



# 2023-2024 INDUSTRIAL TRADES PROGRAMS

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Tool and Die Maker • Robotics Technician • Machinery Technician  
Electronics Technician • Maintenance Mechanic  
Heating and Cooling Technician*

**For more information, please visit**  
[kellogg.edu/industrial](https://kellogg.edu/industrial)



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*Rosler has benefited greatly from the customized training that KCC Workforce Solutions has provided for our employees.*

**Bernie Kerschbaum**  
CEO, Rosler Metal Finishing USA, L.L.C.

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- no cost training opportunities and certifications
- networking with employers and local growing industries
- resources for career exploration, referrals and community connections



for more information visit [MichiganWorksSouthwest.org](https://MichiganWorksSouthwest.org)

A proud partner of the American Job Center network. Michigan Works! Southwest is an equal opportunity employer/program supported by the State of Michigan. 1-800-285-WORK (9675). Auxiliary aids and services are available upon request. Dial 711 for Relay Center and TTY. Supported in part with state and/or federal funds.

# REGIONAL MANUFACTURING TECHNOLOGY CENTER

The Regional Manufacturing Technology Center (RMTc) is an innovative, community driven training facility located in Fort Custer Industrial Park in Battle Creek, Michigan. The facility is home to Industrial Trades and Workforce Solutions. Together these departments design training programs using blended learning techniques.

Training programs are designed to meet the employee training needs of area business and industry. The innovative approach to training enables the RMTc to respond to training needs quickly and efficiently. Training is available to individuals on a walk-in basis or can be scheduled to meet production and service schedules and may be provided either at the worksite, at the RMTc, or at any remote location within the community. To find out more about training available through the RMTc, visit [kellogg.edu/rmtc](http://kellogg.edu/rmtc) or call 269-965-4137.

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# REGISTRATION & PROGRAM INFORMATION

KCC Manufacturing, Skilled Trades  
and Applied Technology

## PROGRAMS OF STUDY

### Occupational Associate Degree Programs

- Industrial Electricity  
and Electronics
- Industrial Heating, Ventilation,  
Air Conditioning, Refrigeration
- Industrial Machining Technology
- Industrial Pipefitting
- Industrial Technology
- Industrial Welding
- Skilled Trades

### Certificate Programs

- Industrial Electricity and Electronics
- Industrial Heating, Ventilation,  
Air Conditioning, and Refrigeration
- Industrial Machining Technology
- Industrial Pipefitting
- Industrial Technology
- Industrial Trades
- Industrial Welding
- Renewable Energy

## STUDENTS – GETTING STARTED!

Many Industrial Trades processes and procedures are different from standard KCC processes because of the non-traditional style of instruction. The Industrial Trades Orientation details many of these differences. **Students enrolling in Industrial Trades Programs should follow these steps:**

### Apply to KCC

Apply to KCC by completing an Application for Admissions at [apply.kellogg.edu](http://apply.kellogg.edu). Submit the form at least 24 hours before completing the Next Generation Accuplacer® assessment and registering for modules.

### Admission Criteria:

- Adults 18 years of age or older,
- High school graduates, GED or
- Completion of a home school program

**Important!** *Currently enrolled high school students, or currently enrolled home school students ages 14-17 may apply through Dual Enrollment (additional approvals and/or materials may be required).*

### Admissions Contact Information

Phone — 269.965.4153

Email — [adm@kellogg.edu](mailto:adm@kellogg.edu)

Web — [kellogg.edu/admissions](http://kellogg.edu/admissions)

## Complete the Industrial Trades Orientation

Industrial Trades students are required to complete an Industrial Trades program orientation. There is one orientation module for each of the Industrial Trades Programs. These modules are free and must be done in-person at the trades location attending. The Program Orientation Module is a prerequisite for program modules. Industrial Trades students must meet this prerequisite in order to register for modules within their chosen program of study.

### Industrial Trades Department

Phone — 269.965.4137

Email — [rmtc@kellogg.edu](mailto:rmtc@kellogg.edu)

Web — [kellogg.edu/industrial](http://kellogg.edu/industrial)

## Meet with a Program Instructor

After applying, students should meet with an Industrial Trades program instructor to learn more about the program selected. If considering an Associate in Applied Science, students should meet with academic advisor after meeting with the program instructor and completing the Next Generation Accuplacer® assessment.

KCC academic advisors are available to provide additional information on:

- *Next Generation Accuplacer® assessment*
- *Other KCC programs*
- *Selecting general education courses*
- *Graduation requirements*
- *Navigating the transfer process*
- *Accessing career resources*
- *Seeking college resources*

### Academic Advising Contact Information

Phone — 269.965.4124

Email — [advising@kellogg.edu](mailto:advising@kellogg.edu)

Web — [kellogg.edu/current-students/advising/](http://kellogg.edu/current-students/advising/)

## Apply for Financial Aid

Industrial Trades programs may be covered by financial aid. To determine financial aid eligibility, submit the Free Application for Federal Student Aid (FAFSA) online at least three months prior to the semester in which you plan to start training. This should provide sufficient time to process the application.

Go to [fafsa.gov](http://fafsa.gov) to apply.

Visit [kellogg.edu/admissions/financial-aid](http://kellogg.edu/admissions/financial-aid) for eligibility requirements and information on grants, scholarships, student loans, work-study, and veteran's benefits. All financial aid information will be communicated via the Financial Aid Self Service System located within the KCC Bruin Portal. Students should periodically review financial aid information through the KCC Bruin Portal and watch for emails, which will provide financial aid information.

### Financial Aid & Scholarships

#### Contact Information

Phone — 269.965.4123

Email — [finaid@kellogg.edu](mailto:finaid@kellogg.edu)

Web — [kellogg.edu/admissions/financial-aid](http://kellogg.edu/admissions/financial-aid)

Fill out FAFSA — [fafsa.ed.gov](http://fafsa.ed.gov)

## Complete Assessment Testing

Assessment Testing is not required for Industrial Trades Certificate programs. It is only required for Industrial Trades Associate in Applied Science Degree Programs. Assessment scores are a prerequisite for many general education courses required for an Industrial Trades Associate in Applied Science Degree. Students pursuing a degree are required to complete testing prior to seeking advising.

For more information about testing and available testing hours, please contact the KCC Testing and Assessment office.

### Testing and Assessment Contact Information

Phone — 269.965.4136

Email — [testing@kellogg.edu](mailto:testing@kellogg.edu)

Web — [kellogg.edu/current-students/testing/](http://kellogg.edu/current-students/testing/)

## New Student Orientation

Students pursuing an associate degree must attend a New Student Orientation on Kellogg Community College's North Avenue campus. New Student Orientation helps introduce students to Kellogg Community College and prepare for successful education. Orientation is designed to give students critical information about being a Bruin! Not only is orientation important, but it's a fun way to meet new students and KCC Staff. Orientation occurs the week before classes begin, giving students an opportunity to see the campus and figure out where classrooms, offices are resources are located. For more information or to sign up for orientation contact Student Life at 269-565-2634 or at [StudentLife@kellogg.edu](mailto:StudentLife@kellogg.edu).

## Register for Modules

Students can register for modules any of the following ways:

- In person (recommended)
- By email to [rmtc@kellogg.edu](mailto:rmtc@kellogg.edu)
- By fax to 269-962-7370

Please see [kellogg.edu/about/departments/industrial/documents](http://kellogg.edu/about/departments/industrial/documents) for additional information and required registration forms and/or documentation.

**Important!** See the Registrar's Office webpage at [kellogg.edu/admissions/registrar/tuition/address-verification](http://kellogg.edu/admissions/registrar/tuition/address-verification) for acceptable documentation for proving your residency.

## Pay for Modules

Students (including those with awarded financial aid) have two payment options:

1. Payment in full when registering
2. Enrollment in the payment plan

After registering for classes students have 24 hours to pay in full or enroll in the Payment Plan. Failure to pay in full or enroll in the payment plan will result in classes being dropped. To enroll in the payment plan, login to the Bruin Portal and choose the Student Finance option in the Self Service Section.

*Important! In order to take advantage of this payment plan, students must register during traditional registration periods.*

### Records and Registration

Phone — 269.965.5522

Email — [regoffice@kellogg.edu](mailto:regoffice@kellogg.edu)

Web — [kellogg.edu/admissions/registrar](http://kellogg.edu/admissions/registrar)

### Business Office

Phone — 269.965.4140

Email — [busoffice@kellogg.edu](mailto:busoffice@kellogg.edu)

## INDUSTRIAL TRADES

The Industrial Trades program design offers an innovative, non-traditional style of training which incorporates competency-based modules, individualized instruction, and self-paced learning. Modules are credit-based and may lead to a certificate or an associate in applied science. Students may also be granted prior experiential learning.

### Competency-based Modules

Modules are short, topical courses—generally between 5 and 25 clock hours in length. Modules are taken in successive order. Competency-based means students must achieve the minimum score (80%, 90%, or 100%) to pass the module. Students must pass each successive module before starting the next.

### Individualized Instruction

Industrial Trades instruction is instructor facilitated instead of instructor led. Each module contains a list of learning activities which may include reading technical manuals or text books, watching videos, completing online curricula, viewing presentations, completing written exercises, completing hands-on lab activities,

and completing written or lab-based assessments. Instructors provide one-on-one instruction to individual students as they work through these learning activities.

### Open Entry/Open Exit

Please see the lab schedule for open lab hours. Students may attend at any time during these open lab hours to work on their modules, do testing, or do hands-on lab activities for their modules. Students work through modules and learning activities at their own pace within a traditional semester. Students may register for modules at almost any time during the semester. If a student cannot complete a module during the semester in which they enroll, the student can speak to their instructor to see if an incomplete grade can be granted (this is up to the instructor's discretion). If an incomplete is granted, the student and instructor will fill out an incomplete contract, providing the student with up to a one year time extension to complete the module. The length of the time extension will be determined by the instructor when filling out the contract with the student, and be reflected in the contract.

### Credit-based

All Industrial Trades modules are credit-based, which means students earn college credit for each module successfully completed. For every 24 hours of instruction, students earn one college credit hour. The credit hours and contact hours for each module are listed on the program outlines. Minimum credit requirements for certificates vary by program.

### Prior Experience

Students may be granted credit for prior learning or work experience. Many Industrial Trades students have extensive knowledge and skills, which may be equivalent to the knowledge and skills taught at the RMTTC. In these cases students may apply for prior experiential credit. Students should discuss all prior learning and experience with the RMTTC program instructor prior to enrollment.

### Transfer Options

Students that have completed an Associate in Applied Science degree at KCC may have options to transfer directly to a four year institution. See an Academic Advisor for more information.



## YOUTH TRAINING OPPORTUNITIES

The RMTC works closely with both the Branch Area Careers Center and the Calhoun Area Career Center to ensure youth have pathways to manufacturing careers. Pathways may include articulation and dual enrollment.

### Articulation: Earn College Credit in High School

Students interested in pursuing a career in Industrials Trades are encouraged to enroll in a program at one of the career centers during high school. Courses taken at the career centers may be articulated with the RMTC, which means high schools students may earn college credit for courses taken prior to graduation. Students must pass a KCC academic course successfully prior to being awarded articulated credit.

### Dual Enrollment/Early College

High school students may also dual enroll at the RMTC. [Dual Enrolled/Early College](#) students attend the RMTC and earn college credit, while they are still in High School. Dedicated students can graduate from high school and an Industrial Trades program at the same time. It is important for these students to remember that the RMTC is a college-level learning environment. Its self-paced model of education delivery offers great flexibility for students, but also requires a high level of self-direction to be successful in moving through a program path. High schools with students attending the RMTC are encouraged to establish a monitoring process to make sure they are making adequate progress. KCC has an online portal through which student can track progress and make this information available to the appropriate high school personnel. For more information on youth training programs, contact the RMTC at 269-965-4137.

## APPRENTICESHIP

The RMTC works with the regional U.S. Department of Labor Office of Apprenticeship to assist companies in designing, registering, and implementing apprenticeship programs. For more information on apprenticeships, contact Julia Faist [faistj@kellogg.edu](mailto:faistj@kellogg.edu).

### Apprenticeship Curricula

Industrial Trades curricula at the RMTC are

recognized by the U.S. Department of Labor Office of Apprenticeship for registered apprenticeship programs and are used by many regional companies for related training instruction. All Industrial Trades core curricula may be used to develop an apprenticeship program:

- *Industrial Electricity and Electronics (INEL)*
- *Industrial Heating, Ventilation, Air Conditioning and Refrigeration (INHR)*
- *Instrumentation (INST)*
- *Industrial Technology (INT)*
- *Industrial Machining Technology (INMT)*
- *Industrial Pipefitting (INPF)*
- *Renewable Energy (INRE)*
- *Industrial Tool and Die (INTD)*
- *Industrial Welding (INWE)*

### Apprenticeship Programs

Apprenticeship programs are registered by companies. Students enrolled in apprenticeship programs are employed and sponsored by the registering companies. These programs are generally four years long and consist of 8,000 hours of on-the-job training and a minimum 576 hours of related training instruction. Successful completion of these programs will result in an apprenticeship certificate from the Office of Apprenticeship. Faculty at the Regional Manufacturing Technology Center will help companies develop apprenticeship programs or update existing apprenticeship programs to meet today's changing industrial standards.

### State of Michigan Electrical Licensing Requirements

Students enrolled in electrical apprenticeship programs must also be registered with the State of Michigan in order to earn an Electrical License from the State of Michigan. Contact Tim Krueger at [kruegerti@kellogg.edu](mailto:kruegerti@kellogg.edu) to learn more about state licensing requirements.

## CUSTOMIZED TRAINING FOR COMPANIES

The RMTC's unique style of training was designed specifically for the demanding and dynamic manufacturing environment. The Industrial Trades programs provide a variety of training options to meet production and skilled trades training needs. The format enables companies to quickly and efficiently manage the training process. The process includes designing a training program, setting up a training account, enrolling employees in training, and monitoring employee training progress.

## Design a Training Program

The topical, competency-based modules enable manufacturers to quickly and efficiently design custom training programs to meet their unique training needs with no design costs. RMTC faculty is available to consult with companies and to provide guidance on selecting modules to meet identified learning outcomes.

## Setup a Training Account

To set up a company sponsored training program, contact the Executive Director of the RMTC at 269-565-2800. The Executive Director will coordinate a meeting between RMTC faculty and company subject matter experts to outline a training program. This process may be completed in as little as 24-48 hours.

## Enroll Employees

Enrolling employees in a sponsored training program is just as simple. The open entry open exit format enables companies to start students at any time during the semester, without waiting for the next semester to start. It also enables companies to plan training around production schedules. To enroll an employee in a training program, both the student and the sponsor must complete the Sponsored Student Billing Authorization form. Companies are invoiced when the student enrolls in the modules.

## Monitor Training Progress

Companies are making an investment in training and in order to help companies manage their investment, the RMTC emails progress reports at the end of each semester. In order to receive an emailed progress report, the company contact must complete a Student Progress Report Email Agreement form.

## THE GRADE OF "P" (PASS)

An "P" grade will be awarded when the student successfully completes an Industrial Trades module according to the grading criteria specified on the module syllabus. You should be aware that a "P" grade is not calculated in your overall grade point average. This means students taking only Industrial Trades modules will not carry a grade point average. Students taking a combination of Industrial Trades modules and other KCC courses will carry a grade point average calculated entirely upon the grades obtained in those other KCC courses. The grade point average requirement for graduation is waived for all Industrial Trades certificate programs.

