

Director of Workforce Development Kansas Board of Regents 1000 SW Jackson St/, Suite 520 Topeka, Kansas 66612-1368

Dear Director and Committee,

Enclosed is a New Program Request application for Critical Environment Technologies program at Manhattan Area Technical College.

In July 2018, MATC was awarded a National Science Foundation Advanced Technological Education (NSF-ATE) grant to develop curriculum for a certificate and an associate of applied science degree in Critical Environments Technology. This innovative program prepares industrial support staff with skills specific to critical laboratory environments.

The development of such a program is in response to the workforce needed to safely and efficiently maintain critical containment environments of biotechnology and life science laboratories along the Animal Health Corridor (from Manhattan, Kansas on the west to Columbia, Missouri on the east along Interstate 70), as well as the National Bio and Agro-defense Facility (NBAF) under construction in Manhattan. The critical environment (containment) laboratories along this corridor have a reported 21% increase in employment from 2009 to 2012, and have projected a need for an additional 15,000 employees over the next ten years to meet the workforce demand of the Animal Health Corridor. It is estimated that this corridor generates over 56% of the global revenue for the animal health industry.

MATC is excited about adding the Critical Environment Technologies program that will provide training towards strengthening risk reduction skills in safety, compliance, and operations required in a growing number of industries that utilize critical laboratory environments to a diverse group of professionals and facilities' technicians to engineers.

Please let me know how I can of further assistance through the approval process.

Respectfully,

Sarah Phillips Vice President Student Success/CAO/CSSO Manhattan Area Technical College

3136 Dickens Avenue | Manhattan, Kansas 66503-2499 | 785-587-2800 | 800-352-7575 | Fax 785-587-2804

## **New Program Request Form**

### **General Information**

Institution submitting proposal	Manhattan Area Technical College
Name, title, phone, and email of person submitting the application (contact person for the approval process)	Morgen Stoecklein – Registrar 785-320-4544 morgenstoecklein@manhattantech.edu
Identify the person responsible for oversight of the proposed program	Sarah Phillips, Vice President Student Success/CAO/CSSO
Title of proposed program	Critical Environments Technologies (CET)
Proposed suggested Classification of Instructional Program (CIP) Code	15.0599
CIP code description	Environmental Control Technologies/Technicians, Other
Standard Occupation Code (SOC) associated to the proposed program	17-3029
SOC description	All engineering technologists and technicians, except drafters, not listed separately.
Number of credits for the degree <u>and</u> all certificates requested	Certificate B – 38 SCH AAS Degree – 62 SCH
Proposed Date of Initiation	Fall 2020
Specialty program accrediting agency	N/A
Industry certification	OSHA30; NCCER Industrial Maintenance Electrical & Instrumentation, Instrumentation, and Industrial Maintenance Mechanic

Signature of College Official

Date <u>8.5.20</u>

Signature of KBOR Official\_

Date\_\_\_\_

### Narrative

Completely address each one of the following items for new program requests. Provide any pertinent supporting documents in the form of appendices, (i.e., minutes of meetings, industry support letters, CA1-1a form).

### **Program Description**

Provide a complete catalog description (including program objectives) for the proposed program. List and describe the admission and graduation requirements for the proposed program.

### Catalog Description

The Critical Environment Technologies (CET) Program prepares students to work on building systems in high-containment laboratories, clean rooms, hospitals, data centers, production facilities, clean-rooms, and other facilities that require special skills and knowledge to maintain critical environments.

Students are given a foundation of knowledge and skills that are highly valued in any facility management position—in electrical, IT and BACnet, building system automation technologies, HVAC, plumbing, lighting, and security systems. For each building system, special considerations with regard to critical environments is stressed: the criticality of maintaining tight pressure-differences in HVAC systems, HEPA filtration needs and procedures, biosafety cabinet and fume hood effects, no-fail electrical and backup systems, multi-level and high security, waste neutralization, and the special safety gear and safe practices required for working in high-containment. The interdependency of automated building systems, and the criticality of understanding this interdependency with respect to safety, is emphasized. Chart of Competencies are available in Appendix A.

A strict and serious safety culture is upheld. Students begin the program with two required safety courses, an OSHA 30 course and a Biohazards Risk Reduction course, and then continue to learn aspects of safety associated with building systems and critical environments throughout the program.

### Program Objectives

- To make Kansas the first State in the nation to offer technical degree and certificate programs for students wishing to pursue careers in critical environment technologies.
- To provide mechanical and electrical competencies that will allow students to pursue careers in bio-containment laboratories and other critical environments.
- To enhance a workforce by providing specialized knowledge and skills required to safely perform operational and maintenance duties within critical environment facilities.
- To educate students in fundamental concepts that will allow them to operate, maintain, and troubleshoot building system-related equipment, including those associated with critical environments.
- Properly follow procedures for donning personal protective equipment, entering biocontainment facilities, and conducting maintenance and operational tasks in critical environments.

### Admission Requirements

### Program Seeking Students

Students who wish to attend a Manhattan Tech academic program must submit the materials below to be considered for admission:

- 1. Complete college application and application fee (found online at manhattantech.edu)
- 2. Official transcript verifying graduation and final grades from an accredited high school, registered home school, or a General Education Development (GED<sup>®</sup>) diploma.
- 3. ACT scores within the last three years, if available.
- 4. Meet college placement assessment criteria, unless exempt from assessment based on ACT scores. Refer to Entrance Assessment section for additional details.

### High School/Concurrent Enrollment/Dual Credit Students

Students may receive concurrent high school/college credit, which can be applied toward a Manhattan Tech technical certificate/degree following the student's high school graduation. (Part-time enrollments will be considered if program space is available.)

Students interested in enrolling should refer to www.manhattantech.edu/concurrent for more information and consult with their guidance counselor to determine course interest and eligibility.

Admission/Enrollment Guidelines for Concurrent Credit/Dual Credit for High School Students:

- Students must be classified as a sophomore, junior, or senior in high school.
- Students must have a cumulative GPA of 2.5 or higher.
- Students must take the ACCUPLACER or show qualifying ACT scores to enroll in English Composition I and/or College Algebra. To schedule a placement test, visit <u>www.manhattantech.edu/proctor</u>
- Students are required to attend an enrollment session at their respective high school and submit their completed Concurrent Enrollment Form/Parent Financial Agreement. Students should check with their guidance counselor or the Manhattan Tech website for specific dates/deadlines, enrollment forms, and payment information.

Please note: these guidelines also apply to homeschooled students receiving dual credit.

High school students wishing to enroll in courses held on campus at Manhattan Tech or online who are not obtaining Dual Credit will follow standard entrance specifications. Refer to General Admission Requirements for those provisions.

### Graduation Requirements

Students who intend to graduate with a technical Certificate and/or Associate Applied Science degree must complete the following requirements to graduate and/or participate in commencement exercises:

- Submit the Intent to Graduate form (available on MATC Online) and \$25 fee.
- Satisfactorily complete all course work for technical certificate/degree.
- Achieve a cumulative GPA of 2.0 or higher.
- Have no more than 6 credit hours of course requirements remaining to complete the Certificate/Degree.
- Fulfill all financial obligations to Manhattan Tech as well as Financial Counseling, if applicable.

### **Demand for the Program**

- Using the Kansas Department of Labor's Long Term Occupational Outlook, (https://klic.dol.ks.gov) identify employment trends and projections: occupational growth, occupational replacement rates, estimated annual median wages, and typical education level needed for entry.
- Show demand from the local community. Provide letters of support from at least three potential employers, which state the specific type of support they will provide to the proposed program.
- Describe/explain any business/industry partnerships specific to the proposed program.
- If a formal partnership agreement exists, agreement explaining the relationship between partners and to document support to be provided for the proposed program must be submitted to the Board office independently of the CA1 materials for review purposes. The agreement will not be published or posted during the comment period.

KDOL data is currently unavailable for engineering technicians pursuing specific careers in Critical Environment Technologies, because this is an emerging career path that crosses current occupational categories. However, graduates of MATC's Critical Environment Technology program will be prepared to work in a variety of facilities, including normal commercial or industrial buildings as well as in those that require maintenance of critical environments (laboratories, hospitals, data centers, drug research and production, food research and production). As an integral part of the Animal Health Corridor, Manhattan, Kansas is seeing increased research and business enterprise activity. The corridor covers a number of bioscience industries including the Kansas City Life Science industry. KDOL data for some occupations for which CET graduates will be prepared to pursue are included in the Appendix B.

