

**Associate of Applied Science in Electrical Engineering Technology
– Bachelor of Science in Electrical Engineering**

TRANSFER AGREEMENT

between

COLLEGE OF LAKE COUNTY
Associate of Applied Science in Electrical Engineering Technology

and

MILWAUKEE SCHOOL OF ENGINEERING®
AAS-EET to BSEE Transfer Track
in the Bachelor of Science in Electrical Engineering program

Effective Fall 2019

This agreement applies to students entering the College of Lake County AAS-Electrical Engineering Technology program in Fall 2019 and entering the MSOE® AAS-EET to BSEE Transfer Track in the Electrical Engineering program in Fall 2021.

PURPOSE

Any student who:

- successfully completes the Associate of Applied Science in Electrical Engineering Technology (AAS-EET) program at College of Lake County (CLC),
- successfully completes other specified courses at CLC per this agreement, and
- meets admission requirements at Milwaukee School of Engineering (MSOE)

can earn a Bachelor of Science degree in Electrical Engineering (BSEE) at MSOE by successfully completing the AAS-EET to BSEE Transfer Track in the Electrical Engineering program.

In particular, any CLC student who:

- a) successfully completes all courses in the Electrical Engineering Technology program at CLC with a grade of C or better (not C-) in each course,
- b) successfully completes all other specified courses at CLC, as defined in this transfer agreement, with a grade of C or better (not C-) in each course, and
- c) meets the MSOE admission requirements for transfer students into the Electrical Engineering program at MSOE, with a cumulative grade point average (CGPA) of 3.00 or greater

will be admitted into the AAS-EET to BSEE Transfer Track in the Bachelor of Science in Electrical Engineering program at MSOE.

Topical Areas for Competencies Required for Admission into the MSOE AAS-EET to BSEE Transfer Track Program

MSOE AAS-EET to BSEE Transfer Track in the BS in Electrical Engineering program
CLC AAS-EET Associate of Applied Science in Electrical Engineering Technology

Topical Areas	CLC Course Number
1. Written Communication a) GS-1001 requirement b) GS-1002 requirement	ENG-121 (or taken at MSOE) ENG 120
2. Calculus	MTH 145, 146*
3. Social Sciences and/or Humanities	SOC 121, PSY 122
4. Economics	ECO 221 or ECO 222
5. Science: physics of mechanics (PH-113 equiv.)	PHY 121
6. EE-1000 equivalent	EET 115, EET 170
7. DC/AC Circuits (incl DC/AC III & ECA/equiv.): Electricity basics, DC and AC (with phasors) circuit analysis: series-parallel, superposition, complex power, nodal, Thevenin, Norton, ideal transformers, balanced three phase circuits and power; AC circuit frequency response: Bode plots (first order circuits), resonant circuits	EET 174, EET 176, EET 113, and EET 211 (effective 2016-17 academic year)**
8. Electron Devices & Circuits with ECA/equiv.: Diodes, BJTs, FETs, OP-AMPs, other linear ICs; BJT and FET amplifiers: DC bias, small signal, mid-band, and frequency response analyses	EET 113 and EET 211 (effective 2016-17 academic year)**
9. Digital Electronics: Number systems, combinational logic functions and devices, logical simplification, sequential logic devices and circuits, other digital devices and circuits	EET 213 or EET 223
10. Microprocessors/Microcontrollers: Architecture, algorithm development, programming (preferably in C), interfacing	EET 216
11. Power and Motor Systems: Motors, generators, three phase power, transformers, intro. to Programmable Logic Controllers (PLCs)	EET 174, EET 176, and EET 230
12. Programmable Logic Controllers (PLCs):	ELC 171 and ELC 271
13. Data Communications and Networking:	EIT 111 and EIT 210

*Transfer students who have completed these calculus courses are scheduled to take MA-2323 at MSOE.

**Transfer students who take this coursework in the 2016-17 academic year and thereafter satisfy requirements 7 and 8. Transfer students who took this coursework prior to the 2016-17 academic year will be required to take EE-2060 and EE-2070 (in lieu of EE-3001B and EE3002B), and additionally to take EE-3102 at MSOE. Alternatively, such students may take an MSOE-approved "Electronic Circuit Analysis" course at another two-year college with which an AAS-EET to BSEE transfer agreement exists. The latter is subject to MSOE approval on a case-by-case basis. Pre-approval is recommended.

