

## Computer Engineering Curriculum Fall 2019 – Spring 2020

<b>Math 20100</b> Calculus I Pre: Math 19500 (C min.) <b>3–4 cr.</b>	<b>Chem 10301</b> General Chemistry I Pre: Math 19500 (C min.) <b>4 cr.</b>	<b>Engl 11000<sup>6</sup></b> Freshman Composition <b>3 cr.</b>	<b>Engr 10100<sup>6</sup></b> Engineering Design Pre/Co: Math 19500 (min.C) <b>1 cr.</b>	<b>CSc 10300</b> Introduction to Computing for Majors Pre: Math 19500 (C min.) or Pre/Co: Math 20100 (C min.) <b>3 cr.</b>	<b>Liberal Arts<sup>4</sup></b> <b>3 cr.</b>
<b>Math 21200 or 20200</b> Calculus II Pre: Math 20100 (C min.) <b>3–4 cr.</b>	<b>Phys 20700</b> General Physics I Pre/Co: Math 21200 or 20200 <b>4 cr.</b>	<b>Engr 10300</b> Analysis Tools for Eng'rs Pre: Math 20100 (C min.) <b>2 cr.</b>	<b>CSc 10400</b> Discrete Math Structure I Pre: Math 20100 (C min.) <b>4 cr.</b>	<b>Engl 21007</b> Writing for Engineering Pre: Eng 11000 or FIQWS <b>3 cr.</b>	
<b>Math 21300</b> Pre: Math 21200 (C min.) <b>or</b> <b>20300</b> Pre: Math 20200 (C min.) Calculus III <b>4 cr.</b>	<b>Phys 20800</b> General Physics II Pre: Phys 20700 Pre/Co: Math 21300 or 20300 <b>4 cr.</b>	<b>Engr 20400</b> Electrical Circuits Pre/Co: Phys 20800 (C min.), Math 21300 or 20300 (C min.) <b>3 cr.</b>	<b>EE 21000</b> Switching Systems Pre/Co: Math 21200 or 20200 (C min.) <b>3 cr.</b>	<b>CSc 21200</b> Data Structures Pre: CSc 10300 or permission, & 10400 <b>3 cr.</b>	
<b>Math 39100</b> Differential Equations Pre: Math 21300 or 20300 (C min.) <b>3 cr.</b>	<b>Math 34600</b> <b>Linear Algebra</b> Pre: Math 21200 <b>or</b> <b>39200</b> Lin. Alg. & Vector Analysis <i>if Math 21300 not taken</i> Pre: Math 20300 (C min.) <b>3 cr.</b>	<b>EE 20500</b> Linear Systems I Pre: Engr 10300 & 20400 Pre/Co: Math 39100 (C min.) <b>3 cr.</b>	<b>EE 24100</b> Electronics I Pre: Phys 20800 (C min.) Pre/Co: EE 20500 & EE 21000 <b>3 cr.</b>	<b>EE 31100</b> Probability & Statistics Pre: Math 21300 or 20300 (C min.) <b>3 cr.</b>	<b>CSc 22100</b> Software Design Lab Pre: CSc 21200 & Engl 21007 or 2100x <b>3 cr.</b>
<b>EE 22100</b> EE Lab I Pre: EE 21000, Engr. 20400 Pre/Co: Engr 10300 <b>1 cr.</b>	<b>CSc 21000</b> Assembly Language Pre: CSc 10300 or permission <b>3 cr.</b>	<b>EE 30600</b> Linear Systems II Pre: EE 20500 <b>3 cr.</b>	<b>EE 33000</b> Electromagnetics Pre: Phys 20800 & Math 39100 & Math 34600 or 39200 (all C min.) <b>3 cr.</b>	<b>EE 31200</b> Communication Theory Pre: EE 31100, EE 20500 <b>3 cr.</b>	<b>CSc 22000</b> Algorithms Pre: CSc 21200 <b>3 cr.</b>
<b>EE 32200</b> EE Lab II Pre: EE 22100 & EE 24100 <b>1 cr.</b>	<b>EE 45700</b> Digital Integrated Circuits Pre: EE 24100 <b>3 cr.</b>	<b>CSc 33200</b> Operating Systems <b>Pre: CSc 22000 &amp; 22100</b> <b>4 cr.</b>	<b>CSc 34200</b> Computer Organization Pre: (CSc 21000 & EE 21000) or CSc 21100 Co: CSc 34300 <b>3 cr.</b>	<b>CSc 34300</b> Computer Organize Lab Coreq: CSc 34200 <b>1 cr.</b>	<b>Liberal Arts<sup>4</sup></b> <b>3 cr.</b>
<b>Track Elective</b> <i>(from <u>Systems track</u> or <u>Computation &amp; Signal Processing track</u> lists below)</i> <b>3 cr.</b>	<b>CSc 59866</b> Senior Project I Pre/Co: senior standing & permission <b>3 cr.</b>	<b>EE 59868</b> Capstone Design for CpE I Pre: EE 32200, Pre/Co: Lab EE 42500 & senior standing <b>Two consecutive semesters</b>	<b>EE 42500</b> Computer Engineering Lab Pre: EE 32200 Pre/Co: EE 34400 or 44400 or (CSc 21000 & CSc 34200) <b>1 cr.</b>	<b>Computer Engineering Elective</b> <i>(from list below)</i> <b>3 cr.</b>	<b>Liberal Arts<sup>4</sup></b> <b>3 cr.</b>
<b>Track Elective</b> <i>(from same track as above)</i> <b>3 cr.</b>	<b>CSc 59867</b> Senior Project II Pre: CSc 59866 <b>3 cr.</b>	<b>EE 59869</b> Capstone Design for CpE II Pre: EE 59868 <b>3 cr.</b>	<b>Practice / Ethics Issues (1 Course)</b> CSc 37500: Social Iss. Comp. <b>Eco 10400: Intro Quant Econ</b> EE 43800: Mgmt Concepts Eng Phil 34902: Computer Ethics Engr 27600: Eng. Economics Engr 30000: Impact Bio Tech <b>3 cr.</b>	<b>Liberal Arts<sup>4</sup></b> (20000 or higher) <b>3 cr.</b>	<b>Liberal Arts<sup>4</sup></b> (20000 or higher) <b>3 cr.</b>