Additional information and data supporting development of the new CET Program follows:

**Local, State, and National Need**. The Manhattan Area Technical College (MATC) seeks to be the first college in the nation to provide a degree and certificate program in Critical Environment Technologies (CET). Situated in Manhattan, Kansas, MATC is an ideal location for developing and upgrading a workforce skilled in building and facilities management of critical environments for the following reasons:

 <u>The Kansas City Life Science Institute</u>, in a 2015 census report, documented a growth rate of 25% in business related to bioscience in the corridor in a 4-year period (2012-2015), going from 187 groups in 2012 to 249 in 2015. The current bioscience workforce exceeds 22,000, with a projected need for 15,000 more employees by 2025.

This is a workforce sector that has local, regional, state, national, and global implications. Consider the following information:

- MATC received and implemented a successful National Science Foundation (NSF) grant to start a biotechnology program when the announcement was made about NBAF coming to Manhattan;
- MATC was one of only two organizations to receive an NBAF Innovation Prize, with the purpose of the College developing and piloting a biosafety training program;
- MATC received an NSF Advanced Technological Grant to develop and implement a critical environment engineering technician program;

The proof for the need for these training programs is evident in a report from the Kansas City Life Sciences Institute (2015):

- 249 companies along the I-70 corridor (from Manhattan, KS to Columbia, MO), and 62 of those companies have come into existence since 2012,
- Those 249 companies currently employ 22,000 persons,
- Kansas is home to 62% of those companies and 42% of the employees,
- Biotech research and testing and drug/pharmaceutical companies comprise 58% of the total number of current businesses along the corridor,
- The 4 major research universities along the corridor receive more than \$550 million annually for bioscience research,
- The group estimates a need for an additional 13,000-17,000 employees in the areas of animal health, food science, health information technology, pet foods, cancer research, neuroscience along the corridor over the next 10 years.
- <u>National Bio- and Agro-defense Facility (NBAF)</u>. Manhattan is the home to the NBAF research laboratory is a \$1.4 billion-dollar facility currently under construction and expected to be commissioned and operational by 2023. This will be the nation's only Biosafety Level 4 (BSL-4) large animal Ag laboratory, as well as multiple BSL2-3 level units, which means it will require the highest level of biosafety precautions, as personnel will work with pathogens that cause fatal diseases that have no currently available treatments. NBAF adds to the existing and robust bioscience industry in the corridor, which includes animal health, human and pet food research and pharmaceuticals.
  - Initial Multi-Year Hiring. In June 2019, the USDA hosted a Career Fair to try to fill approximately 100 positions. The flyer advertised a need to "fill approximately 100 positions" in the areas of "operational staff, facility maintenance personnel, and administrative support positions." According to Ken Burton, who is involved in the USDA APHIS hiring for NBAF, says that NBAF plans to hire approximately 400 operational personnel within the next three years, including 100 in 2019, 100 more in 2020. These hires will include facilities personnel, who will require skills that will be taught in the CET Program regarding HVAC, building automation, and the interdependence of various building systems. All employees will need an understanding of biohazards and personal safety. NBAF Director, Alfonso Clavijo stresses the continual challenges associated with training all of the staff. (Radio clip from KMAN's "In Focus" program: https//1350kman.com/in-focus-11-7-19/).
  - Ongoing Needs. According to Jason Hinkson (NBAF USRO Supervisor) and Susan Weekly (Biorisk Manager), NBAF expects to continue to hire for facilities-related positions, both for start-up in 2023 and to cover growth and attrition. Ongoing skills needs will include:
    - HEPA Filter Upkeep. Recent estimates by NBAF facilities managers are that there will be over 780 HEPA filters on the air system of the new facilities, plus additional HEPA filters in the biosafety cabinets. This alone will create at least 8 full-time positions (4 teams of 2 people to test and maintain these filters daily). People with knowledge of building automation, biosafety risk reduction, and building systems will be needed. NBAF plans to send employees regularly to the east coast for training on HEPA filtration, since adequate training in Kansas does not yet exist.
    - <u>Biosafety Cabinet (BSC)-Upkeep</u>. NBAF will have a long-term need for technicians to operate, install, maintain, test, inspect and decontaminate BSCs. NBAF plans to send employees regularly to the east coast for training on BSCs, since adequate training in Kansas does not yet exist.
    - <u>Building Systems & CET: HVAC</u>. There will be a great need for HVAC technicians who understand how to operate, test and balance airflow for containment areas and clean rooms. The NBAF HVAC system will be complicated to control. Some labs in NBAF will use a

common AHU, but each will have a separate exhaust. They will all be filtered on both supply and exhaust routes. Check valves will be located throughout to ensure no backflow, and anytime there is loss of appropriate pressure differences, the building and each area will be automatically locked off and sealed. One problem in the midwest will be that storms and high winds can upset the system, causing automatic locking and sealing.

- <u>Building Systems: Plumbing and Waste Neutralization</u>. NBAF will use steam-injected, autoclaves to sterilize solid waste and will use giant pressure vessels run at 285F to sterilize all wastewater before it exits the building. All solid waste will be "killed twice," once by autoclave treatment and then by incineration. Technicians who understand plumbing and waste neutralization in critical environments will be needed.
- <u>Building Systems Security & Electrical</u>. NBAF will require heightened security and more rigorous backup power systems than typical building systems. Technicians who understand electrical and security concepts important to critical environments will be needed.
- <u>Controls & Automation</u>. More so than in normal commercial buildings, building automation will be of critical importance to NBAF. Control systems will be used to maintain HVAC, plumbing, waste neutralization, security, and electrical systems with tighter tolerances, more stringent alarm protocols, and higher criticality of automated fail-safe procedures. Technicians who understand building automation concepts related to Critical Environment Technologies will be needed.
- <u>Biosecurity Research Institute (BRI)</u>. Manhattan, Kansas is also the home of BRI, a BSL-3 laboratory, which means it requires the second highest level of biosafety precautions.
- <u>Kansas State University (KState) College of Veterinary Medicine's Diagnostic Labs</u>. K-State's Vet Med labs include BSL-2 laboratories, which require the third highest level of biosafety precautions.
- <u>Contractor Support</u>. BSL laboratories such as NBAF, BRI, and K-State Vet Med will rely on outside contractors for construction and maintenance support. Local Kansas companies, such as US Engineering, P1 Group, and KBS Constructors already recognize the need to have employees who understand building facility issues and critical environment technologies.

A recent survey by MATC and KBS to more than three dozen representatives of critical environment businesses and agencies revealed the following training preferences:

- 80% indicated that their company would benefit from critical environment training in the areas of air handling systems, decontamination systems, valves and controls, filtration systems, building automation systems, waste treatment systems;
- The respondents indicated that over five years they will need 300+ employees skilled in these areas of critical environment technology. Two-thirds of the respondents indicated their company has partial and/or full tuition reimbursement opportunities for their employees.
- Several professional laboratory groups indicate there is a ratio of 1:7 in research and production facilities: for every 1 research scientist there is a need for 7 support personnel (technicians, safety, operations and maintenance, administration, etc.).
- <u>Animal Health Corridor</u>. Over the last decade, Kansas has successfully worked to position itself as home to a thriving Animal Health Corridor, attracting companies in bioscience research and other animal health-related industries. It has also attracted new companies in Life Sciences, such as pharmaceutical and medical research companies. Manhattan, Kansas is well-suited to serve these

companies by building a pipeline of facilities personnel who understand the special facility-based needs of laboratories, hospitals, and other critical environments.