CLC Course Listing
(in effect at CLC in Fall 2019 for transfer to MSOE in Fall 2021)

Semester 1

Course Number	Course Title	Credits	Hrs / Wk	
			Lec	Lab
EET 170	DC Circuit Fundamentals	2	1.5	1
EET 115	Electronic Laboratory Techniques	2	1	2
EET 174	AC Fundamentals	2	1.5	1
MTH 123	Trigonometry <i>or</i>			
MTH144*	Precalculus	3-5	5	0
ENG 120	Technical Composition I	3	3	0
SOC 121***	Intro to Sociology	<u>3</u>	3	0
Semester Total		15-17		

Semester 2

EET 176	Circuit Analysis and Network Theorems	4	3	2
EET 223	Intro to Digital Electronics	4	3	2
CMM 121**	Fundamentals of Speech	3	3	0
PHY 121	General Physics	<u>5</u>	4	2
Semester Total		16		

Semester 3

EET 113	Solid State Electronics	4	3	2
EET 230	Electrical Machinery	3	2	3
MTH 145	Calculus & Analytic Geometry I	5	5	0
PHI 122**	Logic	3	3	0
PSY 122***	Industrial/Organizational Psychology	<u>3</u>	3	0
Semester Total		18		

Semester 4

EET 211	Advanced Solid State Electronics	4	3	2
EET 216	Microprocessors I	4	3	2
ECO 221	Principles of Macroeconomics <i>or</i>			
ECO 222	Principles of Microeconomics	3	3	0
(qty. 2)	Approved Technical Electives****	6 - 8		
Semester Total		<u>17 - 19</u>		
Program Total		66 - 70		

* This course is required in the CLC EET program to earn the AAS EET degree, but does count toward transfer requirements into the MSOE AAS-EET to BSEE Transfer Track program.

** Transferable into the BS-level of the MSOE AAS-EET to BSEE Transfer Track program:

CMM 121 Fundamentals of Speech transfers as GS-1003.

PHI 122 Logic transfers as HU431B (an HU-4XX elective).

*** Or other MSOE-approved social science courses.

**** Suggested additional courses (consult with CLC academic advisor for use as CLC Approved Technical Electives):

MTH 146 Calculus & Analytic Geometry II, 4 cr. [*crucial* for the AAS-EET to BSEE transfer track at MSOE]

MTH 246 Calculus & Analytic Geometry III, 4 cr. (transfers for MA-2323 and MA-330 at MSOE)

ENG 121 English Composition I, 3 cr. (transferable to MSOE for GS1001, but not a CLC technical elective)

ELC 171 Programmable Logic Controllers, 3 cr., and ELC 271 Advanced Programmable Controls, 3 cr. (both are required for transfer as MSOE EE technical elective EE474)

EIT 111 Digital & Network Fundamentals, 4 cr., and EIT 210 Data and Network Communication, 4 cr. (both are required for transfer as an MSOE EE technical elective under this transfer agreement)

PROVISIONS

The following provisions specify the standard procedures and terms of this transfer agreement. Text in italics is meant to clarify the rationale behind the corresponding provision. Non-compliance with any provision may result in nullification of this transfer agreement. Because these transfer agreement provisions are used in transfer agreements with several two-year colleges, the term "Two-year College" will be used to refer to the specific college named at the beginning of this transfer agreement. MSOE will be used to refer to Milwaukee School of Engineering.

1. Each institution will obtain the express written approval for using the other institution's name in any promotional, advertising, and marketing media associated with this transfer agreement. Any promotional literature or other media will clearly indicate that the transfer is into the AAS-EET to BSEE Transfer Track of the Electrical Engineering program, *not* just the Electrical Engineering (EE) program, at MSOE. All people involved with the promotion of this transfer arrangement will clearly maintain this distinction to all audiences. A specific person in each public relations department and a specific academic program person(s) per institution will be designated for coordination and signoff, as listed on the "Institution-Specific Information" section in this transfer agreement. Each institution may electronically link to this transfer agreement and, with notice to the other party, to the website of the other institution. Guidelines for the use of MSOE®'s name and/or logo are listed on the "Guidelines for use of Milwaukee School of Engineering®'s Name and/or Logo" section in this transfer agreement.