## THE GRADE OF "I" (INCOMPLETE)

Students may speak to their instructor prior to the end of the semester if they wish to be considered for an incomplete grade for any unfinished registered modules for that semester. An incomplete grade grants the student a time extension of up to a year to complete the module. Please refer to the College's Operating Policy and Procedure OP 26.003 for more information.

*IMPORTANT! Students cannot register for any additional modules if there are active incomplete grades on their account, until those incomplete grades have been resolved.*

## THE GRADE OF "N" (NO CREDIT)

An "N" grade will be assigned for any unfinished modules at the end of the semester, if no incomplete contract was completed. If a "N" grade is assigned, a student must re-register and repay for the module in order to continue working on it.

*IMPORTANT! Industrial Trades modules may not transfer to all other educational institutions. If you are planning to transfer to another educational institution, students should speak with an academic advisor from the transfer institution regarding transferability of Industrial Trades modules. For more information on transferability, contact the RMTC at 269-965-4137.*

## DROPS AND WITHDRAWALS

Students may drop or withdraw from a module during different periods. Drop and withdrawal periods are found on the lab schedule each semester. When dropping modules, students are not financially responsible for the courses. When withdrawing from modules, students are financially responsible for the courses. Withdrawing from courses affects Satisfactory Academic Progress (SAP) for financial aid recipients.

## SATISFACTORY ACADEMIC PROGRESS STANDARDS

All students receiving financial aid from federal and state sources must maintain Satisfactory Academic Progress (SAP) at Kellogg Community College. For more information, please visit [kellogg.edu/financial-aid](http://kellogg.edu/financial-aid).



## Program Information

# INDUSTRIAL ELECTRICITY & ELECTRONICS

### Offered at the Regional Manufacturing Technology Center

For complete information  
visit [kellogg.edu/industrial](http://kellogg.edu/industrial)

Associate in Applied Science:  
**60 Credits**

Certificate: **30 Credits**

Students enrolled in an Industrial Electricity and Electronics program will learn electrical safety, mathematics for electricians, electrical theory, the national electrical code, electrical motor controls, power distribution systems, facility maintenance, electrical control wiring, industrial electronics, and programmable logic controllers.

**TIM KRUEGER** *Professor*  
269-565-2818  
[kruegerti@kellogg.edu](mailto:kruegerti@kellogg.edu)

**DUSTY MOTT** *Instructional Assistant,  
Electricity/Electronics*  
269-565-2856  
[mottd@kellogg.edu](mailto:mottd@kellogg.edu)

**NOTE: Program information subject to  
change without notice. Call to verify  
current information 269-965-4137.**

SUBJECT/COURSE#	TITLE	CREDIT HOURS	CONTACT HOURS
INEL C910	<b>Electric Electronics Orientation</b>		2.0
INEL 05010	<b>Electrical Safety</b>	0.17	4.0
INEL 10010	<b>Electrical Math 1</b>	0.08	2.0
INEL 10020	<b>Electrical Math 2</b>	0.25	6.0
INEL 10030	<b>Electrical Math 3</b>	0.25	6.0
INEL 15010	<b>Electrical Theory</b>	0.25	6.0
INEL 15020	<b>Static Electricity</b>	0.25	6.0
INEL 15030	<b>Calculators and Electronics</b>	0.25	6.0
INEL 15040	<b>Devices and Symbols</b>	0.25	6.0
INEL 15050	<b>Multimeter</b>	0.33	8.0
INEL 15060	<b>Ohm's Law</b>	0.33	8.0
INEL 15070	<b>Series Circuits</b>	0.33	8.0
INEL 15080	<b>Parallel Circuits</b>	0.33	8.0
INEL 15090	<b>Combination Circuits</b>	0.33	8.0
INEL 15100	<b>Magnetism</b>	0.25	6.0
INEL 15110	<b>Alternating Current</b>	0.25	6.0
INEL 15120	<b>Oscilloscope</b>	0.33	8.0
INEL 15130	<b>Inductance</b>	0.42	10.0
INEL 15140	<b>Capacitance</b>	0.42	10.0
INEL 15150	<b>RLC Circuits</b>	0.33	8.0
INEL 15160	<b>Conduction</b>	0.33	8.0
INEL 15170	<b>Theory Overview</b>	0.21	5.0
INEL 20010	<b>Electrical Motor Controls</b>	0.42	10.0
INEL 20020	<b>Manual Motor Controls</b>	0.50	12.0
INEL 20030	<b>Control Transformers</b>	0.42	10.0
INEL 20040	<b>Control Ladder Logic</b>	0.67	16.0
INEL 20050	<b>Control Relays Motor Starters</b>	0.50	12.0
INEL 20060	<b>Introduction Troubleshooting</b>	0.33	8.0
INEL 20070	<b>Systems Troubleshooting</b>	0.42	10.0
INEL 20080	<b>Automatic Input Devices</b>	0.42	10.0
INEL 20090	<b>Electronic Sensors</b>	0.33	8.0
INEL 20100	<b>Basic Timer Control</b>	0.33	8.0
INEL 20110	<b>Timers and Counters</b>	0.25	6.0
INEL 25010	<b>Reversing Motor Control</b>	0.33	8.0
INEL 25020	<b>Braking Methods</b>	0.42	10.0
INEL 25030	<b>Reduced Voltage Starting</b>	0.33	8.0
INEL 25040	<b>Intro Frequency Drives (AC)</b>	0.33	8.0
INEL 25050	<b>AC Drives Speed Torque Cnt</b>	0.33	8.0
INEL 25060	<b>AC Drives Accel and Decel</b>	0.33	8.0

<b>SUBJECT/COURSE#</b>	<b>TITLE</b>	<b>CREDIT HOURS</b>	<b>CONTACT HOURS</b>	<b>SUBJECT/COURSE#</b>	<b>TITLE</b>	<b>CREDIT HOURS</b>	<b>CONTACT HOURS</b>
INEL 25070	<b>AC Drives Troubleshooting</b>	0.38	8.0	INEL 45080	<b>3 Phase Transformers</b>	0.50	12.0
INEL 25080	<b>SCR Motor Control</b>	0.42	10.0	INEL 45090	<b>NEC Transformer Requirements</b>	0.25	6.0
INEL 30010	<b>DC Series Motors</b>	0.25	6.0	INEL 45100	<b>Emergency Electrical Systems</b>	0.25	6.0
INEL 30020	<b>DC Shunt and Compound Motors</b>	0.33	8.0	INEL 45110	<b>Class B Fire Alarm Systems</b>	0.33	8.0
INEL 30030	<b>Motor Speed and Torque</b>	0.33	8.0	INEL 45115	<b>Advanced Fire Alarm Systems</b>	0.42	10.0
INEL 30040	<b>Motor Performance</b>	0.25	6.0	INEL 50010	<b>Electrical Control Wiring</b>	0.42	10.0
INEL 30050	<b>Split Phase Motors</b>	0.25	6.0	INEL 50020	<b>Electrical Control Systems</b>	1.00	24.0
INEL 30060	<b>Capacitor Start Motors</b>	0.25	6.0	INEL 55010	<b>Using the Oscilloscope</b>	0.67	16.0
INEL 30070	<b>Permanent Capacitor Motors</b>	0.25	6.0	INEL 55020	<b>Meters for Electronics</b>	0.33	8.0
INEL 30080	<b>Three Phase Motors</b>	0.33	8.0	INEL 55030	<b>Electronic Soldering</b>	0.25	6.0
INEL 35010	<b>General Wiring Fundamentals</b>	0.25	6.0	INEL 55040	<b>Soldering Printed Circuit Boar</b>	0.25	6.0
INEL 35020	<b>Wire Raceway and Box Sizing</b>	0.33	8.0	INEL 55050	<b>Diodes</b>	0.25	6.0
INEL 35030	<b>Branch Circuits</b>	0.33	8.0	INEL 55060	<b>Power Supplies</b>	0.50	12.0
INEL 35040	<b>Service Feeder Calculations</b>	0.25	6.0	INEL 55070	<b>Photo Devices</b>	0.33	8.0
INEL 35050	<b>Grounding and Bonding</b>	0.33	8.0	INEL 55080	<b>Solid State Devices</b>	0.83	20.0
INEL 35060	<b>Overcurrent Protection</b>	0.33	8.0	INEL 55090	<b>Electronic Timing</b>	0.33	8.0
INEL 35070	<b>Motor Circuit Wiring</b>	0.25	6.0	INEL 55100	<b>Amplifiers</b>	0.83	20.0
INEL 35080	<b>Transformers</b>	0.25	6.0	INEL 55110	<b>Digital Logic Fundamentals</b>	0.50	12.0
INEL 35090	<b>General Hazardous Locations</b>	0.25	6.0	INEL 55120	<b>Digital Logic Applications</b>	0.42	10.0
INEL 35100	<b>Health Care Facilities</b>	0.25	6.0	INEL 55130	<b>Proximity Switching</b>	0.17	4.0
INEL 35110	<b>Emergency Power Systems</b>	0.33	8.0	INEL 55140	<b>Photoelectric Devices</b>	0.17	4.0
INEL 35120	<b>Industrial Applications</b>	0.33	8.0	INEL 55150	<b>Fiber Optic Fundamentals</b>	0.33	8.0
INEL 35130	<b>Special Application Wiring</b>	0.25	6.0	INEL 55160	<b>Fiber Optic Lab</b>	0.25	6.0
INEL 35140	<b>NEC Review</b>	0.17	4.0	INEL 60010	<b>Intro Programmable Controllers</b>	0.25	6.0
INEL 40010	<b>Power Generation Distribution</b>	0.33	8.0	INEL 60020	<b>Basic PLC Programming</b>	0.50	12.0
INEL 40020	<b>Electrical Wiring Techniques</b>	0.33	8.0	INEL 60030	<b>PLC Motor Control</b>	0.50	12.0
INEL 40030	<b>Wiring System Installation</b>	0.42	10.0	INEL 60040	<b>Discrete I/O Interfacing</b>	0.33	8.0
INEL 40040	<b>Introduction to Raceways</b>	0.42	10.0	INEL 60050	<b>Intro to PLC Troubleshooting</b>	0.33	8.0
INEL 40050	<b>Basic Conduit Bending</b>	0.25	6.0	INEL 60060	<b>PLC Systems Troubleshooting</b>	0.33	8.0
INEL 40060	<b>Advanced Raceways</b>	0.25	6.0	INEL 65010	<b>Event Sequencing</b>	0.33	8.0
INEL 40070	<b>Conductor Overcurrent Protect</b>	0.25	6.0	INEL 65020	<b>Application Development</b>	0.50	12.0
INEL 40080	<b>Conduit Sizing Wire Pulling</b>	0.33	8.0	INEL 65030	<b>PLC Timer Instructions</b>	0.50	12.0
INEL 45010	<b>Plans and Site Work</b>	0.25	6.0	INEL 65040	<b>PLC Counter Instructions</b>	0.50	12.0
INEL 45020	<b>Industrial Power Systems</b>	0.42	10.0	INEL 65050	<b>Program Control Instructions</b>	0.50	12.0
INEL 45030	<b>Signaling Systems</b>	0.25	6.0	INEL 65060	<b>Math Data Move Instructions</b>	0.58	14.0
INEL 45040	<b>Motors Controllers Installation</b>	0.33	8.0	INEL 67010	<b>Siemens 300 Intro to PLCs</b>	0.50	12.0
INEL 45050	<b>Special Equipment &amp; HVAC</b>	0.33	8.0	INEL 67020	<b>Siemens 300 Basic PLC Program</b>	0.50	12.0
INEL 45060	<b>Industrial Hazardous Locations</b>	0.25	6.0	INEL 67030	<b>Siemens 300 PLC Motor Control</b>	0.50	12.0
INEL 45070	<b>Single Phase Transformers</b>	0.33	8.0	INEL 67040	<b>Siemens 300 IO Interfacing</b>	0.50	12.0

<b>SUBJECT/COURSE#</b>	<b>TITLE</b>	<b>CREDIT HOURS</b>	<b>CONTACT HOURS</b>
INEL 67050	<b>Siemens 300 PLC Timers</b>	0.50	12.0
INEL 67060	<b>Siemens 300 PLC Counters</b>	0.50	12.0
INEL 75010	<b>Intro to Compact Logix PLCs</b>	0.25	6.0
INEL 75020	<b>Creating RS Logix 5000 Projec</b>	0.25	6.0
INEL 75030	<b>Ethernet Communication Proto</b>	0.42	10.0
INEL 75040	<b>Creating RS Logix 5000 Progra</b>	0.42	10.0
INEL 75050	<b>TON TOF RTO Counter Instructi</b>	0.42	10.0
INEL 75060	<b>CU and CD Counter Instruction</b>	0.42	10.0
INEL 70010	<b>Introduction to Panel View</b>	0.17	4.0
INEL 70020	<b>Terminal Overview</b>	0.25	6.0
INEL 70030	<b>Wiring and Set Up</b>	0.25	6.0
INEL 70040	<b>Terminal Configuration</b>	0.25	6.0
INEL 70050	<b>Troubleshooting Maintenance</b>	0.25	6.0
INEL 70060	<b>Programming Panel View</b>	0.83	20.0
INEL 70070	<b>Panel View PLC Applications</b>	1.04	25.0
INEL 70080	<b>Panel View PLC Communication</b>	0.21	5.0
INEL 80010	<b>Introduction Machine Safety</b>	0.33	8.0
INEL 80020	<b>Level 1 Machine Safety</b>	0.25	6.0
INEL 80030	<b>Level 2 Machine Safety</b>	0.42	10.0
INEL 80040	<b>Level 3 Machine Safety</b>	0.50	12.0
INEL 80050	<b>Machine Survey</b>	0.33	8.0
INEL 95010	<b>Mechatronics Automation Oper</b>	0.21	5.0
INEL 95020	<b>Mechatronics Basic Comp Adj</b>	0.21	5.0
INEL 95030	<b>Mechatronics Pick Place Feed</b>	0.21	5.0
INEL 95040	<b>Mechatronics Gauging</b>	0.21	5.0
INEL 95050	<b>Mechatronics Indexing</b>	0.21	5.0
INEL 95060	<b>Mechatronics Sorting Queuing</b>	0.21	5.0
INEL 95070	<b>Mechatronics Servo Robotic</b>	0.21	5.0
INEL 95080	<b>Mechatronics Torqueing</b>	0.21	5.0
INEL 95090	<b>Mechatronics Parts Storage</b>	0.21	5.0
INEL 95095	<b>Mechatronics Station Program</b>	0.21	5.0
INEL 95100	<b>Mechatronics Multi Station Cn</b>	0.21	5.0

## Program Information

# HVAC-R INDUSTRIAL HEATING, VENTILATION, AIR CONDITIONING AND REFRIGERATION

## Offered at the Regional Manufacturing Technology Center

For complete information  
visit [kellogg.edu/industrial](http://kellogg.edu/industrial)

Associate in Applied Science:  
**60 Credits**  
Certificate: **25 Credits**

Students enrolled in an Industrial HVAC-R program at the RMTC will learn refrigeration tools & plant safety, refrigeration fundamentals, electrical fundamentals for HVAC/R, refrigeration systems & components, EPA standards and certification, heating systems & troubleshooting, hydronic systems, steam systems, heat pumps & troubleshooting, air distribution & indoor air quality, HVAC-R automation controls, HVAC-R duct systems, HVAC-R preventative maintenance, commissioning & conservation, water treatment, supervisory skills, and writing for employment.

