

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

TRANSFER AGREEMENT

between

**Western Technical College
Associate of Applied Science in Electronic and Computer Engineering
Technology**

and

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

Effective Fall 2020

This agreement applies to students entering the Western Technical College AAS-Electronic and Computer Engineering Technology program in Fall 2020 and entering the MSOE® AAS-EET to BSEE Transfer Track in the Electrical Engineering program in Fall 2022.

PURPOSE

Any student who:

- successfully completes the Associate of Applied Science in Electronic and Computer Engineering Technology (ECET) program at Western Technical College (Western),
- successfully completes other specified courses at Western 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 Western student who:

- a) successfully completes all courses in the Electronic and Computer Engineering Technology program at Western with a grade of C or better (not C-) in each course,
- b) successfully completes all other specified courses at Western, 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
Western AAS-ECET Associate of Applied Science in Electronic and Computer Engineering Technology

Reference: WTCS EET Transfer Outcomes Units (11/04/2016); individual units are referenced as indicated

Topical Areas	Western Course Number
1. Written Communication	
a) GS-1001 requirement	10-801-195 or 20-801-201
b) GS-1002 requirement	10-801-197
2. Calculus	20-804-231, 20-804-232*
3. Social Sciences and/or Humanities	10-809-196 10-809-198 or 20-809-231
4. Economics	10-809-195 or 20-809-211 or 20-809-212
5. Science: physics of mechanics (PH-113 equiv.)	10-806-154
6. EE-1000 equivalent	10-660-115
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: transfer functions and Bode Plots (first order circuits), resonant circuits Reference: Units 1-6, 21, 22	10-660-116 10-662-112 10-662-124
8. Electron Devices & Circuits with ECA/equiv.: Diodes, BJTs, FETs, OP-AMPs, other linear ICs; BJT and FET amplifiers: DC bias and small signal mid-band gains and impedances including equation developments, and introduction to transistor amplifier design Reference: Units 7-12, 22	10-660-125 10-662-157 10-662-124
9. Digital Electronics: Number systems, combinational logic functions and devices, logical simplification, sequential logic devices and circuits, other digital devices and circuits Reference: Units 13-16	10-662-137 10-662-134
10. Microprocessors/Microcontrollers: Architecture, algorithm development, programming (preferably in C), interfacing Reference: Unit 17	10-662-134 10-662-153
11. Power and Motor Systems: Motors, generators, three phase power, transformers, intro. to Programmable Logic Controllers (PLCs) Reference: Units 18, 19, 21	10-605-200 10-662-112
12. Programmable Logic Controllers (PLCs): Reference: Unit 20	(currently none)
13. Data Communications and Networking: Reference: Unit 23	10-662-140

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

** The Competencies Required for Admission on this page will be valid for AAS-EET-to-BSEE transfer students who start at MSOE in Fall 2022. However, ultimate transfer credit is uncertain as of the signing of this particular transfer agreement. See Provision 15.

Western Course Listing

(in effect at Western in Fall 2020 for transfer to MSOE in Fall 2022)

Course #	Course Title	Credits	Notes
Semester 1 (Fall)			
10-660-115	DC/AC 1	3	
10-660-116	DC/AC 2	3	
10-801-195	Written Communication	3	
10-804-113*	College Technical Math 1A	3	
10-804-114*	College Technical Math 1B	2	
		14 Credits	
Semester 2 (Spring)			
10-660-125	Electronic Devices	4	
10-662-137	Digital Electronics Concepts	4	
10-804-116*	College Technical Math 2	4	
		12 Credits	
Summer Semester			
10-801-198	Speech***	3	[could take in sem. 1 or 2]
10-801-197	Technical Reporting	3	[Western recommendation: take in sem. 2]
10-809-196	Introduction to Sociology**	3	[could take in sem. 1 or 2]
10-809-198	Introduction to Psychology**	3	[could take in sem. 1 or 2]
		12 Credits	
Semester 3 (Fall)			
10-662-112	DC/AC III	3	[elective slot]
10-662-134	Embedded Systems	4	
10-662-153	Introduction to LabVIEW	2	[co-req. 662-134]
10-662-157	Integrated Circuit Applications	3	
20-804-231	Calculus & Analytic Geometry I	5	(required for transfer to MSOE)
		17 Credits	(credits in parentheses including 804-231)
Semester 4 (Spring)			
10-605-200	Industrial Control Systems	4	
10-662-124	Electronic Circuit Analysis	3	[elective slot]
10-662-138	Communications Systems*	3	
10-806-154	General Physics I	4	
20-804-232	Calculus & Analytic Geometry 2	5	(required for transfer to MSOE)
		19 Credits	(credits in parentheses including 804-232)
Suggested other classes for transfer to MSOE (not required before transfer – can take at MSOE; the calculus courses have higher priority)			
10-809-195 or 20-809-211 or 20-809-212	(Economics)	3	[counts toward AAS transfer to MSOE]
10-662-140	Data Communications and Networking	3	[counts toward AAS transfer to MSOE]
20-806-209	College Chemistry I	5	[transfers as CH-200 to MSOE]
20-804-240	Basic Statistics	4	[transfers as MA-262 to MSOE]
10-809-103	Think Critically & Creatively	3	[transfers as HU-494 to MSOE]
10-809-166	Intro to Ethics: Theory & App	3	[transfers as HU-43X to MSOE]