### **Additional Supporting Information**

- John Henneman, Director of Biocontainment Operations for the Biosecurity Research Institute (BRI) John Henneman wrote in an email (11/7/19) to MATC's CET Program Director, Gina Becker, that there is an "urgent need for evening classes that would benefit facilities staff." He also suggested that "NBAF is hiring and will have a need for this type of training over all the possibilities you mention."
- Laney College. A research team at Laney College, which was funded by the National Science Foundation to conduct research on facilities operations jobs, notes that even though there is 72 billion SQFT of commercial and institutional buildings in the U.S., there are "few formal training programs available for technicians, operators, and facilities managers." Consequently, many expensive, installed building technologies, which could optimize building performance and lower energy use, go underutilized because of the shortage of knowledgeable technicians to operate and maintain these systems. As more and more buildings are automated, and as employers discover the financial benefits and quality control benefits of automation, the need for skilled building automation technicians is expected to increase.
  - More information is available in the report, "Current Situations and Trends in Buildings and Facilities Operations" (2010), which can be found at https://www.bestctr.org/researchreports/)
- <u>HVAC Technology Evolving Rapidly</u>. HVAC technology is evolving quickly, and there is a growing demand for HVAC technicians with special skills. According to Kevin Burns in his article, "4 Reasons HVAC Technicians Continue to be in High Demand,

HVAC technicians are in high demand to build, install, and maintain our constantly evolving systems, and experts predict the demand of HVAC technicians will only rise through 2026. The Bureau of Labor Statistics specifically predicted a growth of 21 percent in the field between 2012 and 2022... ...As new HVAC technologies become more and more sophisticated, technicians become more valuable for their experience and specific training. Today's complex HVAC systems and their components require technically skilled technicians who can adapt to the changing landscape.

This is largely because HVAC systems are increasingly integrated into the digital landscape through IoT. Smart HVAC systems use technologies like sensors and timers to automate temperature control for our homes and buildings; setting them up and keeping them working properly requires the work of software specialists and tech-savvy technicians.

• More information can be found at <u>https://www.achrnews.com/blogs/16-guest-blog/post/136601-reasons-hvac-technicians-continue-to-be-in-high-demand</u>

The CET Program will equip technicians to work on highly automated HVAC systems, and to understand the special testing and balancing required to operate HVAC in high-containment labs and other critical environments. These technicians would also be equipped to work on high-tech building systems in non-critical environments.

### **Letters of Support**

Letters of support from local industry are provided in the Appendix C from the following industry contacts:

- Kimberly Young, President KC Animal Health Corridor
- Steve Spade, Business Development KBS Construction, Inc.
- Richard Jones Jr., General Manager U.S. Engineering Service
- Todd Helmut, Controls Department Manager, Five Star Mechanical Inc
- Dr. Peter K. Dorhout, Vice President for Research Kansas State University Dr. April Mason, Provost and Senior Vice President – Kansas State University

### **Business / Industry Partnerships**

The following partnerships exist between MATC and business/industry:

### • National Science Foundation (NSF)

MATC was awarded a \$511,599 grant from the National Science Foundation through their Advanced Technological Education (ATE) program. The grant funds CET program development costs for three years, starting in July 2018, including funding for program staff, consultants, and equipment. In addition to providing funding, the NSF provides numerous resources, training opportunities, and networking and sharing venues for grant awardees.

### • Association of Controls Professionals (ACP)

Brian Lovell, President and Founder of ACP, has helped MATC develop laboratory designs and start building the building automation controls portion of our new CET Automations Laboratory. He has also connected MATC to supplier discounts, the BEST Center, and other valuable industry contacts.

### • BEST Center

The BEST Center is an NSF-sponsored program that promotes Building Efficiency for a Sustainable Tomorrow. For select technical colleges, the BEST Center offers numerous resources for developing and sustaining programs in building automation technologies, including all-expense paid travel to free workshops. MATC staff have attended several of their workshops, utilized their networking resources, and will use some of the shared curriculum and teaching modules in our academic courses.

### • Biosecurity Research Institute at Kansas State University

The facilities personnel at Biosecurity Research Institute (BRI) have been supportive of MATC's effort to build a CET Program from the beginning. These include John Henneman (Director of Biocontainment Operations), Margaret Juergensmeyer (Biosafety Specialist), Eric Montgomery (Facility Operations and Maintenance Manager), Greg Marlar (Building Management Systems Specialist). BRI support includes serving on the CET Program's Business and Industry Leadership Team, attending brainstorming and planning meetings regarding laboratory design and curriculum, giving teaching tours of the BRI HVAC plenum to show how HVAC works to serve a BSL-3 laboratory, providing instructors for CET courses. BRI has an interest in sending their employees to CET training courses and providing internships for CET Program students. They are a potential employer of future CET Program graduates.

### • National Bio- and Agro- Defense Facility (NBAF)/ USDA

NBAF is the Biosecurity Level 4 (BSL-4) laboratory that is being built, and the USDA will own, manage, and operate the facility once construction and commissioning activities are complete. NBAF and USDA personnel see MATC's CET Program as an important source of education for current and future employees. MATC has met with various staff to determine the types of skills and competencies that will be sought for personnel working in the NBAF facilities group. These staff members include Diana Whipple (USDA ARS Operational Planning Team member), Ken Burton (NBAF Coordinator), Scott McVey (USDA Director of Center for Grain and Animal Health Research), Jason Hinkson (NBAF USRO Supervisor), Susan Weekly (Biorisk Manager), and other facilities personnel. NBAF/ USDA has served on the CET Program's Business and Industry Leadership Team, participated in curriculum and training planning sessions, offered advice on the CET laboratory design, and expressed an interest in sending employees to MATC for ongoing CET-related training. NBAF personnel would like for MATC to expand the CET Program's training on Biosafety Cabinet and HEPA filter maintenance to include nationally recognized certifications, so that they do not have to send employees regularly to the East coast for this training.

### • 5 Star Mechanical and Reliable Controls

5 Star Mechanical, a Wichita-based company, and their controls supplier, Canadian-based Reliable Controls, have enthusiastically served on the CET Program's Business and Industry Leadership Team. They recently donated 16 controllers for the building automation laboratory, and offered future technical consultation and supply donations. They are a potential employer of future CET Program graduates.

### • EasylO

EasyIO is a global supplier of controllers that are particularly suited for building automation, which require graphical block programming, an open-source software skill increasingly popular that has become increasingly popular in building automations. MATC contacted EasyIO to see if there was an interest in partnering on training programs, and then learned that EasyIO had for some time been specifically looking for a technical college for such a partnership. MATC will be trained to offer graphical block programming, which will be incorporated into academic courses. MATC also developed an IT course for building automation professions to which EasyIO will require as a pre-requisite to their other training courses. These training courses will create a revenue stream for MATC, essentially free controllers for classroom teaching, plus a channel for keeping up-to-date on industry trends.

### • U.S. Engineering

U.S. Engineering has been supportive of MATC's effort to build a CET Program from the beginning. Their support includes serving on the CET Program's Business and Industry Leadership Team, attending planning meetings regarding building facilities and design, financial and time donations, advice on curriculum, networking, and potential internships or work study programs. They have paid to send their employees to pilot training courses in the CET Program. They are a potential employer of future CET Program graduates.

### KBS Constructors

KBS Constructors has been supportive of MATC's effort to build a CET Program from the beginning. Their support includes serving on the CET Program's Business and Industry Leadership Team, attending planning meetings regarding building facilities and design, donating David Alexander's time to serve as a consultant, advice on curriculum, and networking. They are a potential employer of future CET Program graduates.

### • P1 Group

P1 Group served on the CET Program's Business and Industry Leadership Team, offered advice on curriculum, helped with networking, and offered to help secure supplies for the CET Program from excess materials from other projects. They have paid to send their employees to pilot training courses in the CET Program. They are a potential employer of future CET Program graduates.

### **Duplication of Existing Programs**

- Identify similar programs in the state based on CIP code, title, and/or content. For each similar program provide the most recent K-TIP data: name of institution, program title, number of declared majors, number of program graduates, number of graduates exiting the system and employed, and annual median wage for graduates existing the system and employed.
- Was collaboration with similar programs pursued:
  - Please explain the collaboration attempt or rationale for why collaboration was not a viable option.