**ANDREW REDLON** *Professor*  
269-565-2813  
[redlona@kellogg.edu](mailto:redlona@kellogg.edu)

**NOTE: Program information subject to change without notice. Call to verify current information 269-965-4137.**

SUBJECT/COURSE#	TITLE	CREDIT HOURS	CONTACT HOURS
INHR C910	<b>HVAC-R Orientation</b>		2.0
INHR 05011	<b>HVAC-R Safety</b>	0.83	20.0
INHR 05021	<b>HVAC-R Tools</b>	0.08	2.0
INHR 10011	<b>Introduction to HVAC-R</b>	0.33	8.0
INHR 10021	<b>Trade Mathematics</b>	0.42	10.0
INHR 10031	<b>Copper Plastic Piping Practice</b>	0.21	5.0
INHR 10041	<b>Soldering and Brazing</b>	0.33	8.0
INHR 10051	<b>Ferrous Metal Piping Practices</b>	0.63	15.0
INHR 12011	<b>Elec Safety &amp; Hazard Awareness</b>	0.33	8.0
INHR 12021	<b>Basic Elec Theory &amp; Terminology</b>	0.67	16.0
INHR 12031	<b>Basic Electrical Circuits</b>	0.50	12.0
INHR 12041	<b>Electrical Measurement</b>	0.50	12.0
INHR 12051	<b>Circuit Analysis</b>	1.00	24.0
INHR 12061	<b>Inductance &amp; Capacitance</b>	0.67	16.0
INHR 12071	<b>Combination Circuits</b>	0.50	12.0
INHR 12081	<b>Transformers</b>	0.50	12.0
INHR 12091	<b>Fuses &amp; Circuit Breakers</b>	0.25	6.0
INHR 12101	<b>Relays &amp; Contactors</b>	0.25	6.0
INHR 12111	<b>Magnetism and AC Fundamentals</b>	0.50	12.0
INHR 12121	<b>Electric Motors &amp; Controls</b>	0.50	12.0
INHR 12131	<b>Symbols and Wiring Diagrams</b>	0.50	12.0
INHR 15011	<b>Introduction to Cooling</b>	1.25	30.0
INHR 15021	<b>Compressors</b>	0.63	15.0
INHR 15031	<b>Refrigerants and Oils</b>	0.42	10.0
INHR 15041	<b>Metering Devices</b>	0.33	8.0
INHR 15051	<b>Leak Evac Recovery Charging</b>	0.83	20.0
INHR 15061	<b>Troubleshooting Cooling</b>	0.83	20.0
INHR 15071	<b>Retail Refrigeration Systems</b>	0.83	20.0
INHR 15081	<b>Commercial Industrial Refrig</b>	1.00	24.0
*INHR C410	<b>EPA Certification</b>		3.0
INHR 20011	<b>Introduction to Heating</b>	0.63	15.0
INHR 20021	<b>Troubleshooting Gas Heating</b>	0.54	13.0
INHR 20031	<b>Troubleshooting Oil Heat Sys</b>	0.42	10.0
INHR 20041	<b>Chimneys, Vents and Flues</b>	0.21	5.0
INHR 20051	<b>Troubleshooting Accessories</b>	0.42	10.0
INHR 25011	<b>Introduction Hydronic Systems</b>	0.42	10.0
INHR 25021	<b>Commercial Hydronic Systems</b>	0.54	13.0
INHR 30011	<b>Steam Systems</b>	0.63	15.0
INHR 35011	<b>Heat Pumps</b>	0.83	20.0

<b>SUBJECT/COURSE#</b>	<b>TITLE</b>	<b>CREDIT HOURS</b>	<b>CONTACT HOURS</b>
INHR 35021	<b>Troubleshooting Heat Pumps</b>	0.54	13.0
INHR 40011	<b>Indoor Air Quality</b>	0.63	15.0
INHR 40021	<b>Air Distribution Systems</b>	0.63	15.0
INHR 40031	<b>Commercial Airside Systems</b>	0.54	13.0
INHR 40041	<b>Air Quality Equipment</b>	0.33	8.0
INHR 40051	<b>System Balancing</b>	0.83	20.0
INHR 45011	<b>Digital Controls HVAC Techs</b>	0.21	5.0
INHR 45021	<b>Building Management Systems</b>	0.75	18.0
INHR 50011	<b>Sheet Metal Duct Systems</b>	0.42	10.0
INHR 50021	<b>Fiberglass Flexible Duct Sys</b>	0.21	5.0
INHR 55011	<b>Installation and Maintenance</b>	0.92	22.0
INHR 55021	<b>Planned Maintenance</b>	0.83	20.0
INHR 55031	<b>Construction Drawings Specifi</b>	1.04	25.0
INHR 60011	<b>System Startup and Shutdown</b>	0.96	23.0
INHR 60021	<b>Heating Cooling System Design</b>	1.04	25.0
INHR 60031	<b>Energy Conservation Equipment</b>	0.42	10.0
INHR 60041	<b>Alternative Heat Cool Systems</b>	0.42	10.0
INHR 65011	<b>Water Treatment</b>	0.42	10.0
INHR 70011	<b>Intro to Supervisory Skills</b>	0.63	15.0
INHR 75011	<b>Writing for Employment</b>	0.50	12.0

*\*Module cannot be paid for using certain types of financial aid. Please direct all inquiries to the staff at the RMTC registration desk.*



## Program Information

# INDUSTRIAL TECHNOLOGY

### Offered at the Regional Manufacturing Technology Center

For complete information  
visit [kellogg.edu/industrial](http://kellogg.edu/industrial)

Associate in Applied Science:

**60 Credits**

Certificate: **30 Credits**

Students enrolled in an Industrial Technology program will learn mathematics, applied science and materials, product design elements, standards and regulations, process applications and operations, electro-mechanical devices, equipment and safety, programming and controls, maintenance systems design and development, and quality and lean manufacturing.

**Matthew Cronkhite** *Instructor*

269-565-7854

[cronkhitem@kellogg.edu](mailto:cronkhitem@kellogg.edu)

**NOTE: Program information subject to change without notice. Call to verify current information 269-965-4137.**

SUBJECT/COURSE#	TITLE	CREDIT HOURS	CONTACT HOURS
INT C910	Ind Technology Orientation		2.0
INT 05010	Plane Geometry Lines Angles	0.58	14.0
INT 05020	Plane Geometry Triangles	0.42	10.0
INT 05030	Plane Geometry Circles	0.42	10.0
INT 05040	Plane Geometry Construct Revie	0.38	9.0
INT 05050	Geometric Figures Areas	0.58	14.0
INT 05060	Geometric Figures Volumes	0.46	11.0
INT 05070	Geometric Figure Areas Volumes	0.25	6.0
INT 05080	Trig Functions Triangle Calc	0.58	14.0
INT 05090	Trig Machine Applications	0.42	10.0
INT 05100	Solving Oblique Triangles	0.50	12.0
INT 05110	Trig Achievement Review	0.33	8.0
INT 10010	Principles of Ferrous Metals	0.63	15.0
INT 10020	Principles Non Ferrous Metals	0.63	15.0
INT 10030	Principles of Plastics	0.42	10.0
INT 10040	Principles of Ceramics	0.42	10.0
INT 10050	Principles of Composites	0.42	10.0
INT 10060	Statics and Data Acquisition	0.42	10.0
INT 10070	Thermodyn Energy Heat Transfer	1.00	24.0
INT 10080	Dynamics Force and Motion	1.13	27.0
INT 10090	Fluids	0.33	8.0
INT 15010	Fundamentals of Print Reading	0.92	22.0
INT 15020	Machine Prints	0.17	4.0
INT 15030	Electrical Prints	0.29	7.0
INT 15040	Hydraulic Pneumatic Print	0.29	7.0
INT 15050	Welding Prints	0.08	2.0
INT 15060	Piping Plumbing Prints	0.21	5.0
INT 15070	AC Refrige Sheet Metal Print	0.21	5.0
INT 15080	Building Prints	0.08	2.0
INT 15090	Geometric Dimension Tolerance	0.17	4.0
INT 20010	Intro Manufacturing Standards	0.13	3.0
INT 20020	Overview of Standards Develop	0.33	8.0
INT 20030	Standards Legal Issues	0.13	3.0
INT 20040	Good Manufacturing Practice	0.21	5.0
INT 25010	Mfg Process Production Basic	0.63	15.0
INT 25020	Production Machine Operations	0.79	19.0
INT 30010	Manufacturing Safety	1.00	24.0
INT 30020	OSHA 10	0.92	22.0
INT 30030	OSHA 30	1.79	43.0
INT 30040	Arc Flash Lockout Tagout	0.29	7.0
INT 30050	Electromechanical Device Equip	1.08	26.0

SUBJECT/COURSE#	TITLE	CREDIT HOURS	CONTACT HOURS	SUBJECT/COURSE#	TITLE	CREDIT HOURS	CONTACT HOURS
INT 30060	Intro to Power Transmissions	0.13	3.0	INT 40020	Ind Maintenance Troubleshootin	0.92	22.0
INT 30070	Couplings	0.17	4.0	INT 40030	Preventive Predictive Mainten	1.25	30.0
INT 30080	Clutches and Brakes	0.33	8.0	INT 40040	Fundamentals Hydraulic Circuit	0.33	8.0
INT 30090	Flat Belt Drives	0.25	6.0	INT 40050	Hydraulic Fluids	0.33	8.0
INT 30100	V Belt Drives	0.25	6.0	INT 40060	Control Valves	0.33	8.0
INT 30110	Chain Drives	0.25	6.0	INT 40070	Flow Control Valves Circuits	0.33	8.0
INT 30120	Speed Reducers	0.25	6.0	INT 40080	Actuators	0.33	8.0
INT 30130	Gears	0.25	6.0	INT 40090	Valves	0.33	8.0
INT 30140	Lubricants and Lubrication	0.17	4.0	INT 40100	Hydraulic Circuits	0.33	8.0
INT 30150	Additives Lub Act Bearing Lub	0.08	2.0	INT 40110	Remote Control Filtration Trbl	0.33	8.0
INT 30160	Oils and Their Applications	0.08	2.0	INT 40120	Facts About Air	0.33	8.0
INT 30170	General Special Purpose Grease	0.17	4.0	INT 40130	Air Preparation	0.33	8.0
INT 30190	Lubricating Systems Methods	0.13	3.0	INT 40140	Air Piping	0.33	8.0
INT 30200	Lubricant Storage and Handling	0.08	2.0	INT 40150	Pneumatic Actuators	0.33	8.0
INT 30210	Nomenclature Types of Bearing	0.17	4.0	INT 40160	Pneumatic Valves	0.33	8.0
INT 30220	Handling and Storing Bearings	0.08	2.0	INT 40170	Pneumatic Cylinder Speed Cntrl	0.33	8.0
INT 30230	Bearing Installation Removal	0.50	12.0	INT 40180	Pneumatic Troubleshooting	0.33	8.0
INT 30240	Bearing Lubrication and Seals	0.25	6.0	INT 45010	Introduction to Quality	1.71	41.0
INT 30250	Troubleshoot Bearing Failure	0.21	5.0	INT 45020	Costs and Tools of Quality	1.71	41.0
INT 30260	Rigging Safety Weight Estimate	0.13	3.0	INT 45030	Quality Systems Lean Mfg	0.67	16.0
INT 30270	Rigging Safety Wire Rope Sling	0.13	3.0	INT 45040	5S System	0.33	8.0
INT 30280	Rig Safety Fiber Rope Slings	0.38	9.0	INT 45050	Tpm Poka Yoke and Lean Theory	0.45	11.0
INT 30290	Rigging Safety Chain Slings	0.08	2.0	INT 45060	Lean Visual Workplace Kaizen	0.29	7.0
INT 30300	Rigging Safety Hoists Cranes	0.21	5.0	INT 45070	Value Stream Mapping Setup Red	0.38	9.0
INT 30310	Rigging Safety Hand Signals	0.13	3.0	INT 45080	Metrology	0.29	7.0
INT 30320	Hand and Power Tools	0.67	16.0	INT 45090	Machine Vision	1.38	33.0
INT 30330	Forklift Safety	0.17	4.0	*INT C410	MSSC Certified Production Tec		6.0
INT 35010	Introduction to Robotics	0.67	16.0	*INT C420	MSSC Safety Assessment		1.5
INT 35020	Robot Programming	1.29	31.0	*INT C430	MSSC Quality Assessment		1.5
INT 35030	Robot Programming FANUC	0.75	18.0	*INT C440	MSSC Mfg Processes Assessment		1.5
INT 35035	Robot Programming Motoman	1.67	40.0	*INT C450	MSSC Maintenance Assessment		1.5
INT 35045	Robot Online Program ABB IRC5	1.00	24.0	*INT C460	ASQ Quality Inspector Cert		4.0
INT 35060	Robot Online Program DENSO	0.42	10.0	*INT C470	ASQ Quality Process Analyst		4.0
INT 35070	Robot Offline Program FANUC	0.58	14.0	*INT C480	ASQ Quality Improvement Assoc		3.0
INT 35080	Robot Offline Program Denso	0.83	20.0	*INT C490	SME CMfgT Pre-Test		3.0
INT 35085	Robot Offline Program Motoman	1.00	24.0	*INT C500	SME CMfgT Certification		3.0
INT 35090	Robotic Maint PM Troubleshoot	1.04	25.0				
INT 35100	Robotics Integration with PLC	0.63	15.0				
INT 35105	Ethernet Networking Protocols	0.50	12.0				
INT 35110	Robo Wrkcell Integrte Interfac	1.00	24.0				
INT 35120	Machine Center Integration	1.00	24.0				
INT 40010	Production Product Handling	0.58	14.0				

*\*Module cannot be paid for using certain types of financial aid. Please direct all inquiries to the staff at the RMTC registration desk.*

## Program Information

# INSTRUMENTATION

Students enrolled in the Instrumentation program at the RMTC will learn process control, measurement instrumentation, pressure measurement, force weight and motion in instrumentation, flow measurement, level measurement, temperature measurement, analytical measurement and final control elements.

