THE CITY COLLEGE – SCHOOL OF ENGINEERING
BIOMEDICAL ENGINEERING CURRICULUM
Fall 2021 - Spring 2022

March 23, 2022

Math 20100 Calculus I Pre: Math 19500 (C min.) 4 cr.	**Chem 10301** **General Chemistry I** Pre: Math 19500 (C min.) 4 cr.	**Bio 10100** Foundations of Biology I 4 cr.	**Engl 11000** Freshman Composition 3 cr.	**Liberal Arts**[4] 3 cr.
Math 21200 Calculus II Pre: Math 20100 (C min.) 4/ cr.	**Chem 10401** **General Chemistry II** Pre: Chem 10301 (C min.) 4 cr.	**Phys 20700** University Physics I Pre/Co: Math 21200 4 cr.	**BME 10100** Introduction to BME Pre/Co: Math 19500 1 cr.	**Engl 21007** Writing for Engineering Pre: Engl 11000 or FIQWS 3 cr.
Math 21300 Calculus III Pre: Math 21200 (C min.) 4 cr.	**Chem 21000 or** Applied Chemistry for BME Pre: Chem 10401; (engineering majors only) 3 cr. *(Fall Only)* **Chem 32002** [5] Biochemistry I Pre: Chem 26100, Chem 26300 (Pre-med Student)	**Phys 20800** University Physics II Pre: Phys 20700 Pre/Co: Math 21300 4 cr.	**BME 22000** Biostatistics & Research Methods Pre/Co: Math 21300, BME 10100 3 cr. *(Fall Only)*	**Liberal Arts**[4] 3 cr.
Math 39100 Differential Equations Pre: Math 20300 3 cr.	**ChE 22900** Chemical Engineering Thermo I Pre: Chem 10401 (C min.), Phys 20700 (Cmin.) Pre/Co: Math 39100 3 cr. *(Spring only)*	**ME 24600** Engineering Mechanics I Pre: Phys 20700 (C min.) & Math 20200 (C min.) Pre/Co: ME 14500 or BME 22000 3 cr.	**BME 20500** Bioelectrical Circuits with Lab Pre/Co: Phys 20800 (C min.), Math 39100 (C min.) 4 cr. *(Spring Only)*	**Liberal Arts**[4] 3 cr.
Math 34600 Elements of Linear Algebra Pre: Math 20300 3 cr.	**ChE 34100** [8] Transport Phenomena I Pre: Math 39100 (C min.) & ChE 22900 3 cr. *(Fall Only)*	**BME 40500** Biomedical Transducers and Instrumentation Pre: BME 20500 4 cr. *(Fall Only)*	**ME 33000** Mechanics of Materials Pre: Math 20300 (C min.) & ME 24600 3 cr.	**Bio 32100** Physiological Processes Pre: Bio 10100 & Math 20100 3 cr. *(Fall Only)*
BME 50100 Cell and Tissue Mechanics Pre: ME 33000 or ChE 31000, Bio 32100 3 cr. *(Spring Only)*	**BME 50300** Cell and Tissue Biomaterial Interactions Pre: ME 33000 or ChE 31000, Bio 32100 3 cr. *(Spring Only)*	**BME 50500** Image and Signal Processing in Biomedicine Pre: BME 40500 or (EE 25900 and EE 30600 & EE 33000) 3 cr. *(Spring Only)*	**BME 31000** Experimental Methods in BME Pre: BME 22000, ME 33000, Engl 21007 Pre/Co: Bio 22900 3 cr. *(Spring Only)*	**Bio 22900** Cell and Molecular Biology Pre: Bio 10100, Bio 32100 & Chem 21000 4 cr.
BME 50200 Cell and Tissue Transport Pre: ME 35600 or ChE 34100, Bio 32100 3 cr. *(Fall Only)*	**Technical Elective** *(See list of Technical Electives Below)* 3 cr.	**BME 30500** Dynamical Systems and Modeling Pre: BME 20500 or Engr 20400, ME 24600 Pre/Co: Math 34600 3 cr. *(Fall Only)*	**Engr 30000** [4] Impact of Biomedical Technology Pre: Engl 21007, Bio 32100 3 cr. *(Fall Only)*	**BME 45000** BME Senior Design I Pre: BME 31000 , BME 50100, BME 50300 Pre/Co: BME 50200, BME 50500 3 cr. *(Fall Only)*