### **Programs with Overlapping Skills**

As mentioned above, the Critical Environment Technologies (CET) Program will address a combination of skills not offered in other technical college programs. Elements of electronics, building automation systems, Information Technology, HVAC, and building systems such as plumbing, waste neutralization, electrical backup, and security will be included, along with an emphasis on biohazards risk reduction and workplace safety in critical environments. Following are data for programs that offer some elements that are included in the CET Program:

### Programs with elements that are included in MATC's CET Program

Name of Institution	Program Title	CIP Code	Award	Total # Declared Majors	Total # Grads	Total # Grads Exited & Employed	Med Wage of Grads Employed
Fort Scott Community College	Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician	47.0201	ASSOC/ CERT	12	6	NA	NA
Highland Community College	Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician	47.0201	ASSOC/ CERT	23	13	9	\$29,792
Johnson County Community College	Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician	47.0201	ASSOC/ CERT	133	30	23	\$39218
Kansas City Kansas Community College	Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician	47.0201	ASSOC/ CERT	104	35	27	\$32564
Manhattan Area Technical College	Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician	47.0201	ASSOC/ CERT	29	NA	NA	NA

(from KTIP Report for 2018 Academic Year)

Neosho County Community College	Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician	47.0201	ASSOC/ CERT	46	16	5	NA
North Central Kansas Technical College	Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician	47.0201	ASSOC/ CERT	17	16	13	\$32067
Salina Area Technical College	Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician	47.0201	ASSOC/ CERT	20	10	8	\$33561
Seward County Community College	Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician	47.0201	ASSOC/ CERT	16	NA	NA	NA
Washburn University Institute of Technology	Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician	47.0201	ASSOC/ CERT	46	17	15	\$33,280
Wichita State University Campus of Applied Sciences and Technology	Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician	47.0201	ASSOC/ CERT	80	29	25	\$34,560
Cloud County Community College	Biology Technician/Biotechnology Laboratory Technician	41.0101	ASSOC/ CERT	NA	NA	NA	NA
Johnson County Community College	Biology Technician/Biotechnology Laboratory Technician	41.0101	ASSOC/ CERT	61	NA	NA	NA
Manhattan Area Technical College	Biology Technician/Biotechnology Laboratory Technician	41.0101	ASSOC/ CERT	19	6	6	\$21,562
Hutchinson Community College	Automation Engineer Technology/Technician	15.0406	ASSOC/ CERT	34	NA	NA	NA
Johnson County Community College	Automation Engineer Technology/Technician	15.0406	ASSOC/ CERT	51	NA	NA	NA
North Central Kansas Technical College	Information Technology	11.0103	ASSOC/ CERT	23	14	NA	NA
Butler Community College	Network and System Administration/Administrator	11.1001	ASSOC/ CERT	12	NA	NA	NA
Manhattan Area Technical College	Network and System Administration/Administrator		ASSOC/ CERT	47	12	7	\$31,112

Butler	System, Networking, and	11.1002	ASSOC/	30	5	NA	NA
Community	LAN/WAN		CERT				
College	Management/Manager						

### Collaboration

The CET Program is a unique program. It will not cover all the topics offered in other HVAC, IT, Biotech, or Automation-focused programs, just as the other programs will not cover all the topics offered under the CET Program. Even a collaboration involving students taking a variety of currently-offered courses from multiple programs would be problematic. Unlike other programs, the CET Program will incorporate critical environment considerations into discussions on course topics throughout the program, often building on CET considerations discussed in one course in a second course. The CET Program will emphasize particular elements of control and automation strategies that are important to HVAC systems in critical environments, for example, and then build upon that information in discussions related to plumbing in critical environments. An attempt to partner with other institutions that are not focused on critical environments would deprive students of the unique perspective offered in a comprehensively designed CET Program.

### **Program Information**

- List by prefix, number, title, and description all courses (including prerequisites) to be required or elective in the proposed program.
- If the proposed program includes multiple curricula (e.g., pathways, tracks, concentrations, emphases, options, specializations, etc.), identify courses unique to each alternative.
- Provide a Program of Study/Degree Plan for the proposed program including a semester-by-semester outline that delineates required and elective courses and notes each program exit point.
- List any pertinent program accreditation available:
  - o Provide a rationale for seeking or not seek said accreditation
  - If seeking accreditation, also describe the plan to achieve it

The following table is a summary of the courses, including prerequisites, that will be required or elective in the CET Program.

Course Prefix/ #	Course Title	SCH	Prereq.
BIO 230	<ul> <li>Biohazards Risk Reduction         This course introduces Good Laboratory Practices (GLP) and Good Manufacturing         Practices (GMP) in the context of biosafety that is ideally practiced in all         containment laboratories. The information presented is consistent with Center for         Disease Control (CDC) and the National Institute of Health (NIH) guidelines.     </li> <li>This course is designed to prepare new facility staff with the basics of biosafety for         work in all levels of containment laboratories, critical or high-performance         environments. It includes a mixture of practical and classroom experiences.         Students satisfactorily completing the assessment will receive a certificate of         completion that identifies biosafety skills demonstrated.</li> </ul>	2	None
CET 101	OSHA 30 General Industry (CET) The OSHA 30 course teaches students about workplace hazards, employee rights, and how to contribute to the safety of the workforce. This course will emphasize elements of OSHA 30 safety related to critical environments. By completing OSHA 30 General Industry the trainee will become certified in multiple aspects of safety, including, but not limited to general industry regulations, health hazard recognition, and hazard communication. The course will be no less than 30 seated hours and will not exceed 7 hours per day.	2	None
CET 111	<ul> <li>AC/DC Circuits I</li> <li>This course is an introduction to basic concepts of electricity: atomic structure, electrical safety, AC and DC current, Ohm's and Kirchoff's laws, power, conductivity, resistance, magnetism and electromagnetism. Students learn to interpret electrical circuit diagrams and properly and safely use electrical instruments and tools.</li> <li>The purpose of this course is to prepare students to work with low-voltage electricity and electrical devices.</li> </ul>	4	None
CET 121	Building Systems & CET: Electrical and Lighting		

	This course introduces students to the design and operational strategies of electrical and lighting systems in typical buildings and in critical environments. Topics include basic airflow principles, ventilation equipment, exhaust requirements, regulatory resources, and automation/ control strategies. Topics include electrical distribution, major electrical equipment in buildings, control and monitoring of electricity, lighting devices and lighting control strategies. The purpose of this course is to prepare students to work on equipment in buildings, including critical environments, that have sophisticated and automated electrical and lighting systems.	2	None
CET 122	<ul> <li>Building Systems &amp; CET: HVAC</li> <li>This course introduces students to the design and operational strategies of HVAC systems in typical buildings and in critical environments. Topics include basic airflow principles, ventilation equipment, exhaust requirements, regulatory resources, and automation/ control strategies.</li> <li>The purpose of this course is to prepare students to work in buildings, including critical environments, that have sophisticated and automated HVAC systems.</li> </ul>	2	None
CET 123	<ul> <li>Building Systems &amp; CET: Security</li> <li>This course introduces students to the design and operational strategies of Security systems in typical buildings and in critical environments. Topics include sensors and devices, security monitoring processes, access control strategies, and automation/ control strategies.</li> <li>The purpose of this course is to prepare students to work in buildings, including critical environments, that have sophisticated and automated Security systems.</li> </ul>	1	None
CET 124	Building Systems & CET: Plumbing and Waste Neutralization The purpose of this course is to prepare students to work in buildings, including critical environments, that have sophisticated and automated Plumbing and Waste Neutralization systems. Modern Information Technology Networks	2	None
CRT 165	Modern Information Technology Networks CompTIA Network+ introduces the configuration, management, and troubleshooting of common wired and wireless network devices. Topics include critical security concepts and tips for working with security practitioners, cloud computing best practices and service models, hardware and virtualization techniques and concepts, and skills to keep a network working and resilient. The purpose of this course is to prepare students to work in buildings, including critical environments, that use networks as part of their automation strategy.	3	None

	This course builds upon the introduction to basic concepts of electricity presented in CET 111. Topics covered include power supplies, reactive electrical components, power distribution, circuit protection, electric motor theory, electric generator theory, types of electric motors, motor starters, switching devices, electrical symbols, pictorial diagrams, schematics, sequences of operation, and basic electrical troubleshooting. The purpose of this course is to prepare students to work safely with low-voltage electrical systems.	3	CET 111
CET 221	Basic Controls         This course is an introduction to control system devices and control concepts that are commonly used to automate building systems and equipment. Topics include controllers, sensors, actuators, controlled devices, power supply devices, transducers, relays & contactors, motor controls, enclosures, and power monitoring devices.         The purpose of this course is to prepare students to work with control devices and wiring used in building automation systems of modern buildings and critical anticipation.	5	CET 101, CET 111 or HVA 1104
	environments.		
CET 222	Building Automation System Controls and ProgrammingThis course builds on electrical and basic control concepts taught in CET 111 and introduces students to controllers that are commonly used in building systems.Students will learn how these controllers communicate with equipment and other controllers, and they will learn how to interpret and write basic programming code in three formats: a graphical interface for block programming, line code, and ladder logic code.The purpose of this course is to prepare students to work with controllers and control systems in buildings, including critical environments, and to troubleshoot problems that might involve programming code.	3	CET 101, CET 111 or HVA 1104
CET 223	<ul> <li>Applied Building System Controls</li> <li>This course builds on topics introduced in CET electrical, controls and programming courses. It examines sequences of operations and related programming for major equipment and devices used in building systems. Students will interact with a commercial air handling unit and air distribution system via application and building automation controllers, learning to adjust setpoints and troubleshoot problems.</li> <li>The purpose of this course is to prepare students to work with controllers and control systems in buildings, including critical environments, and to troubleshoot problems that might involve programming code.</li> </ul>	5	CET 101, CET 111 or HVA 1104, CET 122 or HVA 1044, CET 221, CET 222
CET 241	<ul> <li>Airflow in Commercial and Critical Environments</li> <li>This course builds on topics introduced in HVAC introductory courses. It teaches fundamental concepts regarding airflow, testing and balancing, including the effects of fume hoods and biosafety cabinets in laboratories and other critical environments.</li> <li>The purpose of this course is to prepare students to work on HVAC airflow systems in commercial and critical environments, including airflow through biosafety cabinet and fume hoods, and testing and balancing techniques.</li> </ul>	3	CET 101, CET 111 or HVA 1104, CET 122 or HVA 1044, CET 221