**Matthew Cronkhite** *Instructor*

269-565-7854

[cronkhitem@kellogg.edu](mailto:cronkhitem@kellogg.edu)

**NOTE:** Program information subject to change without notice. Call to verify current information 269-965-4137.

SUBJECT/COURSE#	TITLE	CREDIT HOURS	CONTACT HOURS
INST C910	<b>Instrumentation Orientation</b>		2.0
INST 05010	<b>Process Variab Operat Signl</b>	0.50	12.0
INST 05020	<b>Instrument Identification</b>	0.17	4.0
INST 05030	<b>Sequence of Operation</b>	0.17	4.0
INST 05040	<b>Industrial Requirements</b>	0.17	4.0
INST 05050	<b>System Familiarization 1</b>	0.50	12.0
INST 10010	<b>Process Measurement</b>	0.25	6.0
INST 10020	<b>Transducer Operat Basic Measu</b>	0.33	8.0
INST 10030	<b>Calibration Quality Control</b>	0.33	8.0
INST 10040	<b>System Familiarization 2</b>	1.00	24.0
INST 15010	<b>Pressures in Liquids and Gases</b>	0.25	6.0
INST 15020	<b>Pressure Sensors and Transduce</b>	0.33	8.0
INST 15030	<b>Low Pressure Measurement</b>	0.25	6.0
INST 15040	<b>Installation and Service</b>	0.25	6.0
INST 15050	<b>Pressure Lab</b>	1.50	36.0
INST 20010	<b>Force Stress and Strain</b>	0.33	8.0
INST 20020	<b>Weight and Mass Measurement</b>	0.33	8.0
INST 20030	<b>Materials in Motion</b>	0.17	4.0
INST 20040	<b>Positioning Measurement</b>	0.25	6.0
INST 20050	<b>Acceleration Vibration Shock</b>	0.25	6.0
INST 25010	<b>Introduction to Fluid Flow</b>	0.17	4.0
INST 25020	<b>Measuring Devices PRI and SEC</b>	0.25	6.0
INST 25030	<b>Variable Area Instruments</b>	0.17	4.0
INST 25040	<b>Open Channel Flow Pos Displace</b>	0.33	8.0
INST 25050	<b>Turbine and Magnetic Flowmeter</b>	0.25	6.0
INST 25060	<b>Flowmeters Solids Calibration</b>	0.33	8.0
INST 25070	<b>Flow Lab</b>	1.50	36.0
INST 30010	<b>Level Measurement</b>	0.17	4.0
INST 30020	<b>Electric Pressure Head Instrum</b>	0.33	8.0
INST 30030	<b>Solid Level Measurement</b>	0.33	8.0
INST 30040	<b>Other Leveling Measurements</b>	0.17	4.0
INST 30050	<b>Level Lab</b>	1.50	36.0
INST 35010	<b>Principles and Indicators</b>	0.17	4.0
INST 35020	<b>Elec Bimetal Fluid Instruments</b>	0.50	12.0
INST 35030	<b>Pyrometry</b>	0.25	6.0
INST 35040	<b>Calibration and Setup</b>	0.25	6.0
INST 35050	<b>Temperature Lab</b>	2.00	48.0
INST 40010	<b>Measuring Conductivity pH ORP</b>	0.25	6.0
INST 40020	<b>Optical Measure and Combustion</b>	0.17	4.0
INST 40030	<b>Chromatography</b>	0.17	4.0
INST 45010	<b>Final Control Elements</b>	0.17	4.0
INST 45020	<b>Elec Pneum Hydraulic Actuators</b>	0.50	12.0
INST 45030	<b>Control Valves</b>	0.25	6.0
INST 45040	<b>Control Element Application</b>	0.25	6.0
INST 45050	<b>Control Valve Lab</b>	1.00	24.0

## Program Information

# INDUSTRIAL MACHINING TECHNOLOGY

### Offered at the Regional Manufacturing Technology Center

For complete information  
visit [kellogg.edu/industrial](http://kellogg.edu/industrial)

Associate in Applied Science:  
**60 Credits**  
Certificate: **30 Credits**

Students enrolled in an Industrial Machining Technology program will learn machine tool safety, precision measurement, drill press and band saw operation, lathe turning, electronic discharge machine operation, vertical and horizontal milling, grinding, CNC programming, and CAM.

**JASON MOORE** *Professor*  
269-565-2852  
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**BRANDON MCALLISTER**  
*Instructional Assistant, Industrial Trades,  
Machining and Welding*  
269-565-7873  
[mcallisterb@kellogg.edu](mailto:mcallisterb@kellogg.edu)

**NOTE: Program information subject to  
change without notice. Call to verify  
current information 269-965-4137.**

SUBJECT/COURSE#	TITLE	CREDIT HOURS	CONTACT HOURS
INMT C910	<b>Machining Tech Orientation</b>		2.0
INMT 05010	<b>Machinery's Handbook</b>	0.17	4.0
INMT 10010	<b>Machine Tool Safety</b>	0.17	4.0
INMT 15010	<b>Machine Tool Blueprint Read</b>	0.83	20.0
INMT 15020	<b>Geometric Dimension Tolerance</b>	0.33	8.0
INMT 20010	<b>Basic Shop Math</b>	0.67	16.0
INMT 20020	<b>Machine Tool Math</b>	0.75	18.0
INMT 20030	<b>Machinist Scale</b>	0.08	2.0
INMT 20040	<b>Dividers</b>	0.08	2.0
INMT 20050	<b>Spring Calipers</b>	0.08	2.0
INMT 20060	<b>Combination Square</b>	0.08	2.0
INMT 20070	<b>Hermaphrodite Calipers</b>	0.08	2.0
INMT 20080	<b>Surface Gage</b>	0.08	2.0
INMT 20090	<b>Identify Surface Finishes</b>	0.08	2.0
INMT 25010	<b>Micrometer</b>	0.13	3.0
INMT 25020	<b>Caliper Digital Vern Dial</b>	0.17	4.0
INMT 25030	<b>Telescoping Gages</b>	0.13	3.0
INMT 25040	<b>Depth Micrometer</b>	0.13	3.0
INMT 25050	<b>Dial Indicators</b>	0.13	3.0
INMT 25060	<b>Gage Blocks</b>	0.13	3.0
INMT 25070	<b>Machine Shop Trigonometry</b>	0.67	16.0
INMT 25080	<b>Height Gage</b>	0.17	4.0
INMT 25090	<b>Sine Bar</b>	0.17	4.0
INMT 25100	<b>CMM Fundamentals</b>	0.25	6.0
INMT 25110	<b>CMM Part Inspection</b>	0.67	16.0
INMT 30010	<b>Shop Math Speeds and Feeds</b>	0.21	5.0
INMT 30020	<b>Sharpening Drill Bits</b>	0.25	6.0
INMT 30030	<b>Drilling on the Drill Press</b>	0.17	4.0
INMT 30040	<b>Reaming on the Drill Press</b>	0.13	3.0
INMT 30050	<b>Counterbore Spotface Countersi</b>	0.21	5.0
INMT 30060	<b>Hand Tap on the Drill Press</b>	0.21	5.0
INMT 30070	<b>Power Tap on the Drill Press</b>	0.25	6.0
INMT 30080	<b>Drill Press Project</b>	0.58	14.0
INMT 30090	<b>Band Saw Blade Welding</b>	0.25	6.0
INMT 30100	<b>Vertical Band Saw Project</b>	0.25	6.0

SUBJECT/COURSE#	TITLE	CREDIT HOURS	CONTACT HOURS	SUBJECT/COURSE#	TITLE	CREDIT HOURS	CONTACT HOURS
INMT 35010	<b>Maintaining the Lathe</b>	0.17	4.0	INMT 55010	<b>Parallel Grind to Print</b>	1.00	24.0
INMT 35020	<b>Grinding Lathe Tools</b>	0.25	6.0	INMT 55020	<b>External and Internal Tapers</b>	0.50	12.0
INMT 35030	<b>Facing on the Lathe</b>	0.21	5.0	INMT 65010	<b>CNC Fundamentals</b>	0.83	20.0
INMT 35040	<b>Aligning Lathe Centers</b>	0.17	4.0	INMT 65020	<b>CNC Turning</b>	1.67	40.0
INMT 35050	<b>Parallel Turning on the Lathe</b>	0.21	5.0	INMT 65030	<b>CNC Milling</b>	1.67	40.0
INMT 35060	<b>Groove and Part on the Lathe</b>	0.13	3.0	INMT 65040	<b>CNC Advanced Programming</b>	2.08	50.0
INMT 35070	<b>Cut Radii and External Tapers</b>	0.50	12.0	INMT 70010	<b>Sine Bar</b>	0.83	20.0
INMT 35080	<b>Knurling on the Lathe</b>	0.13	3.0	INMT 70020	<b>Precision Vise</b>	2.08	50.0
INMT 35090	<b>Boring Internal Tapers</b>	0.67	16.0	INMT 70030	<b>1-2-3 Blocks</b>	1.00	24.0
INMT 35100	<b>Cutting External Threads</b>	0.50	12.0	INMT 70040	<b>Tool Makers V-Blocks</b>	1.67	40.0
INMT 35110	<b>Cutting Internal Threads</b>	0.42	10.0	INMT 75010	<b>Mastercam Level 1 Mill</b>	1.50	36.0
INMT 35120	<b>Lathe Project</b>	1.25	30.0	INMT 75020	<b>Mastercam Level 3 Mill</b>	2.00	48.0
INMT 40010	<b>EDM Fundamentals</b>	0.29	7.0	INMT 75030	<b>Mastercam Lathe Design</b>	1.00	24.0
INMT 40020	<b>EDM Project</b>	0.50	12.0	*INMT C710	<b>Basic Machining Project</b>		2.0
INMT 45010	<b>Dial in Vise Tram in Head</b>	0.21	5.0	*INMT C720	<b>Intermediate Machining Project</b>		4.0
INMT 45020	<b>Fly Cutter End Mill Sq Block</b>	0.21	5.0	*INMT C730	<b>Advanced Machining Project</b>		6.0
INMT 45030	<b>Tilt Head Turn Vise Cut V</b>	0.50	12.0				
INMT 45040	<b>Digital Read Drill Tap Ream</b>	0.25	6.0				
INMT 45050	<b>Turntable Cut Radii</b>	0.33	8.0				
INMT 45060	<b>Horizontal Milling Saw Slot</b>	0.17	4.0				
INMT 45070	<b>Sine Plate Cut Angles</b>	0.33	8.0				
INMT 45080	<b>Boring Head Bore 4 Holes</b>	0.33	8.0				
INMT 45090	<b>Indexing Head to Cut Keyways</b>	0.17	4.0				
INMT 45100	<b>Math for Dividing Head</b>	0.17	4.0				
INMT 45110	<b>Dividing Head to Cut Gears</b>	0.42	10.0				
INMT 45120	<b>Universal Indexing Head</b>	0.50	12.0				
INMT 45130	<b>5C Collet to Cut Square Hex</b>	0.33	8.0				
INMT 45140	<b>Make Dove Tails</b>	0.67	16.0				
INMT 45150	<b>Mill Project</b>	1.25	30.0				
INMT 50010	<b>Square a Block (6 Sides)</b>	0.25	6.0				
INMT 50020	<b>Grind Angles and Radii</b>	0.50	12.0				
INMT 50030	<b>Operate The Automatic Grinder</b>	0.42	10.0				
INMT 50040	<b>Complete Two Projects to Print</b>	1.58	38.0				

*\*Module(s) cannot be paid for using certain types of financial aid. Please direct all inquiries to the staff at the RMTC registration desk.*

## Program Information

# INDUSTRIAL TOOL AND DIE

### Offered at the Regional Manufacturing Technology Center

For complete information  
visit [kellogg.edu/industrial](http://kellogg.edu/industrial)

The Industrial Tool and Die curriculum is specifically designed for company sponsored students who are currently working as machinists or toolmakers. The Tool and Die instructor will work with the company representative to select modules within the Tool and Die curriculum which will best serve the student's individual needs.

**JASON MOORE** *Professor*

269-565-2852

[moorej@kellogg.edu](mailto:moorej@kellogg.edu)

SUBJECT/COURSE#	TITLE	CREDIT HOURS	CONTACT HOURS
INTD C910	<b>Tool and Die Orientation</b>		2.0
INTD 10010	<b>Heat Treating 1</b>	1.00	24.0
INTD 10020	<b>Heat Treating 2</b>	2.00	48.0
INTD 15010	<b>Jig &amp; Fixture Design 1</b>	1.00	24.0
INTD 15020	<b>Jig &amp; Fixture Design 2</b>	2.00	48.0
INTD 15030	<b>Jig &amp; Fixture Design 3</b>	3.00	72.0
INTD 20010	<b>Gage Design 1</b>	1.00	24.0
INTD 20020	<b>Gage Design 2</b>	2.00	48.0
INTD 20030	<b>Gage Design 3</b>	3.00	72.0
INTD 25010	<b>Die Design 1</b>	1.00	24.0
INTD 25020	<b>Die Design 2</b>	2.00	48.0
INTD 25030	<b>Die Design 3</b>	3.00	72.0
INTD 30010	<b>Jig &amp; Fixture Making 1</b>	1.00	24.0
INTD 30020	<b>Jig &amp; Fixture Making 2</b>	2.00	48.0
INTD 30030	<b>Jig &amp; Fixture Making 3</b>	3.00	72.0
INTD 35010	<b>Gage Making 1</b>	1.00	24.0
INTD 35020	<b>Gage Making 2</b>	2.00	48.0
INTD 35030	<b>Gage Making 3</b>	3.00	72.0
INTD 40010	<b>Die Making 1</b>	1.00	24.0
INTD 40020	<b>Die Making 2</b>	2.00	48.0
INTD 40030	<b>Die Making 3</b>	3.00	72.0
INTD 45010	<b>Mold Design 1</b>	1.00	24.0
INTD 45020	<b>Mold Design 2</b>	2.00	48.0
INTD 45030	<b>Mold Design 3</b>	3.00	72.0
INTD 50010	<b>Mold Making 1</b>	1.00	24.0
INTD 50020	<b>Mold Making 2</b>	2.00	48.0
INTD 50030	<b>Mold Making 3</b>	3.00	72.0

**NOTE: Program information subject to change without notice. Call to verify current information 269-965-4137.**

## Program Information

# INDUSTRIAL PIPEFITTING

### Offered at the Regional Manufacturing Technology Center

For complete information  
visit [kellogg.edu/industrial](http://kellogg.edu/industrial)

Associate in Applied Science:  
**60 Credits**  
Certificate: **25 Credits**

Students enrolled in a Industrial Pipefitting program at the RMTc will learn pipefitting safety, pipefitting science, blueprint reading, mathematics for pipefitting, pipefitting, plumbing, fire protection, thermodynamics of heat, expansion, pumps, flow control, compressed air, steam, boilers, and piping maintenance.

**ANDREW REDLON** *Professor*  
269-565-2813  
[redlona@kellogg.edu](mailto:redlona@kellogg.edu)

**NOTE: Program information subject to change without notice. Call to verify current information 269-965-4137.**

SUBJECT/COURSE#	TITLE	CREDIT HOURS	CONTACT HOURS
INPF C910	Pipefitting Orientation		2.0
INPF 05011	Pipefitting Safety	1.00	24.0
INPF 10011	Pipefitting Science	0.25	6.0
INPF 15011	Intro to Blueprint Reading	0.33	8.0
INPF 15021	Identifying Piping Symbols	0.25	6.0
INPF 15031	Read Interpret Piping Blueprint	0.25	6.0
INPF 15041	Troubleshooting Blueprints	0.08	2.0
INPF 20011	Pipefitting Tools Materials	0.25	6.0
INPF 20021	Types of Piping	0.42	10.0
INPF 20031	Specialty Piping	0.33	8.0
INPF 20041	Pipe Fittings & Pressure Loss	0.25	6.0
INPF 20051	Piping Connections	0.33	8.0
INPF 20061	Pipe Cutting and Threads	0.17	4.0
INPF 20071	Piping Flanges	0.42	10.0
INPF 20081	Piping Stainless	0.33	8.0
INPF 25012	Pipefitting Math 1	0.17	4.0
INPF 25022	Pipefitting Math 2	0.25	6.0
INPF 25032	Pipefitting Math 3	0.63	15.0
INPF 25042	Pipefitting Math 4	0.25	6.0
INPF 25052	Pipefitting Math 5	0.25	6.0
INPF 25062	Pipefitting Math 6	0.83	20.0
INPF 25072	Pipefitting Math 7	0.25	6.0
INPF 30011	Basic Ratio Pipe Capacities	0.25	6.0
INPF 30021	Valves Manual	0.42	10.0
INPF 30031	Valves Self Contained	0.29	7.0
INPF 30041	Piping Support	0.25	6.0
INPF 30051	PVC Piping	0.29	7.0
INPF 30061	Piping Compression	0.25	6.0
INPF 30071	Soldering and Brazing	0.63	15.0
INPF 30081	Tube Bending	0.29	7.0
INPF 30091	Pressure Tap & Tracing	0.42	10.0
INPF 30101	Victaulic	0.33	8.0
INPF 30111	Fiberglass Reinforced Pipe	0.08	2.0
INPF 30121	Greenthread	0.08	2.0
INPF 30131	CPVC Piping	0.08	2.0
INPF 35011	Purpose of the Plumbing Code	0.17	4.0
INPF 35021	Fixtures & Appliances	0.17	4.0
INPF 35031	Potable Water Protection	0.42	10.0

