

SEMICONDUCTOR TECHNOLOGY POST-BACCALAUREATE CREDIT CERTIFICATE PROGRAM

Person-in-Charge	John F. Doherty
Program Code	SMCNT
Campus(es)	University Park

The Semiconductor Technology Post-Baccalaureate Certificate provides a broad background in three main semiconductor technology areas: linear analog electronic circuits, digital electronic circuits, and packaging of semiconductor circuits.

Courses taken in the certificate program may be applied toward the graduate degree program in Electrical Engineering at either the M.S. or Ph.D. levels, subject to restrictions outlined in GCAC-309 Transfer Credit (<https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-300/gcac-309-transfer-credit/>). Certificate students who wish to have certificate courses applied towards a graduate degree must apply and be admitted to that degree program. Admission to the graduate degree program is a separate step and is not guaranteed.

Effective Semester: Fall 2025
Expiration Semester: Spring 2030

Admission Requirements

Applicants apply for admission to the program via the Graduate School application for admission (<https://gradschool.psu.edu/graduate-admissions/how-to-apply/>). Requirements listed here are in addition to Graduate Council policies listed under GCAC-300 Admissions Policies (<https://gradschool.psu.edu/graduate-education-policies/>). International applicants may be required to satisfy an English proficiency requirement; see GCAC-305 Admission Requirements for International Students (<https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-300/gcac-305-admission-requirements-international-students/>) for more information.

Code	Title	Credits
Required preparatory coursework, or equivalent:		
EE 210	Circuits and Devices	4
EE 310	Electronic Circuit Design I	4
EE 311	Electronic Circuit Design II	3

Linear circuit analysis, frequency and phase response of linear circuits; linear and nonlinear applications of semiconductor devices, such as diodes and transistors; electronic circuit design, frequency response characteristics, feedback, stability, efficiency, and integrated circuit techniques.

Certificate Requirements

Requirements listed here are in addition to requirements listed in Graduate Council policy GCAC-212 Postbaccalaureate Credit Certificate Programs (<https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-200/gcac-212-postbaccalaureate-credit-certificate-programs/>).

To earn a post-baccalaureate certificate in Semiconductor Technology, a minimum of 9 credits is required.

A minimum grade of C is required in each course. A minimum grade of B is required to apply the course credits towards any graduate degree seeking program in Electrical Engineering.

Code	Title	Credits
Required Courses		
EE 410	Linear Electronic Design	3
EE 416	Digital Integrated Circuits	3
EE 443	Introduction to Heterogeneous Integration & Packaging of Electronic Systems	3

Courses

Graduate courses carry numbers from 500 to 699 and 800 to 899. Advanced undergraduate courses numbered between 400 and 499 may be used to meet some graduate degree requirements when taken by graduate students. Courses below the 400 level may not. A graduate student may register for or audit these courses in order to make up deficiencies or to fill in gaps in previous education but not to meet requirements for an advanced degree.

Learning Outcomes

1. Identify the foundational engineering methods used in semiconductor design and manufacturing.
2. Design a digital integrated circuit to meet a predefined set of specifications.
3. Design a linear integrated circuit using a combination of mathematical analysis, computer simulation, and laboratory breadboarding and measurement.
4. Design a board with integrated circuits for high speed signaling and power delivery.