CET 231	<b>Building Automation Networking and BACnet</b> This course builds on CRT 165 and introduces students to the features and benefits of open protocols that are commonly used in building automation	2	CRT 165
	systems, including critical environments. Special emphasis will be given to the BACnet protocol, which is commonly used to integrate control devices into a common building automation networks. Students will learn about the BACnet Standard Object model, token passing and internetworking, alarming, scheduling and trending.		
	The purpose of this course is to prepare students interested in Building Automation Systems to communicate with IT experts, to connect controllers and devices, and to troubleshoot communication problems. It also offers introductory controls information for students in IT fields who are interested in how IT is used in building automation systems.		
CET 299	CET Capstone Project This course will teach students project management skills, which they will use to complete a project that relies upon knowledge and skills from the required CET Program courses. Students will work with either a CET Program faculty member or a supervisor at a partnering business to define a project scope, budget, and timeline. The student will then complete the project and report on the results to an audience that includes a panel of faculty and business colleagues. The purpose of this course is to provide the student project management skills specific to building automations and critical environments.	3	CET 101, BIO 230, CET 111 or HVA 1104, CET 122 or HVA 1044, CRT 165, CET 211, CET 221, CET 222, CET 223, CET 231
BUIS 195	Rusiness Ethics and Human Polations		
503 183	This course introduces contemporary and controversial ethical issues facing the business community. Topics include moral reasoning, moral dilemmas, law and morality, equity, justice and fairness, ethical standards, and moral development. The course emphasizes employability skills such as communication, work habits and attitudes, ethics, conflict management, motivation and problem solving, self- concept, perception, self-awareness, personality, values and communications.	3	None
BUS 255	<b>Principles of Management</b> The course teaches the basic components of management: planning, organizing, leading, and controlling. This course will focus on the fundamentals of management as they are practiced today.	3	None
CIS 116	Spreadsheet Management	[	
	This course covers intermediate-level concepts of spreadsheet software. Using typical business scenarios, the student will perform "what-if" analyses, manage data in worksheets with tables and database functions, and use multiple worksheets to build consolidated statements. The applications and principles learned in this course are relevant to any career field.	2	None
CIS 126	Database Management Database management includes designing and creating a database; adding, changing and deleting records: creating forms and reports, including custom forms	2	None
	and reports; changing structures; building relationships and lookup fields; using query wizards and advanced query techniques; macros.		

COM 105	English Composition I		
	English Composition I is an introduction to expository writing emphasizing expression of ideas, structure, organization, development, and grammatical correctness. The course offers practice in researching, revising, and editing.	3	None
COM 110	Technical Writing		
	This course is an introduction to professional and technical writing used in the workplace. The class offers practice in document design and editing. The types of correspondence include memos, letters, e-mail, reports, and instructional manuals. The course will focus on clarity, conciseness, document design, organization, audience recognition, audience involvement, and accuracy. Collaboration and teamwork is stressed. Presentations will be practiced during class.	3	None
CRT 100	<b>Principles of Information Assurance</b> Principles of Information Assurance is designed to teach the principles and practices that all computer users need to keep themselves safe, both at work and at home. By presenting best practices along with a small amount of theory, students are taught both what to do and why to do it. Topics covered include how to secure both clean and corrupted systems, protecting your personal data, securing simple computer networks, and safe Internet usage.	1	None
CRT 126	Advanced Operating Systems & PC Hardware		
	This course covers personal computer operating systems and hardware to enforce skills related to the CompTIA A+ certification exam. Operating system topics include installation, management, functionality, security, configuration, and virtualization, which are covered primarily within Microsoft Windows. Hardware topics cover CPUs, memory, motherboards, storage and I/O devices, power supplies, home networking, and computer safety.	5	None
HVA 1044	HVAC Fundamentals (or CET 111)		
	This course in refrigeration is designed to include how mechanical refrigerators operate, heat and flow, temperature measurement, pressure, and states of matter, as well as the laws of refrigeration. Safety procedures will also be taught.	4	None
MAT 109	Technical Mathematics II		
	This is an algebra based mathematics course that focuses on technical applications. Topics include graphing linear equations, systems of linear equations, polynomials, factoring polynomials, quadratic equations, right triangle trigonometry and trigonometry with any angle. This course is designed to provide students with the critical thinking needed for solving complex technical problems.	3	None
MAT 110	Intermediate Algebra		
	This course is designed for students who have only one year of high school algebra, are inadequately prepared for College Algebra, or score in the prescribed range on the ASSET/COMPASS exams. Topics covered will include Number Systems, Linear Equations and Inequalities, Lines, Systems of Linear Equations and Inequalities, Polynomials, Exponents, Rational Expressions and Quadratic Equations.	3	None

### **Multiple Options**

Students entering the CET Program will have two option, either an A.A.S. degree in Critical Environment Technologies or a Certificate B in Critical Environment Technologies. Semester-by-semester detail is provided below. The following points regard uniqueness of each alternative

- Courses required by the A.A.S. degree but not required for the Certificate B are as follows:
  - CET 223 Applied Building System Controls (5 SCH)
  - CET 231 Building Automation Networking and BACnet (2 SCH)
  - o CET 241 Airflow in Commercial and Critical Environments (3 SCH)
  - More General Education (an additional 9 SCH)
  - Technical Electives (5 SCH)
- All courses required for the Certificate B are also required for the A.A.S. degree.

### **Program of Study** A.A.S. Degree in Critical Environment Technologies

**62 Credit Hours** 

- **42** Technical Specialty Credits
- **15 General Education Credits**
- **5** Technical Elective Credits

#### Year 1 Fall Semester

Course #	Course Title	SCH
COM 105 or 110	English Composition I or Technical Writing	3
MAT 110 or 109	Intermediate Algebra or Technical Mathematics II	3
BIO 230	Biohazards Risk Reduction	2
CET 101	OSHA 30 General Industry (CET)	2
CET 111	AC/DC Circuits I	4
CET 124	Building Systems & CET: Plumbing & Waste Neutralization	2

#### Year 1 Spring Semester

Course #	Course Title	SCH
CET 122	Building Systems & CET: HVAC	2
CET 211	AC/DC Circuits II	3
CET 221	Basic Controls	5
CRT 165	Modern Information Technology Networks	3
GEN	General Education Elective	3

#### Year 2 Fall Semester

Course #	Course Title	SCH
CET 121	Building Systems & CET: Electrical and Lighting	2
CET 222	Building Automation System Controls and Programming	3
CET 223	Applied Building System Controls	5
CET 231	Building Automation Networking and BACnet	2
TECH	Technical Elective	3

#### Year 2 Spring Semester

Course #	Course Title	SCH
CET 123	Building Systems & CET: Security	1
CET 241	Airflow in Commercial and Critical Environments	3
CET 299	CET Capstone Project	3
GEN	General Elective	6
TECH	Technical Elective	2

#### **Suggested Technical Electives**

#### **5 Credit Hours Course Title** Course # Hrs BUS 255 Principles of Management 3 BUS 185 **Business Ethics and Human Relations** 3 Spreadsheet Management CIS 116 2 **Database Management** CIS 126 2 Principles of Information Assurance CRT 100 1 CRT 126 Advanced Operating Systems & PC Hardware 5 HVA 1044 **HVAC** Fundamentals 4