SUBJECT/COURSE#	TITLE	CREDIT HOURS	CONTACT HOURS	SUBJECT/COURSE#	TITLE	CREDIT HOURS	CONTACT HOURS
INPF 35041	<b>Sewage Systems</b>	0.21	5.0	INPF 60081	<b>Pneumatic Controls</b>	0.67	16.0
INPF 35051	<b>Drains</b>	0.21	5.0	INPF 60091	<b>Flow Measurement</b>	0.29	7.0
INPF 35061	<b>Traps Interceptors Backwater</b>	0.42	10.0	INPF 65011	<b>Types of Air Compressors</b>	0.13	3.0
INPF 35071	<b>Stacks &amp; Rough-in Sheets</b>	0.17	4.0	INPF 65021	<b>Supporting Components</b>	0.25	6.0
INPF 35081	<b>Purpose of ASME Code</b>	0.08	2.0	INPF 70011	<b>Steam Safety</b>	0.13	3.0
INPF 35091	<b>Using the ASME Code</b>	0.17	4.0	INPF 70021	<b>Fundamentals of Steam</b>	0.25	6.0
INPF 35101	<b>Importance of Safeties</b>	0.08	2.0	INPF 70031	<b>Steam Traps</b>	0.67	16.0
INPF 35111	<b>Pressure Test and Leak Test</b>	0.29	7.0	INPF 70041	<b>Water Hammer</b>	0.08	2.0
INPF 35121	<b>Venting Drainage Systems</b>	0.21	5.0	INPF 70051	<b>Steam Coils and Radiators</b>	0.33	8.0
INPF 35122	<b>Gas Systems Piping</b>	0.13	3.0	INPF 70061	<b>Vacuum Breakers</b>	0.17	4.0
INPF 35131	<b>Installing Water Heaters</b>	0.17	4.0	INPF 70071	<b>Steam Heat Exchangers</b>	0.42	10.0
INPF 40011	<b>NFPA 13 Code Book</b>	0.29	7.0	INPF 75011	<b>Fundamentals of Boilers</b>	0.17	4.0
INPF 40021	<b>Sprinkler Heads</b>	0.21	5.0	INPF 75021	<b>Hot Water Boilers</b>	0.42	10.0
INPF 40031	<b>Wet Fire Protection System</b>	0.21	5.0	INPF 75031	<b>Air Traps</b>	0.08	2.0
INPF 40041	<b>Dry Fire Protection System</b>	0.21	5.0	INPF 75041	<b>Low Pressure Boilers</b>	0.29	7.0
INPF 40051	<b>Deluge &amp; Foam Fire Protection</b>	0.21	5.0	INPF 75051	<b>High Pressure Boilers</b>	0.54	13.0
INPF 45011	<b>Force and Motion</b>	0.08	2.0	INPF 75061	<b>Boiler Controls</b>	0.25	6.0
INPF 45021	<b>Laws of Motion</b>	0.08	2.0	INPF 75071	<b>Boiler Safeties</b>	0.08	2.0
INPF 45031	<b>Conservation of Momentum</b>	0.08	2.0	INPF 75081	<b>Boiler Valves</b>	0.17	4.0
INPF 45041	<b>Gravity</b>	0.08	2.0	INPF 75091	<b>Boiler Blowdown</b>	0.08	2.0
INPF 45051	<b>Atoms and Molecules</b>	0.08	2.0	INPF 75101	<b>Condensate Return</b>	0.50	12.0
INPF 45061	<b>Solids</b>	0.08	2.0	INPF 75111	<b>Boiler Feed Water</b>	0.25	6.0
INPF 45071	<b>Liquids and Gases</b>	0.08	2.0	INPF 75121	<b>Troubleshooting Boilers</b>	0.25	6.0
INPF 45081	<b>Temperature and Heat</b>	0.08	2.0	INPF 75131	<b>Boiler Preventative Maint Ins</b>	0.25	6.0
INPF 45091	<b>Change of State</b>	0.08	2.0	INPF 80011	<b>Piping Maintenance</b>	0.50	12.0
INPF 50011	<b>Expansion Joints</b>	0.08	2.0				
INPF 55011	<b>Centrifugal Pumps</b>	0.42	10.0				
INPF 55021	<b>Positive Displacement Pumps</b>	0.42	10.0				
INPF 60011	<b>Control Theory 1</b>	0.33	8.0				
INPF 60021	<b>Control Theory 2</b>	0.13	3.0				
INPF 60031	<b>Control Theory 3</b>	0.33	8.0				
INPF 60041	<b>Control Valves</b>	0.25	6.0				
INPF 60051	<b>Regulators</b>	0.25	6.0				
INPF 60061	<b>Pressure Reducing Valves</b>	0.67	16.0				
INPF 60071	<b>Electromechanical Controls</b>	0.25	6.0				



## Program Information

# RENEWABLE ENERGY

### Offered at the Regional Manufacturing Technology Center

For complete information  
visit [kellogg.edu/industrial](http://kellogg.edu/industrial)

Certificate: **25 Credits**

Students enrolled in a Renewable Energy program will learn renewable energy and energy conservation, photovoltaic (PV) theory, PV system components, PV system installation, wind energy theory, wind system components, and wind system installation.

*Note: the course list shown are the Electricity/Electronics and Renewable Energy courses needed to complete the Renewable Energy Certificate.*

**TIM KRUEGER** Professor  
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**NOTE: Program information subject to change without notice. Call to verify current information 269-965-4137.**

SUBJECT/COURSE#	TITLE	CREDIT HOURS	CONTACT HOURS
INRE C910	Renewable Energy Orientation		2.0
INEL C910	Electric Electronics Orientation		2.0
INEL 05010	Electrical Safety	0.17	4.0
INEL 10020	Electrical Math 2	0.25	6.0
INEL 10030	Electrical Math 3	0.25	6.0
INEL 15010	Electrical Theory	0.25	6.0
INEL 15020	Static Electricity	0.25	6.0
INEL 15030	Calculators and Electronics	0.25	6.0
INEL 15040	Devices and Symbols	0.25	6.0
INEL 15050	Multimeter	0.33	8.0
INEL 15060	Ohm's Law	0.33	8.0
INEL 15070	Series Circuits	0.33	8.0
INEL 15080	Parallel Circuits	0.33	8.0
INEL 15090	Combination Circuits	0.33	8.0
INEL 15100	Magnetism	0.25	6.0
INEL 15110	Alternating Current	0.25	6.0
INEL 15120	Oscilloscope	0.33	8.0
INEL 15130	Inductance	0.42	10.0
INEL 15140	Capacitance	0.42	10.0
INEL 15150	RLC Circuits	0.33	8.0
INEL 15160	Conduction	0.33	8.0
INEL 15170	Theory Overview	0.21	5.0
INEL 35010	General Wiring Fundamentals	0.25	6.0
INEL 35020	Wire Raceway and Box Sizing	0.33	8.0
INEL 35030	Branch Circuits	0.33	8.0
INEL 35040	Service Feeder Calculations	0.25	6.0
INEL 35050	Grounding and Bonding	0.33	8.0
INEL 35060	Overcurrent Protection	0.33	8.0
INEL 35130	Special Application Wiring	0.25	6.0
INEL 40010	Power Generation Distribution	0.33	8.0
INEL 40020	Electrical Wiring Techniques	0.33	8.0
INEL 40030	Wiring System Installation	0.42	10.0
INEL 40040	Introduction to Raceways	0.42	10.0
INEL 40050	Basic Conduit Bending	0.25	6.0
INEL 40060	Advanced Raceways	0.25	6.0
INEL 40070	Conductor Overcurrent Protect	0.25	6.0

<b>SUBJECT/COURSE#</b>	<b>TITLE</b>	<b>CREDIT HOURS</b>	<b>CONTACT HOURS</b>
INEL 40080	<b>Conduit Sizing Wire Pulling</b>	0.33	8.0
INRE 05010	<b>Modern Energy Sources</b>	0.25	6.0
INRE 05020	<b>Personal Energy Use</b>	0.67	16.0
INRE 05030	<b>Industrial Energy Use</b>	0.50	12.0
INRE 05040	<b>Traditional Energy Sources</b>	0.33	8.0
INRE 05050	<b>Exotic Energy Production</b>	0.33	8.0
INRE 10010	<b>Intro to Photovoltaic Systems</b>	0.50	12.0
INRE 10020	<b>Solar Radiation</b>	0.50	12.0
INRE 15010	<b>Cells Modules and Arrays</b>	0.88	21.0
INRE 15020	<b>Inverters</b>	0.25	6.0
INRE 15030	<b>Batteries Charge Controllers</b>	0.33	8.0
INRE 15040	<b>Balance of System</b>	0.25	6.0
INRE 15050	<b>System Types</b>	0.67	16.0
INRE 20010	<b>Photovoltaic Safety</b>	0.21	5.0
INRE 20020	<b>Electrical NEC Requirements</b>	0.75	18.0
INRE 20030	<b>Site Evaluation and Sizing</b>	0.67	16.0
INRE 20040	<b>Construct Commissioning Troubl</b>	0.75	18.0
INRE 20050	<b>Photovoltaic System Project</b>	1.00	24.0
INRE 25010	<b>Wind System Introduction</b>	0.33	8.0
INRE 25020	<b>History of Wind</b>	0.42	10.0
INRE 25030	<b>Meteorology and Geography</b>	0.33	8.0
INRE 25040	<b>Mechanics of the Wind</b>	0.33	8.0
INRE 30010	<b>Turbine Technology</b>	0.67	16.0
INRE 30020	<b>DC Generation Principles</b>	0.58	14.0
INRE 30030	<b>AC Generation Principles</b>	0.42	10.0
INRE 30040	<b>Towers</b>	0.25	6.0
INRE 35010	<b>Wind Safety</b>	0.33	8.0
INRE 35020	<b>Wind Application</b>	0.33	8.0
INRE 35030	<b>Buying a Wind System</b>	0.50	12.0
INRE 35040	<b>Siting</b>	0.58	14.0
INRE 35050	<b>System Installation</b>	0.67	16.0
INRE 35060	<b>System Operation</b>	0.33	8.0

## Program Information

# INDUSTRIAL WELDING

### Offered at the Regional Manufacturing Technology Center

For complete information  
visit [kellogg.edu/industrial](http://kellogg.edu/industrial)

Associate in Applied Science:

**60 Credits**

Certificate: **25 Credits**

Students enrolled in a Industrial Welding program at the RMTTC will learn about gases used in welding, cutting processes, brazing and soldering, joints, shielded metal arc welding, advanced arc welding, welding metallurgy, gas metal arc welding, gas tungsten arc welding, and pipe welding.

**STEVE CASSELMAN** *Professor*

269-565-2832

[casselmans@kellogg.edu](mailto:casselmans@kellogg.edu)

**BRANDON MCALLISTER**

*Instructional Assistant, Industrial Trades,  
Machining and Welding*

269-565-7873

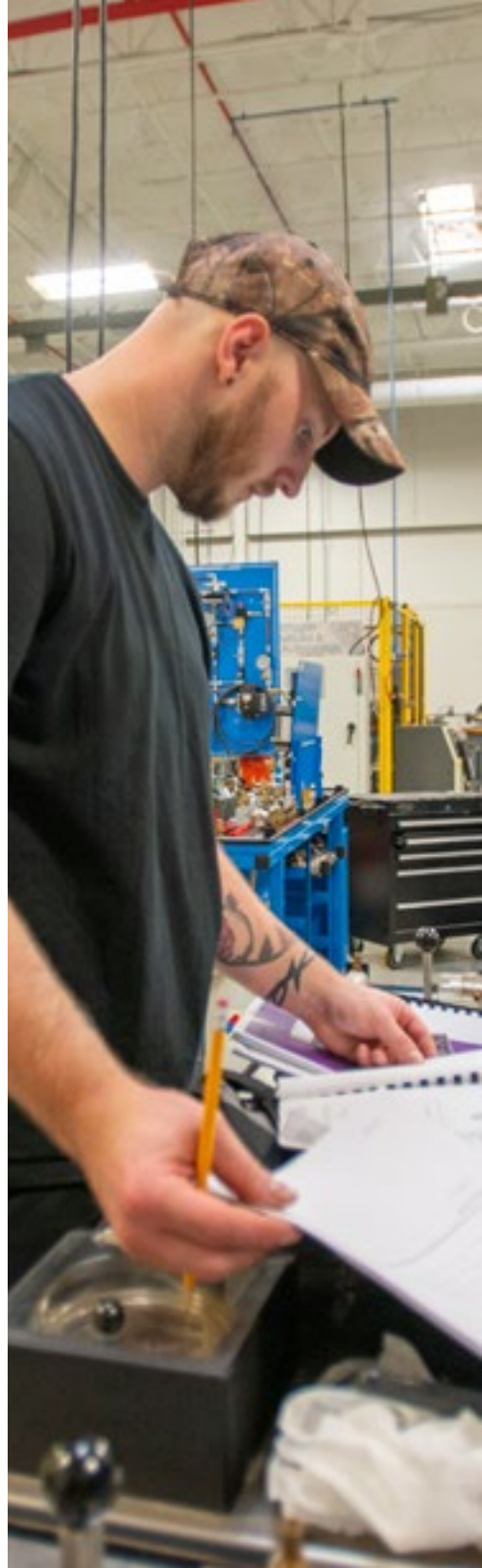
[mcallisterb@kellogg.edu](mailto:mcallisterb@kellogg.edu)

**NOTE: Program information subject to  
change without notice. Call to verify  
current information 269-965-4137.**

SUBJECT/COURSE#	TITLE	CREDIT HOURS	CONTACT HOURS
INWE C910	<b>Welding Orientation</b>		2.0
INWE 05010	<b>Welding Shop Safety Rules</b>	0.17	4.0
INWE 05020	<b>Joints Welds Positions</b>	0.13	3.0
INWE 05030	<b>Rules and Squares</b>	0.13	3.0
INWE 10010	<b>Oxy-Fuel Welding Terms</b>	0.17	4.0
INWE 10020	<b>Set Up Oxy-Fuel Weld Stat</b>	0.08	2.0
INWE 10030	<b>Run Beads w/wo Fill</b>	0.29	7.0
INWE 10040	<b>Weld Joints Flat Position</b>	1.00	24.0
INWE 15010	<b>Basic Cutting Practices</b>	0.13	3.0
INWE 15020	<b>Cut Ferrous Met w Oxy Fuel</b>	0.33	8.0
INWE 15030	<b>Cutting Metals w Plasma</b>	0.33	8.0
INWE 20010	<b>Braz Joints Flat Position</b>	0.33	8.0
INWE 20020	<b>Braz V-Groove Joints</b>	0.21	5.0
INWE 20030	<b>Silver Braz Dissimilar Metals</b>	0.13	3.0
INWE 20040	<b>Lead Soldering Seams</b>	0.25	6.0
INWE 25010	<b>SMAW Terms Definitions</b>	0.17	4.0
INWE 25020	<b>Electrodes for SMAW</b>	0.21	5.0
INWE 25030	<b>Strike Arc Run Beads</b>	0.67	16.0
INWE 25040	<b>Analyze Weld Characteristics</b>	0.13	3.0
INWE 25050	<b>Multipass Fillet Welds</b>	0.50	12.0
INWE 25060	<b>Weld Size Weave Technique</b>	0.50	12.0
INWE 25070	<b>Corner Joint Flat Position</b>	0.67	16.0
INWE 25080	<b>V-Groove Butt W Backing</b>	0.50	12.0
INWE 25090	<b>V-Groove Butt wo Backing</b>	0.67	16.0
INWE 30010	<b>Tee Joints Vertical Up</b>	0.58	14.0
INWE 30020	<b>Butt w Back Vertical Up</b>	0.46	11.0
INWE 30030	<b>Butt wo Back Vertical Up</b>	0.75	18.0
INWE 30040	<b>Tee Joints Vertical Down</b>	0.29	7.0
INWE 30050	<b>Butt w Back Vertical Down</b>	0.42	10.0
INWE 30060	<b>Butt Wo Back Vertical Down</b>	0.33	8.0
INWE 30070	<b>Butt w Back Horizontal</b>	0.50	12.0
INWE 30080	<b>Butt wo Back Horizontal</b>	0.50	12.0
INWE 30090	<b>Tee Joints Overhead</b>	0.50	12.0
INWE 30100	<b>Butt w Back Overhead</b>	0.58	14.0
INWE 30110	<b>Butt wo Back Overhead</b>	0.83	20.0
*INWE C410	<b>SMAW Certification</b>		6.0
INWE 35010	<b>Intro to Metallurgy</b>	0.46	11.0
INWE 35020	<b>Examine Identify Metals</b>	0.13	3.0
INWE 35030	<b>Metallurgy Fund Cast Iron</b>	0.13	3.0