The motivation for this provision is to ensure that each institution complies with accreditation and institutional criteria in promotional, advertising, and marketing media.

2. An active transfer agreement begins at the commencement of fall classes in the year stated on the first page of this agreement. The agreement must be actively reviewed by program faculty of both institutions and renewed each year to continue the agreement. Reasonable accommodations will be made for students if either program must be changed, but additional courses may be required of students if program changes occur. Students must be clearly informed of this possibility "up front."

The intent of this provision is to recognize that changes in either or both of the two academic programs must be coordinated to accommodate the minimum two year lag between when a student begins at the Two-year College and begins at MSOE. However, each institution must preserve the right to change its academic programs on a timely basis, such as due to an immediate change in accreditation requirements.

3. The AAS-EET to BSEE Transfer Track at MSOE will be arranged so that the student who successfully completes all of the Two-year College courses specified in this agreement each year that the agreement is in force may enter the MSOE AAS-EET to BSEE Transfer Track program at the beginning of the subsequent academic year as outlined in this agreement. Exceptions to this clause are stated in provision 2. In the event that a Two-year College student completes the specified courses over an extended period of time in excess of the

standard full-time schedule, and during that time the specified courses and/or core curricula have changed, then reasonable efforts to accommodate this student into MSOE will be made. However, on-track status in the AAS-EET to BSEE Transfer Track program at MSOE is not guaranteed.

The intent of this provision is to promote curriculum stability yet to allow curriculum modifications that are advantageous or required, such as per accreditation mandates.

4. Curriculum changes which impact the transfer agreement may not be enacted during the academic year in which the agreement is active unless both the Program Director of the Electrical Engineering program at MSOE and the designated individual(s) in the corresponding transfer program at the Two-year College give their explicit consent, or unless curriculum changes are dictated by accreditation or institutional mandates. Minor revisions (such as course renumbering) are permitted, but must be communicated to the other institution promptly via a memorandum of understanding. Curriculum changes that do not satisfy the transfer agreement provisions will nullify this transfer agreement.

The intent of this provision is to protect the integrity of the transfer arrangements for transfer students. This provision should be superfluous. Curriculum changes should be enacted in concert with the yearly transfer agreement renewal process.

5. The Two-year College will consent to the promotion of this transfer agreement by MSOE personnel in appropriate classroom settings and at job fairs and similar functions at the Two-year College.
6. Any formal presentations of this transfer agreement must be made by either Two-year College representatives, who are approved by the individual designated on the "Institution-Specific Information" section, or by MSOE representatives who are knowledgeable of this transfer agreement. See provision 1.

The intent of this provision is to ensure that the agreement is accurately communicated to interested parties.

7. MSOE will have access to the actual exams and laboratory assignments given by the Two-year College faculty to the students in electronics-related courses utilized in the transfer agreement. Individual student names should be removed in samples of student work. In the rare case that a faculty member does not cooperate with this provision, representative materials will be provided (see provision 11, also). Excessive denials of access to these materials may result in non-renewal of this transfer agreement. Denial of access to designated bridge courses (see provision 9) may result in immediate nullification of the transfer agreement. Under no circumstances is either institution allowed to reproduce any exchanged materials for distribution to anyone other than program faculty and administration involved with the courses in this transfer agreement, and accreditation agency visitors for review while on campus of the institution, without the express written consent from the other institution. In the event that permission to adapt (modify and use) any MSOE academic

instructional materials provided to the Two-year College is granted, the materials must clearly be labeled with:

Adapted from (name of work) © (year) MSOE with permission of MSOE®.

Permission to use these materials begins with the signing of this transfer agreement and expires with the annual expiration of the transfer agreement.

The purpose of this access is to assist faculty from both institutions in developing and maintaining their coursework to ensure the equivalency and level of topical coverage for electronics-related courses utilized in the transfer agreement.