### **Certificate B in Critical Environment Technologies**

#### **38 Credit Hours**

32 Technical Specialty Credits

**6** General Education Credits

#### Year 1 Fall Semester

Course #	Course Title	SCH
COM 105 or 110	English Composition I or Technical Writing	3
MAT 110 or 109	Intermediate Algebra or Technical Mathematics II	3
BIO 230	Biohazards Risk Reduction	2
CET 101	OSHA 30 General Industry (CET)	2
CET 111	AC/DC Circuits I	4
CET 124	Building Systems & CET: Plumbing & Waste Neutralization	2

#### Year 1 Spring Semester

Course #	Course Title	SCH
CET 122	Building Systems & CET: HVAC	2
CET 211	AC/DC Circuits II	3
CET 221	Basic Controls	5
CRT 165	Modern Information Technology Networks	3
CET 123	Building Systems & CET: Security	1

#### Year 2 Fall Semester

Course #	Course Title	SCH
CET 121	Building Systems & CET: Electrical and Lighting	2
CET 222	Building Automation System Controls and Programming	3
CET 299	CET Capstone Project	3

Note: Should the program be approved, we anticipate offering the A.A.S. degree and Certificate B in the Fall of 2020.

### Accreditation

At this time, there are no third-party credentialing opportunities for students nor are there any outside accrediting agencies for programs such as this. Standards have not been developed that lead to a certification of academic credentials for technicians in critical environment technologies. A long-term goal for MATC is to work with federal agencies and industry to develop an accreditation program for Critical Environment Technologies. MATC's proximity and good relationships with facilities personnel at the National Bio- and Agro Defense Facility (a BSL-4 Lab), USDA APHIS, Biosecurity Research Institute (a BSL-3 lab), the Department of Energy, National Institute of Building Sciences (NIBS), and industry within the Animal Health Corridor, positions us well to develop such a program.

### Faculty

• Describe faculty qualifications and/or certifications required to teach in the proposed program.

Credentials for teaching in the CET Program are the same as for those who are employed for any position as a faculty member, including education, training, and/or industry experience in the topic areas taught. The instructor will hold a degree one level higher than the program degree when possible, or be willing to obtain said degree within a prescribed time period. Instructor must possess or be eligible to obtain certification commensurate with those required by the industry to perform duties at or above the level taught within the program. (See attached Job Description Appendix D)

### **Cost and Funding for Proposed Program**

- Provide a detailed budget narrative that describes all costs associated with the proposed program (physical facilities, equipment, faculty, instructional materials, accreditation, etc.).
- Provide detail on CA-1a form.
- Describe any grants or outside funding sources that will be used for the initial startup of the new program and to sustain the proposed program.

### **Budget Narrative**

MATC is prepared to support the new CET Program in the following areas:

- <u>Advising services</u>. 1 admissions director, 1 vice president of student services, 1 counselor, 2 student services assistants will be available for CET Program advising.
- <u>Laboratory and Instructional Space</u>. MATC has used general funds and current facilities staff to remodel space to serve as the CET Automation Lab.
- <u>Instructional Equipment and Supplies</u>. MATC was awarded a 3-year NSF ATE grant in 2018 (\$511,599), allowing the college to purchase of equipment to build a new Building Automation Systems and CET laboratory. Further, local industry has donated equipment and supplies, and have expressed a desire to donate more supplies for ongoing needs. MATC's Foundation provided funds to hire an expert in Building Automation Systems to help design and equip the lab.
- <u>Library</u>. Students have access to MATC's library that has access to several resource databases as well as Kansas State University's library. Through a data management system at MATC, students are able to access library resources via the Internet from wherever they are located.

### CA-1a Form

The funding required on the CA-1a is the funding that is required to offer the CET Program specific courses. See the detailed form Appendix E.

### CA-1b Form

Please see Appendix F to request inclusion of courses for Excel in CTE funding.

### CA-1c Form

Please see Appendix G to determine Carl D. Perkins grant funding eligibility.

### Grants and Outside Funding Sources for Startup and Sustainability

- <u>NSF ATE Award</u>. MATC was awarded a \$511,599 grant from the National Science Foundation through their Advanced Technological Education (ATE) program. The grant funds CET program development costs for three years, starting in July 2018, including funding for program staff, consultants, and equipment. In addition to providing funding, the NSF provides numerous resources, training opportunities, and networking and sharing venues for grant awardees.
- <u>MATC Foundation</u>. The MATC Foundation is supporting the start-up of the CET Program by funding consultation services of Brian Lovell of the Association of Controls Professionals to design and start building the building automations portion of the CET Automation laboratory.

### **Program Review and Assessment**

• Describe the institution's program review cycle.

Faculty and administration review the effectiveness of individual instructional programs on a three-year rotational basis. Such review may lead to recommendations for modifications of practice, changes in content and courses, and expansion or discontinuance of the program of instruction. Areas of the program that are reviewed specifically include mission, objectives of the program, and learning outcomes; relevance of curriculum; faculty credentials; budgetary requirements of the program; enrollment, graduation, and placement data, including wages; and any other items that are unique to the program being reviewed. New programs are reviewed annually in a modified form and three years after the initial introduction of the program. Additionally, during the duration of the NSF ATE grant, surveys are being sent to industry, partners, and students regarding the quality of the program and courses.

See Appendix H for the Program Review document. The program is under the direction of the Program Director of Critical Environment Technologies. The program faculty will complete the program review and then present results to the BILT and Vice President of Student Success.

**Rationale:** The on-going review of programs of study assists the College in meeting its mission by:

- 1. Determining the manner in which individual programs support the mission of the College;
- 2. Demonstrating program accountability to students, stakeholders, and funding sources, such as the State of Kansas;
- 3. Indicating where improvements could be undertaken within programs related to curricular and program changes based on data-driven decision-making;
- 4. Assisting programs in preparing to secure and/or renew individual program accreditation from national/state/regional accrediting agencies;
- 5. Enhancing awareness of individual programs, increasing visibility, and providing information for promotional efforts related to program enrollment;
- 6. Encouraging celebration of program success;
- 7. Providing foundation for program interaction with Board of Directors; and
- 8. Allowing College to meet the HLC requirement for on-going program review.

### **Program Approval at the Institution Level**

- Provide copies of the minutes at which the new program was approved from the following groups:
  - **Program Advisory Committee** (including a list of the business and industry members)
  - o Curriculum Committee
  - Governing Board (including a list of all Board members and indicate those in attendance at the approval meeting)

<u>Program Advisory Committee</u>. The CET Program at MATC adopted the term Business and Industry Leadership Team (BILT) to describe its PAC, based on NSF suggestions for emphasizing a leadership role versus simply advisory. A list of BILT members who have participated in update and planning meetings and/or other support is attached in the Appendix. The minutes of the meeting at the full curriculum was approved by the BILT on December 13, 2019 are in Appendix I.

<u>MATC Curriculum Committee</u>. The MATC Curriculum Committee approved the course outlines for all new CET Courses at two meetings: February 15, 2019 & October 18, 2019. The committee approved the program at the meeting on February 7, 2020. Minutes provided in Appendix J.

<u>MATC Board Members</u>. The MATC governing board approved the curriculum and new program at the meeting on February 25, 2020. Minutes provided in Appendix K.