SUBJECT/COURSE#	TITLE	CREDIT HOURS	CONTACT HOURS
INWE 35040	<b>Metallurgy Fund Stainless</b>	0.13	3.0
INWE 35050	<b>Testing Metals</b>	0.42	10.0
INWE 40010	<b>Explaining GMAW</b>	0.29	7.0
INWE 40020	<b>Start Arc Run Beads GMAW</b>	0.17	4.0
INWE 40030	<b>GMAW FCAW Weld All Positions</b>	1.67	40.0
INWE 40040	<b>GMAW of Aluminum</b>	0.67	16.0
*INWE C420	<b>GMAW Certification</b>		6.0
INWE 45010	<b>Explaining GTAW</b>	0.42	10.0
INWE 45020	<b>Start Arc Run Beads GTAW</b>	0.42	10.0
INWE 45030	<b>GTAW Aluminum Flat Position</b>	1.25	30.0
INWE 45040	<b>Basic Joints Stainless</b>	1.25	30.0
INWE 45050	<b>GTAW Aluminum Out Position</b>	1.67	40.0
*INWE C430	<b>GTAW Certification</b>		8.0
INWE 50010	<b>Identifying Pipe Welding</b>	0.21	5.0
INWE 50020	<b>2G Fixed Position</b>	0.83	20.0
INWE 50030	<b>5G Fixed Vertical Up</b>	1.25	30.0
INWE 50040	<b>5G Fixed Vertical Down</b>	1.04	25.0
INWE 50050	<b>6G Fixed Position</b>	1.04	25.0
*INWE C440	<b>Pipe Welding Certification</b>		12.0
INWE 55010	<b>Welding Blueprint Reading</b>	0.17	4.0
INWE 55020	<b>Fabricating a Project</b>	0.50	12.0
INWE 55030	<b>Cast Iron Repair</b>	0.17	4.0
INWE 55040	<b>Hardsurfacing</b>	0.17	4.0
INWE 55050	<b>Tool and Die Welding</b>	0.67	16.0
*INWE C710	<b>Basic Welding Project</b>		2.0
*INWE C720	<b>Intermediate Welding Project</b>		4.0
*INWE C730	<b>Advanced Welding Project</b>		6.0

*\*Module(s) cannot be paid for using certain types of financial aid. Please direct all inquiries to the staff at the RMTC registration desk.*



## Program Information

# MAINTENANCE TECHNICIAN CERTIFICATE

### Offered at the Regional Manufacturing Technology Center

For complete information  
visit [kellogg.edu/industrial](http://kellogg.edu/industrial)

Certificate: **16 Credits**

**Matthew Cronkhite**  
Faculty, Industrial Technology  
269-565-7854  
[cronkhitem@kellogg.edu](mailto:cronkhitem@kellogg.edu)

**NOTE: Program information subject to  
change without notice. Call to verify  
current information 269-965-4137.**

SUBJECT/COURSE#	TITLE	CREDIT HOURS	CONTACT HOURS
INT C910	Ind Technology Orientation		2
<b>REQUIRED COURSES:</b>			
INT 15010	Fundamentals of Print Reading	0.92	22
INT 15020	Machine Prints	0.17	4
INT 30010	Manufacturing Safety	1.00	24
INT 30020	OSHA 10	0.92	22
NT 30040	Arc Flash Lockout Tagout	0.29	7
INT 30060	Intro to Power Transmissions	0.13	3
INT 30070	Couplings	0.17	4
INT 30080	Clutches and Brakes	0.33	8
INT 30100	V Belt Drives	0.25	6
INT 30110	Chain Drives	0.25	6
INT 30120	Speed Reducers	0.25	6
INT 30140	Lubricants and Lubrication	0.17	4
INT 30160	Oils and their Applications	0.08	2
INT 30230	Bearing Installation Removal	0.50	12
INT 30320	Hand and Power Tools	0.67	16
INT 40020	Ind Maintenance Troubleshootin	0.92	22
INT 40030	Preventive Predictive Mainten	1.25	30
INT 40120	Facts About Air	0.33	8
*INT C450	MSSC Maintenance Assessment		1.5

**Total for required courses = 8.72 CREDITS**

### ELECTIVES REQUIRED

Additional Industrial Trades electives in: INEL, INHR, INMT, INPF, INRE, INST, INTD, INWE and INT minus the required INT courses and/or iACT Electives = 7.28 credits

**MAINTENANCE TECHNICIAN CERTIFICATE  
PROGRAM TOTAL CREDITS = 16**

*\*Module(s) cannot be paid for using certain types  
of financial aid. Please direct all inquiries to the staff  
at the RMTC registration desk.*

# OTHER LOCATIONS

Various modules from some programs are offered at other locations, including the Branch Area Careers Center (Coldwater), the Eastern Academic Center (Albion), and Hastings High School (Hastings).

For more information, please contact the following:

**BRANCH AREA CAREERS CENTER  
INFORMATION – CONTACT THE RMTc**  
269-965-4137

**EASTERN ACADEMIC CENTER**  
517-630-8169

**HASTINGS HIGH SCHOOL  
INFORMATION - CONTACT THE RMTc**  
269-965-4137

# ARTICULATION

Earn College credit towards a certificate or degree in industrial trades while you are still in high school through your local career center. For more information, call 269-965-4137.

**CALHOUN AREA CAREER CENTER**  
475 E. Roosevelt Avenue  
Battle Creek, MI 49017  
269-968-2271  
[calhounisd.org/CACC](http://calhounisd.org/CACC)

**BRANCH AREA CAREERS CENTER**  
366 Morse Street  
Coldwater, MI 49036  
517-279-5721  
[branch-isd.org/BACC](http://branch-isd.org/BACC)

Note: articulated credit not awarded until a KCC academic course is successfully completed.

**NOTE: Program information subject to change without notice. Call to verify current information 269-965-4137.**

# Industrial Electricity/ Electronics Courses offered at the Branch Area Careers Center\*

*\*Availability of this program is dependent on enrollment.*

SUBJECT/COURSE#	TITLE	CREDIT HOURS	CONTACT HOURS
INEL C910	<b>Electric Electronics Orientation</b>		2.0
INEL 05010	<b>Electrical Safety</b>	0.17	4.0
INEL 10010	<b>Electrical Math 1</b>	0.08	2.0
INEL 10020	<b>Electrical Math 2</b>	0.25	6.0
INEL 10030	<b>Electrical Math 3</b>	0.25	6.0
INEL 15010	<b>Electrical Theory</b>	0.25	6.0
INEL 15020	<b>Static Electricity</b>	0.25	6.0
INEL 15030	<b>Calculators and Electronics</b>	0.25	6.0
INEL 15040	<b>Devices and Symbols</b>	0.25	6.0
INEL 15050	<b>Multimeter</b>	0.33	8.0
INEL 15060	<b>Ohm's Law</b>	0.33	8.0
INEL 15070	<b>Series Circuits</b>	0.33	8.0
INEL 15080	<b>Parallel Circuits</b>	0.33	8.0
INEL 15090	<b>Combination Circuits</b>	0.33	8.0
INEL 15100	<b>Magnetism</b>	0.25	6.0
INEL 15110	<b>Alternating Current</b>	0.25	6.0
INEL 15120	<b>Oscilloscope</b>	0.33	8.0
INEL 15130	<b>Inductance</b>	0.42	10.0
INEL 15140	<b>Capacitance</b>	0.42	10.0
INEL 15150	<b>RLC Circuits</b>	0.33	8.0
INEL 15160	<b>Conduction</b>	0.33	8.0
INEL 15170	<b>Theory Overview</b>	0.21	5.0
INEL 20010	<b>Electrical Motor Controls</b>	0.42	10.0
INEL 20020	<b>Manual Motor Controls</b>	0.50	12.0
INEL 20030	<b>Control Transformers</b>	0.42	10.0
INEL 20040	<b>Control Ladder Logic</b>	0.67	16.0
INEL 20050	<b>Control Relays Motor Starters</b>	0.50	12.0
INEL 20060	<b>Introduction Troubleshooting</b>	0.33	8.0
INEL 20070	<b>Systems Troubleshooting</b>	0.42	10.0
INEL 20080	<b>Automatic Input Devices</b>	0.42	10.0
INEL 20090	<b>Electronic Sensors</b>	0.33	8.0
INEL 20100	<b>Basic Timer Control</b>	0.33	8.0
INEL 20110	<b>Timers and Counters</b>	0.25	6.0

SUBJECT/COURSE#	TITLE	CREDIT HOURS	CONTACT HOURS	SUBJECT/COURSE#	TITLE	CREDIT HOURS	CONTACT HOURS
INEL 35010	<b>General Wiring Fundamentals</b>	0.25	6.0	INEL 55060	<b>Power Supplies</b>	0.50	12.0
INEL 35020	<b>Wire Raceway and Box Sizing</b>	0.33	8.0	INEL 55070	<b>Photo Devices</b>	0.33	8.0
INEL 35030	<b>Branch Circuits</b>	0.33	8.0	INEL 55080	<b>Solid State Devices</b>	0.83	20.0
INEL 35040	<b>Service Feeder Calculations</b>	0.25	6.0	INEL 55090	<b>Electronic Timing</b>	0.33	8.0
INEL 35050	<b>Grounding and Bonding</b>	0.33	8.0	INEL 55100	<b>Amplifiers</b>	0.83	20.0
INEL 35060	<b>Overcurrent Protection</b>	0.33	8.0	INEL 55110	<b>Digital Logic Fundamentals</b>	0.50	12.0
INEL 35070	<b>Motor Circuit Wiring</b>	0.25	6.0	INEL 55120	<b>Digital Logic Applications</b>	0.42	10.0
INEL 35080	<b>Transformers</b>	0.25	6.0	INEL 55130	<b>Proximity Switching</b>	0.17	4.0
INEL 35090	<b>General Hazardous Locations</b>	0.25	6.0	INEL 55140	<b>Photoelectric Devices</b>	0.17	4.0
INEL 35100	<b>Health Care Facilities</b>	0.25	6.0	INEL 55150	<b>Fiber Optic Fundamentals</b>	0.33	8.0
INEL 35110	<b>Emergency Power Systems</b>	0.33	8.0	INEL 55160	<b>Fiber Optic Lab</b>	0.25	6.0
INEL 35120	<b>Industrial Applications</b>	0.33	8.0				
INEL 35130	<b>Special Application Wiring</b>	0.25	6.0				
INEL 35140	<b>NEC Review</b>	0.17	4.0				
INEL 40010	<b>Power Generation Distribution</b>	0.33	8.0				
INEL 40020	<b>Electrical Wiring Techniques</b>	0.33	8.0				
INEL 40030	<b>Wiring System Installation</b>	0.42	10.0				
INEL 40040	<b>Introduction to Raceways</b>	0.42	10.0				
INEL 40050	<b>Basic Conduit Bending</b>	0.25	6.0				
INEL 40060	<b>Advanced Raceways</b>	0.25	6.0				
INEL 40070	<b>Conductor Overcurrent Protect</b>	0.25	6.0				
INEL 40080	<b>Conduit Sizing Wire Pulling</b>	0.33	8.0				
INEL 45010	<b>Plans and Site Work</b>	0.25	6.0				
INEL 45020	<b>Industrial Power Systems</b>	0.42	10.0				
INEL 45030	<b>Signaling Systems</b>	0.25	6.0				
INEL 45040	<b>Motors Controllers Installation</b>	0.33	8.0				
INEL 45050	<b>Special Equipment &amp; HVAC</b>	0.33	8.0				
INEL 45060	<b>Industrial Hazardous Locations</b>	0.25	6.0				
INEL 45070	<b>Single Phase Transformers</b>	0.33	8.0				
INEL 45080	<b>3 Phase Transformers</b>	0.50	12.0				
INEL 45090	<b>NEC Transformer Requirements</b>	0.25	6.0				
INEL 45100	<b>Emergency Electrical Systems</b>	0.25	6.0				
INEL 55010	<b>Using the Oscilloscope</b>	0.67	16.0				
INEL 55020	<b>Meters for Electronics</b>	0.33	8.0				
INEL 55030	<b>Electronic Soldering</b>	0.25	6.0				
INEL 55040	<b>Soldering Printed Circuit Boar</b>	0.25	6.0				
INEL 55050	<b>Diodes</b>	0.25	6.0				

*Please note: Kellogg Community College offers additional Industrial Electricity/Electronics courses at the Regional Manufacturing Technology Center in Battle Creek and the Eastern Academic Center in Albion.*

# Industrial Technology Courses offered at the Branch Area Careers Center\*

\*Availability of this program is dependent on enrollment.

SUBJECT/COURSE#	TITLE	CREDIT HOURS	CONTACT HOURS
INT C910	Industrial Technology Orientation		2.0
INT 10010	Principles of Ferrous Metals	0.63	15.0
INT 10020	Principles Non Ferrous Metals	0.63	15.0
INT 10060	Statics and Data Acquisition	0.42	10.0
INT 10070	Thermodyn Energy Heat Transfer	1.00	24.0
INT 10080	Dynamics Force and Motion	1.13	27.0
INT 10090	Fluids	0.33	8.0
INT 15030	Electrical Prints	0.29	7.0
INT 15040	Hydraulic Pneumatic Print	0.29	7.0
INT 15050	Welding Prints	0.08	2.0
INT 15060	Piping Plumbing Prints	0.21	5.0
INT 30010	Manufacturing Safety	1.00	24.0
INT 30020	OSHA 10	0.92	22.0
INT 30040	Arc Flash Lockout Tagout	0.29	7.0
INT 30050	Electromechanical Device Equip	1.08	26.0
INT 30060	Intro to Power Transmissions	0.13	3.0
INT 30090	Flat Belt Drives	0.25	6.0
INT 30100	V Belt Drives	0.25	6.0
INT 30110	Chain Drives	0.25	6.0
INT 30140	Lubricants and Lubrication	0.17	4.0
INT 30150	Additives Lub Act Bearing Lub	0.08	2.0
INT 30160	Oils and Their Applications	0.08	2.0
INT 30170	General Special Purpose Grease	0.17	4.0
INT 30190	Lubricating Systems Methods	0.13	3.0
INT 30200	Lubricant Storage and Handling	0.08	2.0
INT 30260	Rigging Safety Weight Estimate	0.13	3.0
INT 30270	Rigging Safety Wire Rope Sling	0.13	3.0
INT 30280	Rig Safety Fiber Rope Slings	0.38	9.0
INT 30290	Rigging Safety Chain Slings	0.08	2.0
INT 30300	Rigging Safety Hoists Cranes	0.21	5.0

SUBJECT/COURSE#	TITLE	CREDIT HOURS	CONTACT HOURS
INT 30310	Rigging Safety Hand Signals	0.13	3.0
INT 30320	Hand and Power Tools	0.67	16.0
INT 40010	Production Product Handling	0.58	14.0
INT 40020	Ind Maintenance Troubleshootin	0.92	22.0
INT 40030	Preventive Predictive Mainten	1.25	30.0
INT 45030	Quality Systems Lean Mfg	0.67	16.0
INT 45040	5S System	0.33	8.0
INT 45050	Tpm Poka Yoke and Lean Theory	0.45	11.0
INT 45060	Lean Visual Workplace Kaizen	0.29	7.0
INT 45070	Value Stream Mapping Setup Red	0.38	9.0

Please note: Kellogg Community College offers additional Industrial Technology courses at the Regional Manufacturing Technology Center in Battle Creek and the Eastern Academic Center in Albion.



