_____ **B.S.E. in BIOENGINEERING** (128 credits) Date _____

ID _____ **Fall 2017** Catalog Year Curriculum Sheet

**DEARBORN DISCOVERY CORE (DDC) Requirements** 21

**WRITTEN AND ORAL COMM.** (6 credits)
***Composition Placement Exam required***
COMP 105 (3) and
COMP 270 (3)
*Both required if not taken to fulfill DDC Written and Oral Communication*

**HUMANITIES AND THE ARTS** (6 credits)
See DDC approved list in Degree Works or
HTTPS://APP.SMARTSHEET.COM/B/PUBLISH?EQBCT=DAFF687F800B4FE89910A9CEA66B1627

**SOCIAL AND BEH. ANALYSIS** (9 credits)
ECON 201 or ECON 202 (3 cr) is REQUIRED
*If not taken in fulfillment of DDC Soc. and Beh. Analysis*

Other (6 credits) must be chosen from DDC approved list in Degree Works or
HTTPS://APP.SMARTSHEET.COM/B/PUBLISH?EQBCT=DAFF687F800B4FE89910A9CEA66B1627

**INTERSECTIONS**
IMSE 421 taken as 3 credits of Upper-level Tech Electives fulfills one Intersections course (3 cr)

Certain ANTH, HIST, POL and SOC classes can fulfill both an Intersections requirement and a Social & Beh. Analysis requirement.
Certain ARTH classes can fulfill both an Intersections and a Humanities & Arts requirement (3 cr).

Prerequisites apply. See list for courses that fulfill both requirements:
HTTPS://APP.SMARTSHEET.COM/B/PUBLISH?EQBCT=DAFF687F800B4FE89910A9CEA66B1627

**Important DDC Notes:**

- DDC requirements apply to Freshmen admitted fall 2015 and later, and to Transfers admitted fall 2017 and later.
- Many DDC courses fulfill multiple categories. However, a single DDC course may be used for a **maximum of three** DDC categories
- BENG students MUST graduate with a minimum **128 credits**

**BASIC PREP Requirements** 61

**INTRO to ENGINEERING**
ENGR 100 (2 credits)

**ENGINEERING GRAPHICS**
ENGR 126 (2)

**MATHEMATICS** – 5 courses (16)
(***Fulfills DDC Quant. Thinking)***
MATH 115 (4) *Calculus I*
MATH 116 (4) *Calculus II*
MATH 205 or 215 (3) *Calculus III*
MATH 216 (3) *Diff Equations*
MATH 217 or 227 (2) *Matrix/Linear Algebra*

**CHEMISTRY I and II** (8)
CHEM 134 or 144 (4)
CHEM 136 or 146 (4)

**BIOLOGY** (8 credits)
BIOL 103 (4) *Anatomy & Physiology*
BIOL 140 (4) *Molecular & Cellular Bio*

**PHYSICS I and II** (8)
***(Fulfills DDC Natural Sciences)***
PHYS 150 (4)
PHYS 151 (4)

**ENGIN BASIC COURSES** (17 credits)
ENGR 250 (3) *Enginreering Materials*
ENGR 216 (2) *Computer Methods*
ME 230 (4) *Thermodynamics*
ME 265 (4) *Applied. Mechanics*
ECE 305 (4) *Intro Electrical Engr.*

**See separate curriculum sheet for information on the optional concurrent BSE degree in Mechanical and Bioengineering. The concurrent degree requires additional 15 credits**

**Consult the pre-med advisor for the list of courses recommended to students preparing for medical school admission**

** **Beware NO-CREDIT courses**. **
NO-CREDIT listed at end of CECS Handbook:
https://umich.app.box.com/s/6a5c4j9hwlctnppzy7o2xjmvlrtumvoj

**PROFESSIONAL Requirements** 46

**BIOENGINEERING CORE** – 7 courses (27)
BENG 325 (4) *Thermal Fluid Sciences for Bioengineering*
BENG 351 (4) *Bio-sensors & Instruments*
BENG 370 (4) *Biomechanics I*
BENG 364 (3) *Prob & Stat in Bioeng*
BENG 375 (4) *Biomaterials, Tissue Engr.*
BENG 381 (4) *Bioprocessing*
BENG 4671 (4) *Senior Design*
***(Fulfills DDC Upper-Level Writing; Critical Thinking; & Capstone Experience)***

**BIOENGINEERING ELECTIVES** (19)
19 credits of upper-level technical elective courses from lists below. At least one course must be a design elective course (3 or 4 credits)

**DESIGN ELECTIVES** (at least one)
BENG 426 (4) *Fund. of Drug Delivery*
BENG 451 (3) *Microfluidic & Biomedical Microdevices*
BENG 460 (4) *Nanobiosystems Engineering*
BENG 470 (3) *Biomechanics II*
BENG 481 (3) *Biomimetic Engineering*
IMSE 4675 (4) *Six Sigma & Statistical Process Improvement*
IMSE 4425 (4) *Human Factors Ergonomics*
ME 3601 (4) *Design & Analysis of Machine Elements*
BENG 490 (1-3) *Directed Design project*

**OTHER TECH ELECTIVES**
BENG 410 (3) *Bio-Informatics*
BENG 425 (3) *Transport in Biosystems*
BENG 475 (3) *Regenerative Engineering*
CHEM 437 (3) *Nano-Biotechnology*
CHEM 395 (3) *Molecular Nanotechnology*
ENGR 350 (4) *Nanotechnology*
ME 410 (3) *Finite Element Method*
ME 442 (4) *Control Systems Analysis*
IMSE 421 (3) *Engin Econ/Decision Analys*
IMSE 381 (3) *Industrial Robotics*
CHEM 225 (3) *Organic Chemistry I*
CHEM 226 (3) *Organic Chemistry II*
CHEM 227 (2) *Organic Chemistry Lab*
BCHM 370 (3) *Principles of Biochemistry*
BENG 492 (1-3) *Guided Study*
ME 491 (1-3) *Directed Research Problems*

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