Submit the completed application and supporting documents to the following: Director of Workforce Development Kansas Board of Regents 1000 SW Jackson St., Suite 520 Topeka, Kansas 66612-1368

## **APPENDIX**

### **APPENDIX A**

### Competencies

### General Work Skill Competencies

		Math (Algebra or	Communications (electronic, oral,	Organization Skills	Time Management	Critical Thinking	Professional Demeanor	Safety Awareness
		above)	written)					& Behavior
CET 101	OSHA 30 General Industry (CET)					Х	X	Х
BIO 230	Biohazards Risk Reduction					х	Х	Х
CET 111	AC/DC Circuits I	Х		Х	Х	х	Х	Х
CET 123	Building Systems & CET: Security			Х	Х	Х	Х	Х
CET 124	Building Systems & CET: Plumbing & Waste Neutralization			X	Х	Х	X	X
CRT 165	Modern Information Technology Networks			Х	Х	Х	Х	Х
CET 211	AC/DC Circuits II	Х		Х	Х	Х	Х	Х
CET 221	Basic Controls	Х		Х	Х	Х	Х	Х
CET 121	Building Systems & CET: Electrical and Lighting			X	Х	х	X	x
CET 122	Building Systems & CET: HVAC			Х	Х	Х	Х	Х
CET 222	Building Automation System Controls and Programming			X	Х	х	X	x
CET 223	Applied Building System Controls	Х		Х	Х	Х	Х	Х
CET 231	Building Automation Networking and BACnet	x		X	Х	Х	Х	x
CET 241	Airflow in Commercial and Critical Environments	x		X	Х	Х	X	x
CET 299	CET Capstone Project	Х	Х	Х	Х	Х	Х	Х
BUS 185	Business Ethics and Human Relations		Х	Х	Х	Х	Х	
BUS 255	Principles of Management		Х	Х	Х	Х	Х	
CIS 116	Spreadsheet Management	Х		Х	Х	Х		
CIS 126	Database Management	Х		Х	Х	Х		
COM 110	Technical Writing		Х	Х	Х	Х		
CRT 100	Principles of Information Assurance			Х	Х	Х		
CRT 126	Advanced Operating Systems & PC Hardware			X	Х	Х		
HVA 1044	HVAC Fundamentals (or CET 111)	Х		Х	Х	Х	Х	Х

HVA 1104	Electrical Fundamentals	х	х	Х	х	х	Х
MAT 109	Technical Mathematics II	Х	Х	Х	Х		
MAT 110	Intermediate Algebra	Х	Х	Х	Х		

### **Building System Competencies**

		Electrical	HVAC	Plumbing/ Waste Neutralization	Security	Critical Environment	Automation	ІТ
						Considerations		
CET 101	OSHA 30 General Industry (CET)	Х				Х		
BIO 230	Biohazards Risk Reduction		Х			Х		
CET 111	AC/DC Circuits I	Х				Х	Х	
CET 123	Building Systems & CET: Security				Х	Х	Х	
CET 124	Building Systems & CET: Plumbing & Waste Neutralization			X		Х	x	
CRT 165	Modern Information Technology Networks	Х				Х	Х	Х
CET 211	AC/DC Circuits II	Х				Х	Х	
CET 221	Basic Controls	Х	Х	Х	Х	Х	Х	Х
CET 121	Building Systems & CET: Electrical and Lighting	X				Х	Х	
CET 122	Building Systems & CET: HVAC					Х	Х	
CET 222	Building Automation System Controls and Programming		Х			Х	x	
CET 223	Applied Building System Controls		Х			Х	Х	Х
CET 231	Building Automation Networking and BACnet					Х	x	х
CET 241	Airflow in Commercial and Critical Environments		Х			Х	х	
CET 299	CET Capstone Project					Х	Х	
BUS 185	Business Ethics and Human Relations							
BUS 255	Principles of Management							
CIS 116	Spreadsheet Management							
CIS 126	Database Management							
COM 110	Technical Writing							
CRT 100	Principles of Information Assurance							
CRT 126	Advanced Operating Systems & PC Hardware							
HVA 1044	HVAC Fundamentals (or CET 111)	Х	Х					
HVA 1104	Electrical Fundamentals	Х	Х					
MAT 109	Technical Mathematics II							
MAT 110	Intermediate Algebra							

### Automation Competencies

		Circuit	Wiring	Programming	Troubleshooting	System	Automation	Scheduling
CET 101	OSHA 30 General Industry (CET)	Analysis				integration	Strategy	
BIO 230	Biohazards Risk Reduction							
CFT 111	AC/DC Circuits I	x	x	X	x	x		
CFT 123	Building Systems & CET: Security		~		~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	x	
CFT 124	Building Systems & CET: Plumbing & Waste						X	
	Neutralization							
CRT 165	Modern Information Technology Networks		Х					
CET 211	AC/DC Circuits II	X	Х		Х			
CET 221	Basic Controls	X	Х	Х	Х		Х	
CET 121	Building Systems & CET: Electrical and Lighting		Х			Х	Х	
CET 122	Building Systems & CET: HVAC					Х	Х	
CET 222	Building Automation System Controls and	Х			Х	Х	Х	Х
	Programming							
CET 223	Applied Building System Controls	X	Х		Х	Х	Х	
CET 231	Building Automation Networking and BACnet	Х	Х		Х	Х	Х	
CET 241	Airflow in Commercial and Critical				Х		Х	
	Environments							
CET 299	CET Capstone Project	Х	Х	Х	Х	Х	Х	Х
BUS 185	Business Ethics and Human Relations							
BUS 255	Principles of Management							
CIS 116	Spreadsheet Management							
CIS 126	Database Management							
COM 110	Technical Writing							
CRT 100	Principles of Information Assurance							
CRT 126	Advanced Operating Systems & PC Hardware							
HVA 1044	HVAC Fundamentals (or CET 111)							
HVA 1104	Electrical Fundamentals							
MAT 109	Technical Mathematics II							
MAT 110	Intermediate Algebra							

### **APPENDIX B**

### KDOL Long-Term Occupational Outlook

for Positions in which CET Program Graduates Could Work

Note: No State or Federal labor data are found for technicians specializing in Critical Environment Technologies

Occupational Title	Jobs: 2016	Projected Jobs: 2026	Projected Rise (%)	Job Openings: Annual	Exits: Annual	Annual Median Wage	Typical Education Needed for Entry
Computer Network Support Specialists	890	903	1.46%	65	18	\$ 56,386	Associate's degree
Electrical and Electronics Drafters	***	***	***	***	***	\$ 41,416	Associate's degree
Electrical and Electronics Engineering Technicians	958	993	3.65%	86	31	\$ 60,975	Associate's degree
Electro-Mechanical Technicians	***	***	***	***	***	***	Associate's degree
Engineering Technicians, Except Drafters, All Other	***	***	***	***	***	\$ 56,205	Associate's degree
HelpersElectricians	474	497	4.85%	69	20	\$ 30,470	High school diploma or equivalent
Electrical and Electronic Equipment Mechanics, Installers, and Repairers	5518	4764	-13.66%	413	153	\$ 49,451	ND
Electrical and Electronics Repairers, Commercial and Industrial Equipment	473	457	-3.38%	38	12	\$ 51,809	Postsecondary non- degree award
Security and Fire Alarm Systems Installers	386	429	11.14%	47	13	\$ 53,746	High school diploma or equivalent
Control and Valve Installers and Repairers, Except Mechanical Door	412	425	3.16%	32	10	\$ 61,986	High school diploma or equivalent
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	2411	2656	10.16%	264	70	\$ 46,596	Postsecondary non- degree award

### **APPENDIX C - Letters of Support**

(see following pages)

30 W. Pershing Road Suite 200 Kansas City, MO 64108 816.221.2121 fax : 816.842.2865 kcadc@thinkKC.com





December 11, 2019

Dr. Jim Genandt, President/CEO Manhattan Area Technical College 3136 Dickens Avenue Manhattan, KS 66503

Dear President Jim,

On behalf of the KC Animal Health Corridor, we are providing this letter endorsing and supporting the proposed program in Critical Environment Technology (CET) through Manhattan Area Technology College (MATC).

You and your staff have kept us informed and involved in the process of developing the courses and learning objectives of this unique program. The blend of basic technological competencies in areas such as HVAC, networking, building systems, construction science, safety/biosafety, and how to work in a high containment environment in support of NBAF are critically important. The NBAF lab in Manhattan and the economic impact of the KC Animal Health Corridor together are sufficient demonstration of need for this program. At the same time, many of the program components apply to other business and industry operations throughout the region.

Thank you for developing this program of study that addresses current and emerging needs in the high containment/clean environment industry.

Sincerely,

Kimberly Young President KC Animal Health Corridor young@thinkKC.com



Dr. Jim Genandt, President/CEO Manhattan Area Technical College 3136 Dickens Avenue Manhattan, KS 66503

Dear President Jim,

On behalf of KBS Constructors, Inc. we are providing this letter endorsing and supporting the proposed program in Critical Environment Technology through MATC.

You and your staff have kept us informed and involved in the process of developing the courses and learning objectives of this unique program. The blend of basic technological competencies in areas such as HVAC, networking, building systems, construction science, safety/biosafety, and how to work in a high containment environment in support of that particular facility. The NBAF Lab in Manhattan and the economic impact of the KC Animal Health Corridor together are sufficient demonstration of need for this program. At the same time, many of the program components apply to other business and industry operations throughout the region.