# Industrial Machining Technology Courses offered at the Branch Area Careers Center\*

\*Availability of this program is dependent on enrollment.

SUBJECT/COURSE#	TITLE	CREDIT HOURS	CONTACT HOURS	SUBJECT/COURSE#	TITLE	CREDIT HOURS	CONTACT HOURS
INMT C910	<b>Machining Orientation</b>		2.0	INMT 35030	<b>Facing on the Lathe</b>	0.21	5.0
INMT 05010	<b>Machinery's Handbook</b>	0.17	4.0	INMT 35040	<b>Aligning Lathe Centers</b>	0.17	4.0
INMT 10010	<b>Machine Tool Safety</b>	0.17	4.0	INMT 35050	<b>Parallel Turning on the Lathe</b>	0.21	5.0
INMT 15010	<b>Machine Tool Blueprint Read</b>	0.83	20.0	INMT 35060	<b>Groove and Part on the Lathe</b>	0.13	3.0
INMT 15020	<b>Geometric Dimension Tolerance</b>	0.33	8.0	INMT 35070	<b>Cut Radii and External Tapers</b>	0.50	12.0
INMT 20010	<b>Basic Shop Math</b>	0.67	16.0	INMT 35080	<b>Knurling on the Lathe</b>	0.13	3.0
INMT 20020	<b>Machine Tool Math</b>	0.75	18.0	INMT 35090	<b>Boring Internal Tapers</b>	0.67	16.0
INMT 20030	<b>Machinist Scale</b>	0.08	2.0	INMT 35100	<b>Cutting External Threads</b>	0.50	12.0
INMT 20040	<b>Dividers</b>	0.08	2.0	INMT 35110	<b>Cutting Internal Threads</b>	0.42	10.0
INMT 20050	<b>Spring Calipers</b>	0.08	2.0	INMT 35120	<b>Lathe Project</b>	1.25	30.0
INMT 20060	<b>Combination Square</b>	0.08	2.0	INMT 45010	<b>Dial in Vise Tram in Head</b>	0.21	5.0
INMT 20070	<b>Hermaphrodite Calipers</b>	0.08	2.0	INMT 45020	<b>Fly Cutter End Mill Sq Block</b>	0.21	5.0
INMT 20080	<b>Surface Gage</b>	0.08	2.0	INMT 45030	<b>Tilt Head Turn Vise Cut V</b>	0.50	12.0
INMT 20090	<b>Identify Surface Finishes</b>	0.08	2.0	INMT 45040	<b>Digital Read Drill Tap Ream</b>	0.25	6.0
INMT 25010	<b>Micrometer</b>	0.13	3.0	INMT 45050	<b>Turntable Cut Radii</b>	0.33	8.0
INMT 25020	<b>Caliper Digital Vern Dial</b>	0.17	4.0	INMT 45060	<b>Horizontal Milling Saw Slot</b>	0.17	4.0
INMT 25030	<b>Telescoping Gages</b>	0.13	3.0	INMT 45070	<b>Sine Plate Cut Angles</b>	0.33	8.0
INMT 25040	<b>Depth Micrometer</b>	0.13	3.0	INMT 45080	<b>Boring Head Bore 4 Holes</b>	0.33	8.0
INMT 25050	<b>Dial Indicators</b>	0.13	3.0	INMT 45090	<b>Indexing Head to Cut Keyways</b>	0.17	4.0
INMT 25060	<b>Gage Blocks</b>	0.13	3.0	INMT 45100	<b>Math for Dividing Head</b>	0.17	4.0
INMT 25070	<b>Machine Shop Trigonometry</b>	0.67	16.0	INMT 45110	<b>Dividing Head to Cut Gears</b>	0.42	10.0
INMT 25080	<b>Height Gage</b>	0.17	4.0	INMT 45120	<b>Universal Indexing Head</b>	0.50	12.0
INMT 25090	<b>Sine Bar</b>	0.17	4.0	INMT 45130	<b>5C Collet to Cut Square Hex</b>	0.33	8.0
INMT 30010	<b>Shop Math Speeds and Feeds</b>	0.21	5.0	INMT 45140	<b>Make Dove Tails</b>	0.67	16.0
INMT 30020	<b>Sharpening Drill Bits</b>	0.25	6.0	INMT 45150	<b>Mill Project</b>	1.25	30.0
INMT 30030	<b>Drilling on the Drill Press</b>	0.17	4.0	INMT 50010	<b>Square a Block (6 Sides)</b>	0.25	6.0
INMT 30040	<b>Reaming on the Drill Press</b>	0.13	3.0	INMT 50020	<b>Grind Angles and Radii</b>	0.50	12.0
INMT 30050	<b>Counterbore Spotface Countersi</b>	0.21	5.0	INMT 50030	<b>Operate The Automatic Grinder</b>	0.42	10.0
INMT 30060	<b>Hand Tap on the Drill Press</b>	0.21	5.0	INMT 50040	<b>Complete Two Projects to Print</b>	1.58	38.0
INMT 30070	<b>Power Tap on the Drill Press</b>	0.25	6.0	INMT 70010	<b>Sine Bar</b>	0.83	20.0
INMT 30080	<b>Drill Press Project</b>	0.58	14.0	INMT 70020	<b>Precision Vise</b>	2.08	50.0
INMT 30090	<b>Band Saw Blade Welding</b>	0.25	6.0	INMT 70030	<b>1-2-3 Blocks</b>	1.00	24.0
INMT 30100	<b>Vertical Band Saw Project</b>	0.25	6.0	INMT 70040	<b>Tool Makers V-Blocks</b>	1.67	40.0
INMT 35010	<b>Maintaining the Lathe</b>	0.17	4.0	*INMT C710	<b>Basic Machining Project</b>		2.0
INMT 35020	<b>Grinding Lathe Tools</b>	0.25	6.0				

\*Module(s) cannot be paid for using certain types of financial aid. Please direct all inquiries to the staff at the RMTC registration desk.

Please note: Kellogg Community College offers additional Industrial Machining Technology courses at the Regional Manufacturing Technology Center in Battle Creek

# Industrial Welding Courses offered at Hastings High School\*

\*Availability of this program is dependent on enrollment.

SUBJECT/COURSE#	TITLE	CREDIT HOURS	CONTACT HOURS
INWE C910	<b>Welding Orientation</b>		2.0
INWE 05010	<b>Welding Shop Safety Rules</b>	0.17	4.0
INWE 05020	<b>Joints Welds Positions</b>	0.13	3.0
INWE 05030	<b>Rules and Squares</b>	0.13	3.0
INWE 10010	<b>Oxy-Fuel Welding Terms</b>	0.17	4.0
INWE 10020	<b>Set Up Oxy-Fuel Weld Stat</b>	0.08	2.0
INWE 10030	<b>Run Beads w/wo Fill</b>	0.29	7.0
INWE 10040	<b>Weld Joints Flat Position</b>	1.00	24.0
INWE 15010	<b>Basic Cutting Practices</b>	0.13	3.0
INWE 15020	<b>Cut Ferrous Met w Oxy Fuel</b>	0.33	8.0
INWE 15030	<b>Cutting Metals w Plasma</b>	0.33	8.0
INWE 20010	<b>Braz Joints Flat Position</b>	0.33	8.0
INWE 20020	<b>Braz V-Groove Joints</b>	0.21	5.0
INWE 20030	<b>Silver Braz Dissimilar Metals</b>	0.13	3.0
INWE 20040	<b>Lead Soldering Seams</b>	0.25	6.0
INWE 25010	<b>SMAW Terms Definitions</b>	0.17	4.0
INWE 25020	<b>Electrodes for SMAW</b>	0.21	5.0
INWE 25030	<b>Strike Arc Run Beads</b>	0.67	16.0
INWE 25040	<b>Analyze Weld Characteristics</b>	0.13	3.0
INWE 25050	<b>Multipass Fillet Welds</b>	0.50	12.0
INWE 25060	<b>Weld Size Weave Technique</b>	0.50	12.0
INWE 25070	<b>Corner Joint Flat Position</b>	0.67	16.0
INWE 25080	<b>V-Groove Butt W Backing</b>	0.50	12.0
INWE 25090	<b>V-Groove Butt wo Backing</b>	0.67	16.0
INWE 30010	<b>Tee Joints Vertical Up</b>	0.58	14.0
INWE 30020	<b>Butt w Back Vertical Up</b>	0.46	11.0
INWE 30030	<b>Butt wo Back Vertical Up</b>	0.75	18.0
INWE 30040	<b>Tee Joints Vertical Down</b>	0.29	7.0
INWE 30050	<b>Butt w Back Vertical Down</b>	0.42	10.0
INWE 30060	<b>Butt Wo Back Vertical Down</b>	0.33	8.0
INWE 30070	<b>Butt w Back Horizontal</b>	0.50	12.0
INWE 30080	<b>Butt wo Back Horizontal</b>	0.50	12.0

SUBJECT/COURSE#	TITLE	CREDIT HOURS	CONTACT HOURS
INWE 30090	<b>Tee Joints Overhead</b>	0.50	12.0
INWE 30100	<b>Butt w Back Overhead</b>	0.58	14.0
INWE 30110	<b>Butt wo Back Overhead</b>	0.83	20.0
INWE 35010	<b>Intro to Metallurgy</b>	0.46	11.0
INWE 35020	<b>Examine Identify Metals</b>	0.13	3.0
INWE 35030	<b>Metallurgy Fund Cast Iron</b>	0.13	3.0
INWE 35040	<b>Metallurgy Fund Stainless</b>	0.13	3.0
INWE 35050	<b>Testing Metals</b>	0.42	10.0
INWE 40010	<b>Explaining GMAW</b>	0.29	7.0
INWE 40020	<b>Start Arc Run Beads GMAW</b>	0.17	4.0
INWE 40030	<b>GMAW FCAW Weld All Positions</b>	1.67	40.0
INWE 45010	<b>Explaining GTAW</b>	0.42	10.0
INWE 45020	<b>Start Arc Run Beads GTAW</b>	0.42	10.0
INWE 45030	<b>GTAW Aluminum Flat Position</b>	1.25	30.0
INWE 45040	<b>Basic Joints Stainless</b>	1.25	30.0
INWE 45050	<b>GTAW Aluminum Out Position</b>	1.67	40.0

Please note: Kellogg Community College offers additional Industrial Welding courses at the Regional Manufacturing Technology Center in Battle Creek and the Eastern Academic Center in Albion.

# Industrial Welding Courses offered at Eastern Academic Center

For more information visit [kellogg.edu/albion](http://kellogg.edu/albion)

SUBJECT/COURSE#	TITLE	CREDIT HOURS	CONTACT HOURS
INWE C910	<b>Welding Orientation</b>		2
INWE 05010	<b>Welding Shop Safety Rules</b>	0.17	4
INWE 05020	<b>Joints Welds Positions</b>	0.13	3
INWE 05030	<b>Rules and Squares</b>	0.13	3
INWE 10010	<b>Oxy-Fuel Welding Terms</b>	0.17	4
INWE 10020	<b>Set Up Oxy-Fuel Weld Stat</b>	0.08	2
INWE 10030	<b>Run Beads w wo Fill</b>	0.29	7
INWE 10040	<b>Weld Joints Flat Position</b>	1.00	24
INWE 15010	<b>Basic Cutting Practices</b>	0.13	3
INWE 15020	<b>Cut Ferrous Met w Oxy Fuel</b>	0.33	8
INWE 15030	<b>Cutting Metals w Plasma</b>	0.33	8
INWE 20010	<b>Braz Joints Flat Position</b>	0.33	8
INWE 20020	<b>Braz V-Groove Joints</b>	0.21	5
INWE 20030	<b>Silver Braz Dissimilar Metals</b>	0.13	3
INWE 20040	<b>Lead Soldering Seams</b>	0.25	6
INWE 25010	<b>SMAW Terms Definitions</b>	0.17	4
INWE 25020	<b>Electrodes for SMAW</b>	0.21	5
INWE 25030	<b>Strike Arc Run Beads</b>	0.67	16
INWE 25040	<b>Analyze Weld Characteristics</b>	0.13	3
INWE 25050	<b>Multipass Fillet Welds</b>	0.50	12
INWE 25060	<b>Weld Size Weave Technique</b>	0.50	12
INWE 25070	<b>Corner Joint Flat Position</b>	0.67	16
INWE 25080	<b>V-Groove Butt W Backing</b>	0.50	12
INWE 25090	<b>V-Groove Butt wo Backing</b>	0.67	16
INWE 30010	<b>Tee Joints Vertical Up</b>	0.58	14
INWE 30020	<b>Butt w Back Vertical Up</b>	0.46	11
INWE 30030	<b>Butt wo Back Vertical Up</b>	0.75	18
INWE 30040	<b>Tee Joints Vertical Down</b>	0.29	7
INWE 30050	<b>Butt w Back Vertical Down</b>	0.42	10
INWE 30060	<b>Butt Wo Back Vertical Down</b>	0.33	8
INWE 30070	<b>Butt w Back Horizontal</b>	0.50	12
INWE 30080	<b>Butt wo Back Horizontal</b>	0.50	12
INWE 30090	<b>Tee Joints Overhead</b>	0.50	12

SUBJECT/COURSE#	TITLE	CREDIT HOURS	CONTACT HOURS
INWE 30100	<b>Butt w Back Overhead</b>	0.58	14
INWE 30110	<b>Butt wo Back Overhead</b>	0.83	20
*INWE C410	<b>SMAW Certification</b>		6
INWE 35010	<b>Intro to Metallurgy</b>	0.46	11
INWE 35020	<b>Examine Identify Metals</b>	0.13	3
INWE 35030	<b>Metallurgy Fund Cast Iron</b>	0.13	3
INWE 35040	<b>Metallurgy Fund Stainless</b>	0.13	3
INWE 35050	<b>Testing Metals</b>	0.42	10
INWE 40010	<b>Explaining GMAW</b>	0.29	7
INWE 40020	<b>Start Arc Run Beads GMAW</b>	0.17	4
INWE 40030	<b>GTAW FCAW Weld All Positions</b>	1.67	40
INWE 40040	<b>GMAW of Aluminum</b>	0.67	16
*INWE C420	<b>GMAW Certification</b>		6
INWE 45010	<b>Explaining GTAW</b>	0.42	10
INWE 45020	<b>Start Arc Run Beads GTAW</b>	0.42	10
INWE 45030	<b>GTAW Aluminum Flat Position</b>	1.25	30
INWE 45040	<b>Basic Joints Stainless</b>	1.25	30
INWE 45050	<b>GTAW Aluminum Out Position</b>	1.67	40
*INWE C430	<b>GTAW Certification</b>		8
INWE 50010	<b>Identifying Pipe Welding</b>	0.21	5
INWE 50020	<b>2G Fixed Position</b>	0.83	20
INWE 50030	<b>5G Fixed Vertical Up</b>	1.25	30
INWE 50040	<b>5G Fixed Vertical Down</b>	1.04	25
INWE 50050	<b>6G Fixed Position</b>	1.04	25
INWE 55010	<b>Welding Blueprint Reading</b>	0.17	4
INWE 55020	<b>Fabricating a Project</b>	0.50	12
INWE 55030	<b>Cast Iron Repair</b>	0.17	4
INWE 55040	<b>Hardsurfacing</b>	0.17	4
INWE 55050	<b>Tool and Die Welding</b>	0.67	16
*INWE C710	<b>Basic Welding Project</b>		2
*INWE C720	<b>Intermediate Welding Project</b>		4
*INWE C730	<b>Advanced Welding Project</b>		6

