



**Electrical Engineering**  
**Fourth Year Program, 2018-19**  
**Program Compulsory and Elective Course Advising**

**Electrical Engineering (EE) Fourth-Year Curriculum**

ENGR 413 Law and Ethics for Engineers	3
ENGR 451 Microelectronics II	3
ENGR 499 Engineering Capstone Design Project	6
Design Electives <sup>1</sup>	12
Technical Electives <sup>2</sup>	12
<b>Total Credits</b>	<b>36</b>

<sup>1</sup> The four design electives are chosen from the list of Approved Electrical Engineering Design Electives given below. These design electives differ from technical electives in that they have 50% engineering design content, as defined by the Canadian Engineering Accreditation Board (CEAB).

<sup>2</sup> The four technical electives are chosen from the list of Approved Electrical Engineering Technical Electives given below or are chosen in accordance with the Alternative Electrical Engineering Technical Electives given below.

**Approved Electrical Engineering Design Electives\*****Term 1**

ENGR 401 Bioinstrumentation  
ENGR 406 Microelectromechanical Systems  
ENGR 458 Power Electronics  
ENGR 461 Digital Communications  
ENGR 467 Real-Time and Embedded System Design  
ENGR 468 Advanced Digital System Design

**Term 2**

ENGR 454 Motor Drive Systems  
ENGR 462 Digital Signal Processing II  
ENGR 472 Fibre Optics and Photonics  
ENGR 492 Finite Element Methods

**Approved Electrical Engineering Technical Electives\*****Term 1**

ENGR 402 Biotechnology  
ENGR 452 Electronic Materials and Devices  
ENGR 455 Power System Analysis and Design  
ENGR 456 Electrochemical Energy Storage Systems  
ENGR 459 Advanced Electromagnetics  
ENGR 463 Communication Networks  
ENGR 470 Microwave Engineering  
ENGR 480 Modern Control  
ENGR 489 Multi-criteria Optimization

**Term 2**

ENGR 433 Construction Engineering and Mgmt.  
ENGR 453 Internet of Things  
ENGR 465 Wireless Communications  
ENGR 466 Introduction to VLSI Systems  
ENGR 469 Polymer Engineering  
ENGR 481 Mechatronics  
ENGR 495 Tissue Engineering

\* Note that these ENGR courses are subject to minimum and maximum enrolments. The School of Engineering reserves the right to cancel an ENGR course if the minimum enrolment is not met. In such a case, you will be notified via e-mail about the cancellation. Check the UBC Student Service Centre to see the course availability.

**Alternative Electrical Engineering Technical Electives**

1. All of the above Approved Electrical Engineering Design Electives listed above can be credited technical electives. Any design electives taken over and above those required will count towards the requirement of technical electives.
2. All ENGR 300 and 400-level courses can be credited as technical electives. Note that registration in such courses is subject to prerequisite requirements (or instructor approval if the prerequisite requirements are not met and need to be waived).
3. A maximum of two graduate 500-level courses (i.e., 6 credits) from within the School of Engineering may be approved as technical electives. For courses cross-listed as undergraduate 400 level and graduate 500 level courses, you must register in the undergraduate version. You must have a minimum average of 76% in your completed 300 and 400 level courses to be eligible for registration in graduate courses. Graduate courses being offered are listed as ENGR 5XX courses on the Student Services Centre.
4. Students may take a maximum of two undergraduate 300 or 400 level courses (6 credits) from outside the School of Engineering as technical electives. To register for in an external course for credit as a technical elective, you first require the permission of the Electrical Engineering Program Coordinator to take the external course. Then, if you are missing the course's prerequisite(s), you need the permission of the external course's instructor, to waive the prerequisite(s). You may require assistance from the external program's advisor to register you in the course, as the School of Engineering cannot register you in non-ENGR courses. Some external courses are pre-approved as technical electives—and thus do not require permission from the Electrical Engineering Program Coordinator. These pre-approved technical electives are listed here\*\*:

COSC 301 Intro. to Data Analytics	MATH 319 Intro. to Partial Differential Equations	PHYS 304 Intro. to Quantum Mechanics
COSC 315 Intro. to Operating Systems	MATH 340 Intro. to Linear Programming	PHYS 305 Intro. to Biophysics
COSC 322 Intro. to Artificial Intelligence	MATH 350 Complex Variables and Applications	PHYS 308 Optics
COSC 406 Numerical Optimization		PHYS 310 Intro. to Medical Physics
		PHYS 336 Intro. to Medical Imaging
		PHYS 401 Electromagnetic Theory
		PHYS 402 Advanced Quantum Mech.
		PHYS 418 Methods of Theor. Physics
		PHYS 420 Data and Image Processing
		PHYS 425 Low Temperature Physics

\*\* Note that not all of these courses are offered each academic year. Check the UBC Student Service Centre to see the course availability.  
For fourth-year course advising, contact the Electrical Engineering Program Coordinator: Dr. Holzman, [jonathan.holzman@ubc.ca](mailto:jonathan.holzman@ubc.ca).  
For technical inquiries regarding registration, contact the Engineering Advisor: Ms. Renee Leboe, [renee.leboe@ubc.ca](mailto:renee.leboe@ubc.ca).