**Systems track**

**Computation & Signal Processing track**

CSc 41200: Computer Networks EE 33300: Intro Antennas, Microwv & Fiber Ops EE 33900: Semiconductor Materials & Devices EE 37100: Linear Feedback Systems EE 45100: Communication Electronics	EE 46000: Computer Communication Systems EE 46300: Wireless Communications Engr 23000: Thermodynamics Phys 32300: Quantum Mech for Applied Physics	CSc 30100: Numerical Issues in Sci Programming CSc 47000: Image Processing CSc 47100: Computer Vision CSc 47200: Computer Graphics CSc 47900: Digital Libraries <b>CSc 59929: Intro. to Machine Learning</b>	CSc 59944: Neural Computing CSc 11900: Pattern Recognition† EE 45300: Digital Signal Processing <b>EE 47100: Intro to Digital Image Processing</b> <b>EE G6530: Biologically Inspired Computing</b> EE 12200: Image Processing
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**Computer Engineering Electives**

CSc 30100	CSc 33600	CSc 43000	CSc 44200	CSc 47000	CSc 47800	BME 50500	EE 35700	EE 45200	EE 45800	EE 46300
CSc 30400	CSc 41200	CSc 43200	CSc 44600	CSc 47100	CSc 47900	EE 33300	EE 37100	EE 45300	EE 46000	EE 46400
CSc 31100	CSc 42000	CSc 43500	CSc 44800	CSc 47200	CSc 48000	EE 33900	EE 44100	EE 45400	EE 46200	EE 51003
CSc 32200	CSc 42200	CSc 43800	CSc 45000	CSc 47300	CSc 48600	EE 34200	EE 45100	EE 45600		
CSc 33500	CSc 42800	CSc 44000	CSc 45400	CSc 47500	CSc 51003					

**1. The latest version of the curriculum sheet supersedes any curriculum and pre-/corequisite information in the Undergraduate Bulletin or online.**

- “C” Passing Grade Requirement:** Courses in shaded area (■) require a minimum passing grade of “C”.
  - Skills tests:** Certain students may be required to pass CUNY Assessment Tests in one or more subjects within 1 or 2 years of admission.
  - Liberal Arts electives:** CpE students must take six approved courses, of which at least two must have course numbers of 20000 or higher. Four of the courses should satisfy 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. The remaining two courses must be chosen from the list on the Grove School of Engineering web site at [cnv.cuny.edu/engineering/gen-ed](http://cnv.cuny.edu/engineering/gen-ed).
- See [cnv.cuny.edu/engineering/pathways](http://cnv.cuny.edu/engineering/pathways) for details and the Pathways course lists. A prior degree may remove the requirement of all six courses.
- 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 Computer Science or Electrical Engineering courses taken at CCNY.
  - Transfer students with credit for Math 21200 or 20200** are considered too advanced for Engr 10100. They should take an additional 1-credit CSc or EE lab instead. (FIQWS 10026 fulfills the requirements for Engr 11000 and Engr 10100.)
  - Program Changes:** Substitution of other courses for required courses must be approved by the Chair of the Computer Science Department (NAC 8/206) for CSc courses or the Chair of the Electrical Engineering Department (ST-602) for EE courses, and approved by the Associate Dean of the Office of Undergraduate Affairs (ST-209) in both cases.

**Total Credits: 129–132.**

*Changes since 12/2015 are in red.*