8. For the instruction of the designated electronics bridge courses (see provision 9), the Two-year College will use faculty with at least a BS degree in electrical engineering, electrical engineering technology, or other related field (as approved by MSOE), and with at least one of the following: (a) an MS degree in electrical engineering, electrical engineering technology, or other related field (as approved by MSOE), (b) current registration as a Professional Engineer (PE), or (c) successful completion of a workshop offered by MSOE on instructional techniques for electronics bridge courses. The above-stated credentials are considered appropriate educational background for instructors of the electronics bridge courses.
9. The electronics bridge courses and the calculus courses specific to the Two-year College are designated in provision 14. These courses will include a lecture format at a level and pace that prepares students for effective learning in a traditional course environment at the university level. The electronics bridge courses will also include a laboratory component. Copies of the actual examinations and other designated student work for a sample of students in the electronics bridge courses, other designated courses, and the calculus courses, as requested by MSOE, will be delivered to MSOE for the purposes of assessment and accreditation. Individual student names should be removed in samples of student work. Any exceptions to this provision are noted in provision 14. Non-adherence to this provision may result in students being required to take and pass entrance examinations for admittance into the AAS-EET to BSEE Transfer Track program at MSOE and/or revocation of this transfer agreement.

The intent of this provision is to ensure that students are prepared to learn effectively in the university environment that exists in the EE program at MSOE.

10. The Two-year College student must pass each course with a C or better (not C-) in order for the course to receive transfer credit in the AAS-EET to BSEE Transfer Track of the Electrical Engineering program at MSOE. Any exceptions to this policy must be approved in writing by the Program Director of the Electrical Engineering program or his/her designee at MSOE. Under the condition that the student must retake one or more courses, the student is not guaranteed on-track status in the AAS-EET to BSEE Transfer Track program at MSOE. The requirement to retake a designated bridge course (see provision 9) with a grade of less than a C may not be waived without exceptional cause as approved by MSOE.

The intent of this provision is to allow an "early" course with a passing grade below a C to transfer if there is sufficient evidence in subsequent courses for which the course in question is a prerequisite to warrant the exception.

11. The Two-year College and MSOE will cooperate on the assessment of student outcomes in order to ensure and improve the viability of this transfer agreement. This cooperation includes arrangements whereby MSOE may obtain samples of assessment materials to include graded examples of student writing, examinations, and so forth. Individual student names should be removed in samples of student work.

The intent of this provision is to assess transfer student capabilities as they enter MSOE and to satisfy the requirements of accreditation agencies. Also, the collection of these data will be useful for continuing promotion of this transfer agreement.

12. This agreement may be terminated by either the Two-year College or MSOE if either fails to maintain regional accreditation or if BSEE program accreditation is discontinued or terminated.
13. MSOE will assemble lists of Social Sciences (SS), Humanities (HU), and other elective courses from the Two-year College that are approved to transfer under this transfer agreement if taken and successfully completed with a grade of C or better. These lists may be distributed to faculty, staff, and students at the Two-year College for the purpose of transfer advising. Any course on these lists must be completed during an academic term that begins within the effective and expiration dates indicated on the lists to guarantee transfer eligibility. These lists will be updated as needed including revised effective and expiration dates. The corresponding MSOE courses are indicated so that Two-year College students do not enroll in redundant courses for the purpose of transfer. Any significant change within the competencies or topical coverage of an approved course immediately renders the course unapproved for transfer unless reapproved by MSOE. Retroactive approval by MSOE is not guaranteed. Transfer students must consult with an MSOE EE program advisor if more than a total of two approved HU/SS courses are to be transferred, including those listed under item 3 on page 2, to ensure that EE program requirements are being met.

The intent of this provision is to specify alternative Social Sciences and Humanities courses that a student can take to satisfy the Topical Area numbered 3 on page 2, and to specify additional courses that a student can take to satisfy course requirements in the AAS-EET to BSEE Transfer Track of the Electrical Engineering program at MSOE. Another intent of this provision is to avoid situations where a student takes a course(s) with the expectation of transferability, but violates MSOE transfer, program or institutional requirements, such as:

- *Enrollment in redundant courses. (Redundant approved courses only count toward one course for transfer.)*
- *Balance of the number of Social Sciences and Humanities courses per MSOE institutional general education requirements. (For example, if a student takes three approved SS courses, only two of those courses would normally count towards transfer requirements into the AAS-EET to BSEE Transfer Track.)*

- *Eligibility for transfer of a required course or a math/science elective in the AAS-EET to BSEE Transfer Track.*

14. Any provisions specifically applicable with College of Lake County:

a. Identification of the electronics bridge courses by course number and title:

EET 176	Circuit Analysis and Network Theorems
EET 113	Solid State Electronics
EET 211	Advanced Solid State Electronics

Identification of the calculus courses by course number and title:

