ISE498 / ISE521       | Senior Design Project / Healthcare Systems Performance Improvement II <sup>8</sup> | 3            |
|                       | Technical Elective <sup>7</sup>  | 3            |
|                       | GEP Requirement *  | 3            |
|                       | GEP Requirement *  | 3            |
|                       | GEP Requirement *  | 2-3          |
| <b>Total Credits:</b> |  | <b>14-15</b> |

*Work on an industry project*

*design a facility*

**Minimum Credit Hours Required for Graduation:**

**124**

## Major/Program Requirements and Footnotes

<sup>1</sup> For matriculation, courses must be completed with a grade of C or higher.

<sup>2</sup> Must be completed with a grade of C- or higher.

<sup>3</sup> Engineering science electives: CE 215, CE 313, MAE 208, MAE 314, MAE 301 or MAE 308.

<sup>4</sup> Ethics elective: IDS 201, IDS 303, STS 214, STS 302, STS 304, STS 322, or STS 325.

<sup>5</sup> Graduation requirements include: (a) 2.0 overall GPA, or higher, on all courses attempted at NCSU, and (b) a GPA of 2.0 or higher in the major (all courses bearing the ISE-designation) OR a grade of C- or higher in each ISE course used to satisfy the requirements in the major.

<sup>6</sup> ISE/TE 110 must be completed with a C or better.

<sup>7</sup> Technical electives include: ISE 416, ISE 417, ISE 452, ISE 462, ISE 495, MSE 465, MSE 445, MSE 485, ST 430 and ST 431.

<sup>8</sup> To earn a Health Systems Engineering Certificate, students will take ISE 520 as a technical elective and ISE 521 instead of ISE498.

\* General Education Program (GEP) requirements: To complete the requirements for graduation and the General Education Program, the following credit hours and co-requisites must be satisfied. University approved GEP course lists for each category can be found at <https://oucc.dasa.ncsu.edu/general-education-program-gep/gep-course-lists-2/>.

PHYSICAL EDUCATION – 2 hours to be selected from the approved GEP Physical Education list.

- One fitness and wellness course (any PE 100-level course).
- One additional credit hour of PE activity courses.

HUMANITIES – 6 credits to be selected in two different disciplines (two different course prefixes) from the approved GEP Humanities list.

SOCIAL SCIENCES – 3 credits to be selected in a discipline other than economics from the approved GEP Social Sciences list. EC 205 taken as part of the Major requirements satisfies 3 credit hours of the 6 credit hours needed to fulfill the GEP Social Sciences requirement.

ADDITIONAL BREADTH – 3 credits to be selected from the approved GEP Humanities, Social Sciences or Visual and Performing Arts lists.

INTERDISCIPLINARY PERSPECTIVES – 5 credits to be selected from the approved GEP Interdisciplinary Perspectives list. Ethics course taken as part of the Major requirements satisfies 3 credit hours of the 5-6 credit hours needed to fulfill the GEP Interdisciplinary Perspectives requirement.

Co-requisites: U.S. Diversity and Global Knowledge co-requisites must be satisfied to complete the General Education requirements. Choose course(s) that are identified on the approved GEP course lists as meeting the U.S. Diversity and Global Knowledge co-requisites.

Foreign Language proficiency at the FL\_102 level will be required for graduation.