Note to students: Consult with an EET curriculum faculty advisor at Western Technical College for scheduling these semesters.

*This course is required in the Western AAS-EET program to earn the AAS-EET degree, but does not count toward transfer requirements into the MSOE AAS-EET to BSEE Transfer Track program.

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

***10-801-198 transfers as GS-1003 into BS-level of the MSOE AAS-EET to BSEE Transfer Track program.

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 Western Technical College:

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

10-662-112 DC/AC III

10-662-124 Electronic Circuit Analysis

Identification of the calculus courses by course number and title:

20-804-231 Calculus and Analytic Geometry 1

20-804-232 Calculus and Analytic Geometry 2

15. Informational notice: MSOE is planning to transition from quarters to semesters commencing Fall 2023. The semester-based Electrical Engineering program curriculum at MSOE is currently in development. Hence, precise transfer credit cannot be ascertained for this particular transfer agreement. The intent is not to prolong the stay of any transfer student in the AAS-EET to BSEE transfer track at MSOE beyond the current transfer arrangements, nominally two full-time academic years plus one academic term (which will be a semester instead of a quarter). However, the forthcoming transfer arrangement is not certain and may exceed the current arrangement. An off-track or part-time student will probably require more time at MSOE than the standard arrangement. We will attempt to advise potential transfer students who intend to start in this transfer track in Fall 2022, and who communicate with us, of these circumstances before they enroll in courses at MSOE. In any event, the arrangement should not be referred to as “two-plus-two” (“2+2”).

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 Western Technical College:

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

Michael Poellinger, Associate Dean, Integrated Technology Division, 608-789-6098,
poellingerm@westernnc.edu

Faculty directly responsible for the Western program:

Randal Hytry, Program Head/Instructor Electronic and Computer Engineering
Technology, 608-785-9290, hytryr@westernnc.edu

Person(s) designated to sign off on curriculum changes:

Michael Poellinger, Associate Dean, Integrated Technology Division, 608-789-6098,
poellingerm@westernnc.edu

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

Randal Hytry, Program Head/Instructor Electronic and Computer Engineering
Technology, 608-785-9290, hytryr@westernnc.edu

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

Julie Lemon, Director of Marketing and Communications, 608-785-9890,
lemonj@westernnc.edu

Website address for the institution: <http://www.westernnc.edu>

Website address specific to the EET program: (not currently posted on website)

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

Ms. Samantha Kammers
Director of Non-traditional Admission
414-277-7431
kammers@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/>

Signatories

This agreement, signed and dated this 20 day of May, 2021, has been thoroughly reviewed and approved by both institutions. The agreement is in effect for the 2020 – 2021 academic year.

Milwaukee School of Engineering

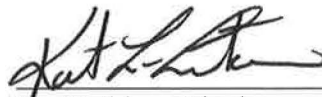
Western Technical College

Dr. John Y. Walz
President



Dr. Roger Stanford
President

Dr. Eric T. Baumgartner
Vice-President of Academics



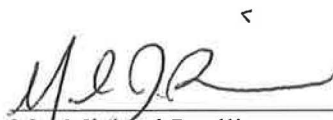
Dr. Kathleen Linaker
Vice-President of Academics

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



Dr. Joshua Gamer
Dean
Integrated Technology Division

Dr. Sheila
Program Director
Electrical Engineering



Mr. Michael Poellinger
Associate Dean
Integrated Technology Division