MTH 145	Calculus and Analytical Geometry I
MTH 146	Calculus and Analytical Geometry II

Institution-Specific Information

The purpose of this section is to provide information that is specific to each institution and is current as of the signing of this transfer agreement. Any changes to this information should be promptly communicated to the other institution. This information should include:

Name, Title, Phone Number(s), E-mail Address(es)

At College of Lake County:

Administrative person(s) directly responsible for the CLC program:

Dr. Richard Ammon
Dean, Engineering, Math, and Physical Sciences Division
847-543-2499
rammon@clcillinois.edu

Faculty directly responsible for the CLC program:

Michelle Leonard
Department Chair, Electrical Engineering Technology
847-543-2760
mleonard@clcillinois.edu

Person(s) designated to sign off on curriculum changes: (several sign-off layers) contact:

Michelle Leonard
Department Chair, Electrical Engineering Technology
847-543-2760
mleonard@clcillinois.edu

Person(s) designated to approve individuals who will make formal presentations on the CLC program:

Michelle Leonard
Department Chair, Electrical Engineering Technology
847-543-2760
mleonard@clcillinois.edu

Person(s) designated for coordination and signoff of public relations/marketing and other promotional materials: (several sign-off layers) contact:

Michelle Leonard
Department Chair, Electrical Engineering Technology
847-543-2760
mleonard@clcillinois.edu

Website address for the institution: www.clcillinois.edu

Website address specific to the CLC program: www.clcillinois.edu/programs/eet

At Milwaukee School of Engineering:

Administrative person(s) directly responsible for the EE program:

Dr. Stephen Williams
EECS Department Chair
414-277-7420
williams@msoe.edu

Faculty directly responsible for the EE program and AAS-EET to BSEE Transfer Track, including curriculum changes:

Dr. Sheila Ross
EE Program Director
414-277-2381
ross@msoe.edu

Dr. Robert Strangeway
AAS-EET to BSEE Transfer Track Coordinator
414-277-7311
strangew@msoe.edu

Person(s) designated for coordination and signoff of public relations/marketing and other promotional materials:

Mr. Sebastian Thachenkary (for sign-off)
Vice-President of Marketing and
Community Engagement
414-277-7141
thachenkary@msoe.edu

Dr. Sheila Ross
EE Program Director
414-277-2381
ross@msoe.edu

Dr. Robert Strangeway
AAS-EET to BSEE Transfer Track Coordinator
414-277-7311
strangew@msoe.edu

Mr. Mark Anderson
Director of Transfer Admission
414-277-4544
andersonm@msoe.edu

Website address for the institution: www.msoe.edu

Website address specific to the AAS-EET to BSEE Transfer Track program:

<https://www.msoe.edu/academics/undergraduate-degrees/engineering/electrical-engineering/electrical-engineering-aas-eet-to-bsee-transfer-plan/>

Guidelines for use of Milwaukee School of Engineering®'s Name and/or Logo

The motivation for this addendum is to insure that each Institution complies with accreditation and institutional criteria in all communication materials including, but not limited to, those generated or produced for marketing, advisement and/or legal purposes.


In an effort to meet standards set by our accreditation agencies, to minimize any confusion on the part of prospective or current students, and to protect the use of MSOE's name and logo, it is imperative that use of or reference to our name or programs be limited to those deemed appropriate by MSOE. As specified in the transfer agreement, MSOE's Vice President of Marketing and Community Engagement or the designee will approve any and all narrative and graphic representation containing MSOE's name, logo or reference to our programs before it is published or distributed in any way.

To expedite the process of developing content for use in promotional literature or digital platforms, the following minimum guidelines should be followed. Noncompliance will result in disapproval.


Any promotional literature or digital media content will clearly indicate that the transfer, upon which this transfer agreement is based, is into the AAS-EET to BSEE Transfer Track of the Electrical Engineering program, not the traditional track of the Electrical Engineering (EE) program, at MSOE. All people involved with the promotion of this transfer arrangement will clearly maintain this distinction to all audiences at all times.

MSOE will be referred to as a university however please use the preferred name (MSOE) or Milwaukee School of Engineering when referring to the institution but not "MSOE University". The "university block" in the logo is considered a clarifier in the graphic form only and is not spoken or written as part of the formal name. For clarity, it may be appropriate to use Milwaukee School of Engineering, then use MSOE in later references of the same communication. In no instance shall MSOE be referred to as a college or school.