**PRESTON GRAHAM**  
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*\*Module(s) cannot be paid for using certain types of financial aid. Please direct all inquiries to the staff at the RMTC registration desk.*

# Industrial Electricity and Electronics Courses offered at Eastern Academic Center

For more information visit  
[kellogg.edu/albion](http://kellogg.edu/albion)

SUBJECT/COURSE#	TITLE	CREDIT HOURS	CONTACT HOURS
INEL C910	Electric Electronics Orientation		2
INEL 05010	Electrical Safety	0.17	4
INEL 10010	Electrical Math 1	0.08	2
INEL 10020	Electrical Math 2	0.25	6
INEL 10030	Electrical Math 3	0.25	6
INEL 15010	Electrical Theory	0.25	6
INEL 15020	Static Electricity	0.25	6
INEL 15030	Calculators and Electronics	0.25	6
INEL 15040	Devices and Symbols	0.25	6
INEL 15050	Multimeter	0.33	8
INEL 15060	Ohm's Law	0.33	8
INEL 15070	Series Circuits	0.33	8
INEL 15080	Parallel Circuits	0.33	8
INEL 15090	Combination Circuits	0.33	8
INEL 15100	Magnetism	0.25	6
INEL 15110	Alternating Current	0.25	6
INEL 15120	Oscilloscope	0.33	8
INEL 15130	Inductance	0.42	10
INEL 15140	Capacitance	0.42	10
INEL 15150	RLC Circuits	0.33	8
INEL 15160	Conduction	0.33	8
INEL 15170	Theory Overview	0.21	5
INEL 20010	Electrical Motor Controls	0.42	10
INEL 20020	Manual Motor Controls	0.50	12
INEL 20030	Control Transformers	0.42	10
INEL 20040	Control Ladder Logic	0.67	16
INEL 20050	Control Relays Motor Starters	0.50	12
INEL 20060	Introduction Troubleshooting	0.33	8
INEL 20070	Systems Troubleshooting	0.42	10
INEL 20080	Automatic Input Devices	0.42	10
INEL 20090	Electronic Sensors	0.33	8
INEL 20100	Basic Timer Control	0.33	8
INEL 20110	Timers and Counters	0.25	6
INEL 25010	Reversing Motor Control	0.33	8
INEL 25020	Braking Methods	0.42	10
INEL 25030	Reduced Voltage Starting	0.33	8
INEL 25040	Intro Frequency Drives (AC)	0.33	8
INEL 25050	AC Drives Speed Torque Cnt	0.33	8
INEL 25060	AC Drives Accel and Decel	0.33	8
INEL 25070	AC Drives Troubleshooting	0.33	8
INEL 25080	SCR Motor Control	0.42	10
INEL 35010	General Wiring Fundamentals	0.25	6
INEL 35020	Wire Raceway And Box Sizing	0.33	8

SUBJECT/COURSE#	TITLE	CREDIT HOURS	CONTACT HOURS
INEL 35030	Branch Circuits	0.33	8
INEL 35040	Service Feeder Calculations	0.25	6
INEL 35050	Grounding and Bonding	0.33	8
INEL 35060	Overcurrent Protection	0.33	8
INEL 35070	Motor Circuit Wiring	0.25	6
INEL 35080	Transformers	0.25	6
INEL 35090	General Hazardous Locations	0.25	6
INEL 35100	Health Care Facilities	0.25	6
INEL 35110	Emergency Power Systems	0.33	8
INEL 35120	Industrial Applications	0.33	8
INEL 35130	Special Application Wiring	0.25	6
INEL 35140	NEC Review	0.17	4
INEL 50010	Electrical Control Wiring	0.42	10
INEL 50020	Electrical Control Systems	1.00	24
INEL 55010	Using the Oscilloscope	0.67	16
INEL 55020	Meters for Electronics	0.33	8
INEL 55030	Electronic Soldering	0.25	6
INEL 55040	Soldering Printed Circuit Boar	0.25	6
INEL 55050	Diodes	0.25	6
INEL 55060	Power Supplies	0.50	12
INEL 55070	Photo Devices	0.33	8
INEL 55080	Solid State Devices	0.83	20
INEL 55090	Electronic Timing	0.33	8
INEL 55100	Amplifiers	0.83	20
INEL 55110	Digital Logic Fundamentals	0.50	12
INEL 55120	Digital Logic Applications	0.42	10
INEL 55130	Proximity Switching	0.17	4
INEL 55140	Photoelectric Devices	0.17	4
INEL 55150	Fiber Optic Fundamentals	0.33	8
INEL 55160	Fiber Optic Lab	0.25	6
INEL 75010	Intro to Compact Logix PLCs	0.25	6
INEL 75020	Creating RS Logix 5000 Projec	0.25	6
INEL 75030	Ethernet Communication Proto	0.42	10
INEL 75040	Creating RS Logix 5000 Progra	0.42	10
INEL 75050	TON TOF RTO Counter Instructi	0.42	10
INEL 75060	CU and CD Counter Instruction	0.42	10
INEL 70010	Introduction to Panel View	0.17	4
INEL 70020	Terminal Overview	0.25	6
INEL 70030	Wiring and Set Up	0.25	6
INEL 70040	Terminal Configuration	0.25	6
INEL 70050	Troubleshooting Maintenance	0.25	6
INEL 70060	Programming Panel View	0.83	20
INEL 70070	Panel View PLC Applications	1.04	25
INEL 70080	Panel View PLC Communication	0.21	5

## DANNY WEBB

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*Please note: Kellogg Community College offers additional Industrial Electricity/Electronics courses at the Regional Manufacturing Technology Center in Battle Creek.*

## Industrial Technology Courses offered at Eastern Academic Center

For more information visit  
[kellogg.edu/albion](http://kellogg.edu/albion)

SUBJECT/COURSE#	TITLE	CREDIT HOURS	CONTACT HOURS
INT C910	Ind Technology Orientation		2
INT 15010	Fundamentals of Print Reading	0.92	22
INT 15030	Electrical Prints	0.29	7
INT 30010	Manufacturing Safety	1.00	24
INT 30020	OSHA 10	0.92	22
INT 30040	Arc Flash Lockout Tagout	0.29	7
INT 30060	Intro to Power Transmissions	0.13	3
INT 30070	Couplings	0.17	4
INT 30080	Clutches and Brakes	0.33	8
INT 30090	Flat Belt Drives	0.25	6
INT 30100	V Belt Drives	0.25	6
INT 30110	Chain Drives	0.25	6
INT 30120	Speed Reducers	0.25	6
INT 30130	Gears	0.25	6
INT 30140	Lubricants and Lubrication	0.17	4
INT 30160	Oils and their Applications	0.08	2
INT 30230	Bearing Installation Removal	0.50	12
INT 30320	Hand and Power Tools	0.67	16
INT 35010	Introduction to Robotics	0.67	16
INT 35020	Robot Programming	1.29	31
INT 40020	Ind Maintenance Troubleshootin	0.92	22
INT 40030	Preventive Predictive Mainten	1.25	30
INT 40120	Facts About Air	0.33	8
INT 40130	Air Preparation	0.33	8
INT 40140	Air Piping	0.33	8
INT 40150	Pneumatic Actuators	0.33	8
INT 40160	Pneumatic Valves	0.33	8
*INT C450	MSSC Maintenance Assessment		1.5

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\*Module(s) cannot be paid for using certain types of financial aid. Please direct all inquiries to the staff at the RMTC registration desk.

Please note: Kellogg Community College offers additional Industrial Technology courses at the Regional Manufacturing Technology Center in Battle Creek.

## Maintenance Technician Certificate offered at Eastern Academic Center

For more information visit  
[kellogg.edu/albion](http://kellogg.edu/albion)

SUBJECT/COURSE#	TITLE	CREDIT HOURS	CONTACT HOURS
INT C910	Ind Technology Orientation		2
<b>REQUIRED COURSES:</b>			
INT 15010	Fundamentals of Print Reading	0.92	22
INT 15020	Machine Prints	0.17	4
INT 30010	Manufacturing Safety	1.00	24
INT 30020	OSHA 10	0.92	22
INT 30040	Arc Flash Lockout Tagout	0.29	7
INT 30060	Intro to Power Transmissions	0.13	3
INT 30070	Couplings	0.17	4
INT 30080	Clutches and Brakes	0.33	8
INT 30100	V Belt Drives	0.25	6
INT 30110	Chain Drives	0.25	6
INT 30120	Speed Reducers	0.25	6
INT 30140	Lubricants and Lubrication	0.17	4
INT 30160	Oils and their Applications	0.08	2
INT 30230	Bearing Installation Removal	0.50	12
INT 30320	Hand and Power Tools	0.67	16
INT 40020	Ind Maintenance Troubleshootin	0.92	22
INT 40030	Preventive Predictive Mainten	1.25	30
INT 40120	Facts About Air	0.33	8
*INT C450	MSSC Maintenance Assessment		1.5

**Total for required courses = 8.72 CREDITS**

### ELECTIVES REQUIRED

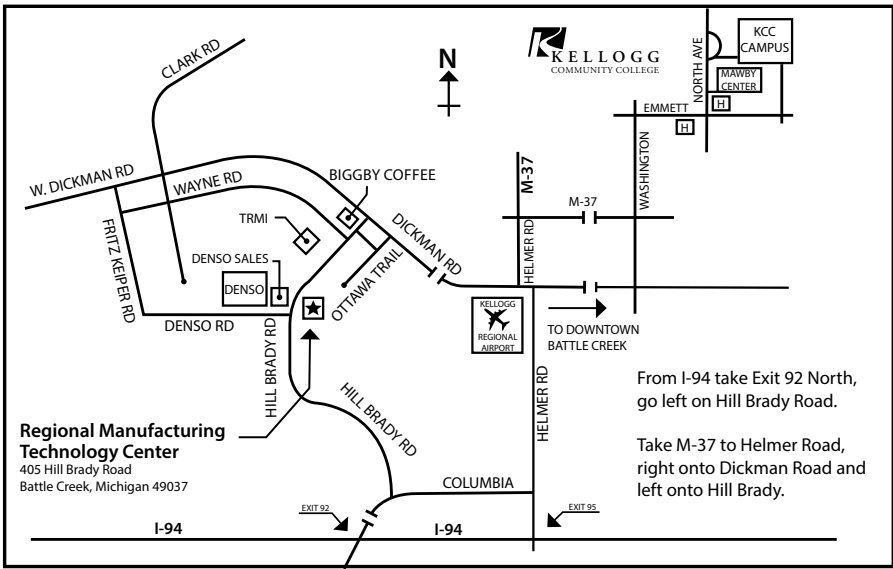
Additional Industrial Trades electives in: INEL, INHR, INMT, INPF, INRE, INST, INTD, INWE and INT minus the required INT courses and/or iACT Electives = 7.28 credits

### MAINTENANCE TECHNICIAN CERTIFICATE PROGRAM TOTAL CREDITS = 16

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\*Module(s) cannot be paid for using certain types of financial aid. Please direct all inquiries to the staff at the RMTC registration desk.



## DIRECTIONS

### DIRECTIONS TO RMTC

#### FROM M-37/HASTINGS

Drive south on M-37 to Dickman Road/M-96. Turn west/right on Dickman Road/M-96. Drive west on Dickman Road/M-96 to Hill Brady Road. Turn south/left on Hill Brady Road. Drive approximately 0.5 mile to the RMTC on the east/left hand side of the road.

#### FROM I-94 EASTBOUND OR WESTBOUND

Follow I-94 to Exit 92. Turn north/right on Dr. Martin Luther King Memorial Skyway and continue to Hill Brady Road. Turn northwest/left on Hill Brady Road. Travel approximately 2 miles to the RMTC on the east/right hand side of the road.

#### FROM M-96 GALESBURG/AUGUSTA

Drive east on M-96 to Hill Brady Road. Turn south/right on Hill Brady Road. Drive approximately 0.5 mile on Hill Brady Road to the RMTC on the east/left hand side of the road.

#### FROM DICKMAN ROAD/DOWNTOWN BATTLE CREEK

Drive west on Dickman Road/M-96 to Hill Brady Road. Turn south/left on Hill Brady Road. Drive approximately 0.5 mile on Hill Brady Road to the RMTC on the east/left hand side of the road.

### DIRECTIONS TO KCC BATTLE CREEK CAMPUS

#### FROM I-94 EASTBOUND OR WESTBOUND

Take exit 98B (downtown exit) into town where it blends with Division Street. Remain on Division Street to VanBuren Street (4th signal light). Turn left on VanBuren Street to Capital Avenue (1st light), turn right at the light, and stay in the left lane. The road will curve to the left and become North Avenue. Continue on North Avenue through 4th light (after Battle Creek Health System). The College is located on the right.

#### FROM HASTINGS

Take M-37 to its junction with Morgan Road (just inside Battle Creek city limits). Turn left onto Morgan Road and proceed to North Avenue (signal light). Turn right (south) and continue to College. Circle drive entrance is beyond Spring Lake pond.

#### FROM LANSING

Take I-69 to M-78 exit (Bellevue) and proceed through and beyond (about six miles) to M-66. Turn left on M-66 and proceed south to Roosevelt Avenue (3rd signal light). Turn right and continue to North Avenue. Turn left and proceed to College. Circle drive entrance is beyond Spring Lake pond.

#### BETWEEN RMTC AND KCC MAIN CAMPUS

From Hill Brady Road turn north/right onto Hill Brady road. Drive west on Dickman Road/M-96 to Washington Avenue. Turn north/left onto Washington Avenue. Drive north on Washington Avenue to Emmett Street. Turn east/right on Emmett Street. Drive east on Emmett to North Avenue. Turn north/left on North Avenue. KCC Main Campus is on the east/right hand side of North Avenue.

# CENTER FOR STUDENT SUCCESS

## Free Educational Services

The Center for Student Success provides free educational services to all KCC students.

### SERVICES INCLUDE:

- Professional and Peer Tutoring (in-person and virtual)
- Disability Services
- Make-up & Online Testing
- Proctored Testing for Non-KCC Students
- Perkins Special Populations Grant
- Trio Student Support Services Grant
- Referral to Campus and Community Resources

Contact us today to see how we can help you succeed. KCC's Center for Student Success can be reached at [css@kellogg.edu](mailto:css@kellogg.edu), 269-660-2296, or 269-965-4150. **Go Bruins!**

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Visit us online to learn more!  
[kellogg.edu/CSS](http://kellogg.edu/CSS)

KCC North Ave Campus  
Ohm Building, Rm. 207  
269-660-2296 [css@kellogg.edu](mailto:css@kellogg.edu)





Regional Manufacturing Technology Center  
405 Hill Brady Road  
Battle Creek, MI 49037