Engineering Elective BME 59003 BME Indep. Study (3cr) BME 59001 BME Indep. Study (1cr) BME 51000 Microflu. Dvcs. Biotech BME I3000 Neur Engr & App Bioel BME I3110 Biofluid Mechs BME I4200 Org Transp. Pharm'kin BME I5000 Biomed Imaging BME I5100 Biomed Signal Proc. CSc 10200 Intro to Computing ChE 33000 ChE Thermo II ChE 34200 Transport II EE 33000 Electromagnetics Engr 10100 Engr Design (1cr) Engr I4200 Continuum Mechanics Engr I1100 Engineering Analysis Engr I7500 Poroelasticity ME 14500 CAD (2cr) ME 24700 Engineering Mechs II ME 32200 Cmptr Meths in Engr. ME 37100 Cmptr-Aided Design 3 cr. Total	**Technical Elective** [5] *(1 Course)* Bio 10200 Founds of Bio II Bio 20600 Intro to Genetics Bio 35000 Microbiology Bio 35400 Intro to Neurobio Bio 37500 Develop Bio Bio 41000 Cell Dev-Senes Bio 42000 Virology Bio 42500 Cancer Biology Bio 45400 Sensory Percept Bio 48300 Lab in Biotech. 3-5 cr. *(Partial List of Approved Courses)*	BME 50400 Cell and Tiss. Engr. BME 52000 Prac. Med. Dev. Design BME I6000 Advancd Biomats. BME I6100 Intel Prop, Reg & Qual BME I6400 Trans Chllges n Diag Dev BME I7000 Lab in Cell & Mol Engr BME I8000 Bone Biol. & Biomech. BME I9000 Skeletal Soft Tissue BME I9300 Scientific Ethics BME I9400 Spec. Tops n Mech. Lrn. BME I9500 Entrepreneurship Chem 24300 Quantitative Analysis Chem 26100 Org Chemistry I Chem 26200 Org Chemistry Lab I Chem 26300 Org Chemistry II Chem 40700 Envir Org Chem Chem 45902/32002 Biochemistry I Or any course from Engineering Electives	ChE 49808 Nanomats. ChE 51200 Pharm Appl CSc 10400 Discrt Math Struct. Math 32800 Numerical Anal Math 37500 Prob. Theory Math 37600 Math. Stats. Math 37700 Appl Stats & Prob. Math 39500 Cmplx Var Sci & E Phys 31500 Med. Phys. Phys 32100 Mod. Phys. Engrs Phys 32300 Quant Mech Phys 42200 Biomed. Phys. Sci 28000 Bioinformat.	**BME 46000** BME Senior Design II Pre: BME 45000 3 cr. *(Spring Only)*	**Liberal Arts**[4] 6 cr.

1. **The latest version of the curriculum sheet supersedes any curriculum and pre-/co-requisite information in the Undergraduate Bulletin or online.**
2. **"C" Passing Grade Requirement:** Courses in shaded area (▭) require a minimum passing grade of "**C**".
3. **Skills tests:** Certain students may be required to pass CUNY Assessment Tests in one or more subjects within 1 or 2 years of admission.
4. **Liberal Arts electives:** BME students must take Engr 30000 Social, Economic, and Cultural Impact of Biomedical Technology (3 credits), as well as five approved courses (15 credits), of which at least one (3 credits) must be at the 20000 level or higher. They should satisfy each of the Flexible Core (Pathways) liberal arts requirements in the Creative Expression (CE), World Cultures & Global Issues (WCGI), Individual & Society (IS), and U.S. Experience (US) areas. Prior courses in these four areas from other colleges can satisfy the electives. See ccny.cuny.edu/engineering/pathways for details and the Pathways course lists. A prior degree may remove the requirement of all four courses.
5. **Pre-med Curriculum:** Pre-med students must take the Organic Chemistry sequence (Chem 26100, 26200, 26300) as the Technical Electives, which increases the total credits by 2. Chem 32002 Biochemistry is then taken in place of Chem 21000, and Chem 26100 & 26300 replace Chem 21000 as a pre-requisite for Bio 22900.
6. **Other Graduation Requirements:** Apply for graduation during registration for the last semester. Minimum GPA of 2.00. Minimum QPA of zero. Residency Requirement: 30 credits of 30000-level or higher Biomedical Engineering courses taken at CCNY.
7. **Program Changes:** Substitution of other courses for required courses must be approved by the Chair of the Biomedical Engineering Department (ST-401), and Associate Dean of the Office of Undergraduate Affairs (ST-209).
8. Transfer students who have completed Engr. 23000 (Thermodynamics) must complete ME 35600 (Fluid Mechanics) instead of ChE 34100 (Transport Phenomena I).

Total Credits: 129 - 131.