MSOE has added a moniker to its logo. MSOE's name has not changed. Although MSOE refers to itself as a university, the word "university" is not part of its name.

The revised logo appears as below and should be used on all materials and on all digital platforms unless it would be so small that "UNIVERSITY" would be illegible. If that were the case, the original block logo  is to be used.



The name Milwaukee School of Engineering®, the acronym MSOE® and the  logo are all registered trademarks. The first time the name or acronym appear in any document they must have the ® mark. It is not necessary to include the ® mark with subsequent mentions in the same document or page. The logos have the ® mark embedded.

In materials where color is used, MSOE's logo will always be red, white and black. If PMS 200 (red) is not available, only slight variations of the color will be acceptable. If this is not possible to accomplish, the logo must appear in black and white as follows:



Given the absolute need to provide clarity as to the limitations of the transfer agreement and avoid potential misunderstandings, in no instance shall MSOE's name or logo be used on a banner of any kind. For the same reason, communication in the form of brochures, catalogs, Web pages, blogs, letters, e-mail, posters, etc. must be carefully reviewed by MSOE. MSOE's logo may not appear on the cover of any literature, nor in the header on any digital platforms.

Contact the Vice President of Marketing and Community Engagement indicated on the Institution-Specific Information section in this transfer agreement with any questions you may have and for needed approvals.

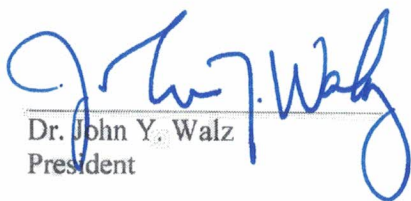
04-15-2019

Signatories

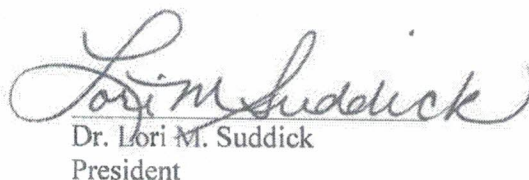
This agreement, signed and dated this 31 day of October, 2019, has been thoroughly reviewed and approved by both institutions. The agreement is in effect for the 2019 – 2020 academic year.

Milwaukee School of Engineering

College of Lake County



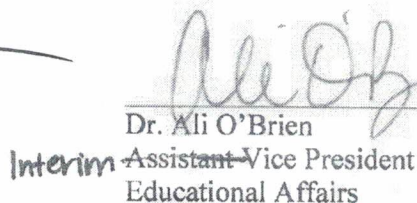
Dr. John Y. Walz
President



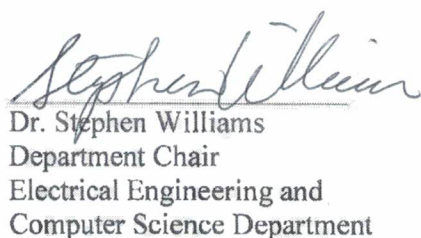
Dr. Lori M. Suddick
President



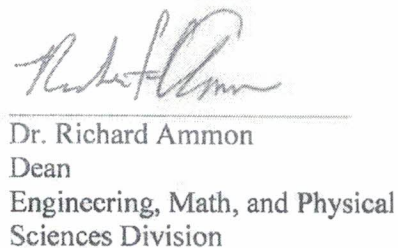
Dr. Eric T. Baumgartner
Vice President of Academics



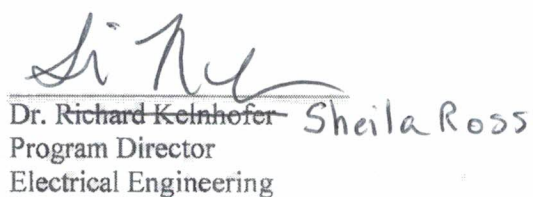
Interim Dr. Ali O'Brien
~~Assistant~~ Vice President
Educational Affairs



Dr. Stephen Williams
Department Chair
Electrical Engineering and
Computer Science Department



Dr. Richard Ammon
Dean
Engineering, Math, and Physical
Sciences Division



~~Dr. Richard Keimhofer~~ Sheila Ross
Program Director
Electrical Engineering



Ms. Michelle Leonard
Department Chair
Electrical Engineering Technology