In our industry, the earning potential for employees working in the facility operations and engineering areas ranges from \$40,000 / year to \$65,000 / year. We can also anticipate job openings/turnover to range from 2 to 6 per year. We believe that 4 employees/potential employees could benefit from this program each year.

We are also demonstrating our support for the program by agreeing to:

\_X\_ Have an appropriate company representative serve on the CET advisory committee (Business Industry Leadership Team at MATC).

\_X\_ Continue to provide technical assistance to the program related to learning outcomes and affirming industry expectations.

\_X\_ Provide support through donations and/or in-kind contributions to the MATC Foundation (i.e., supplies, equipment).

\_X\_ Discuss with program staff about options for job shadowing, mentoring, internships, capstone projects, apprenticeships, continued professional development for employees, etc.

\_X\_ Provide opportunities for program and/or college staff to share marketing material, program enrollment/training options, opportunities for instruction or facilitating learning experiences, etc.

Thank you for developing this program of study that addresses current and emerging needs in the high containment/clean environment industry.

Sincerely,

Steve Spade, Business Development KBS Constructors, Inc. Topeka, KS



1200 Kretschmer Drive Manhattan, KS 66502 P 785.320.7021 24-HOUR SERVICE 785.320.7016 usengineering.com

April 3, 2020

Dr. Jim Genandt, President/CEO Manhattan Area Technical College 3136 Dickens Avenue Manhattan, KS 66503

Dear President Jim,

On behalf of U.S. Engineering Service we are providing this letter endorsing and supporting the proposed program in Critical Environment Technology through MATC.

You and your staff have kept us informed and involved in the process of developing the courses and learning objectives of this unique program. The blend of basic technological competencies in areas such as HVAC, networking, building systems, construction science, safety/biosafety, and how to work in a high containment environment in support of that particular facility. The NBAF Lab in Manhattan and the economic impact of the KC Animal Health Corridor together are sufficient demonstration of need for this program. At the same time, many of the program components apply to other business and industry operations throughout the region.

In our industry, the earning potential for employees working in the facility operations, engineering and service areas ranges from \$36,000 to \$82,000 or more with full benefits. In the Flint Hills Region alone I would anticipate job openings/turnover in this industry in excess of 200 – 300 skilled workers per year. We believe that all of these employees/potential employees could benefit from this program.

We are also demonstrating our support for the program by agreeing to:

Have an appropriate company representative serve on the CET advisory committee (Business Industry Leadership Team at MATC).

Continue to provide technical assistance to the program related to learning outcomes and affirming industry expectations.

Provide support through donations and/or in-kind contributions to the MATC Foundation (i.e., supplies, equipment).

Discuss with program staff about options for job shadowing, mentoring, internships, capstone projects, apprenticeships, continued professional development for employees, etc.

Provide opportunities for program and/or college staff to share marketing material, program enrollment/training options, opportunities for instruction or facilitating learning experiences, etc.

Thank you for developing this program of study that addresses current and emerging needs in the high containment/clean environment industry.

Please feel free to contact me with any questions, or if you wish to discuss this matter in greater detail, at (785) 320-6669 or by email to <u>Richard.Jones@USEngineering.com</u>.

Sincerely,

U.S. ENGINEERING SERVICE

Richard Jones Jr. General Manager Flint Hills Region

Dr. Jim Genandt, President/CEO Manhattan Area Technical College 3136 Dickens Avenue Manhattan, KS 66503

Dear President Jim,

On behalf of Five Star Mechanical we are providing this letter endorsing and supporting the proposed program in Critical Environment Technology through MATC.

You and your staff have kept us informed and involved in the process of developing the courses and learning objectives of this unique program. The blend of basic technological competencies in areas such as HVAC, networking, building systems, construction science, safety/biosafety, and how to work in a high containment environment in support of that particular facility. The NBAF Lab in Manhattan and the economic impact of the KC Animal Health Corridor together are sufficient demonstration of need for this program. At the same time, many of the program components apply to other business and industry operations throughout the region.

In our industry, the earning potential for employees working in the facility operations and engineering areas ranges from \$40,000 to \$85,000 annually. We can also anticipate job openings/turnover to range from 1 to 5 per year. We believe that 5 employees/potential employees could benefit from this program each year.

We are also demonstrating our support for the program by agreeing to:

<u>Have an appropriate company representative serve on the CET advisory committee</u> (Business Industry Leadership Team at MATC).

<u>X</u> Continue to provide technical assistance to the program related to learning outcomes and affirming industry expectations.

X Provide support through donations and/or in-kind contributions to the MATC Foundation (i.e., supplies, equipment).

<u>X</u> Discuss with program staff about options for job shadowing, mentoring, internships, capstone projects, apprenticeships, continued professional development for employees, etc.

<u>X</u> Provide opportunities for program and/or college staff to share marketing material, program enrollment/training options, opportunities for instruction or facilitating learning experiences, etc.

Thank you for developing this program of study that addresses current and emerging needs in the high containment/clean environment industry.

Sincerely, Todd Helmut Five Star Mechanical Inc. Controls Department Manager



Vice President for Research

September 29, 2017

Dr. James D. Genandt President, Manhattan Area Technical College Manhattan, KS 66503

Dear President Genandt,

I am pleased to share provide this letter indicating that the Vice President for Research and the Provost of Kansas State University both support the efforts of Manhattan Area Technical College to develop and launch its Critical Environment Technology program. The University's commitment to be a global leader in food science, and our role in assisting the Animal Health Corridor along I-70 also means we realize and support the work of Manhattan Area Technical College to provide critical workforce training related to biotechnology, biosafety, and critical environment technology. Manhattan Area Technical College works with the University to enhance the capacity of both institutions to plan for and meet the skilled worker need and economic development options along the Animal Health Corridor and beyond. We will continue to collaborate on training and education opportunities to support optimal talent acquisition for this region.

Sincerely,

Dr. Peter K. Dorhout Vice President for Research

april C Mason

Dr. April Mason Provost and Senior Vice President

### **APPENDIX D**

### **Job Description**

Job Description: Critical Environment Technology Instructor

Job Classification: Exempt Work Schedule: Varies based on Employment Terms Compensation: As Stated in the Offer Letter Reporting Relationship: Vice President of Student Success

### **Primary Accountabilities:**

The Critical Environment Technology Instructor(s) will provide instruction for courses within the Critical Environment Technology program that are specific to their area of expertise, which may include electrical, automation, HVAC, plumbing, security, information technology, workplace safety, and biosafety in laboratories. Faculty provide course instruction in a manner that ensures student comprehension, retention of knowledge, and positive effective student engagement. In collaboration with other Manhattan Area Technical College ("MATC") faculty and instructional staff, to ensure this position demonstrates an understanding of course content in its specified discipline, adopts appropriate instructional methods, and possesses pedagogical insight that includes robust instruction and communication practices. Teaching assignments may vary depending on the specific qualifications and expertise of the individual.

### Major Duties:

- Demonstrates a thorough and accurate knowledge of the field or discipline and displays an ability to interpret and evaluate theories.
- Connects subject matter with related fields and remains current in subject matter.
- Maintains current certifications as appropriate.
- Provides students with a complete syllabus containing course outcomes and competencies.
- Adheres to current approved departmental course outlines.
- Plans and organizes instruction in ways that maximize student learning.
- Employs appropriate teaching and learning strategies, including appropriate technology when available.
- Presents enthusiastic, well-prepared, organized, and clear lectures and classroom activities consistent with the course syllabus.
- Modifies, where appropriate, instructional methods and strategies to meet diverse student needs.
- Encourages the development of communication skills and higher order thinking skills through appropriate assignments; promotes the development and effective use of skills in areas such as critical and analytical thinking, evaluation, communication, computation, problem solving, and decision-making.
- Communicates subject matter to students within a positive learning and teaching atmosphere.
- Teaches ethical work practices.
- Possesses a thorough knowledge and understanding of all MATC policies and maintains student discipline within policies and procedures.
- Effectively uses technology tools including, but not limited to, MATC Online, e-mail, MS Office, Internet.
- Develops evaluation methods that effectively measures student progress toward objectives.

- Evaluates and utilizes student work to promote maximum learning.
- Provides the student with timely information and feedback on his/her academic progress relative to quizzes, tests, homework, and projects.
- Maintains accurate and up-to-date records of student academic performance and progress.
- Ensures courses meet current standards and are scheduled in accordance with MATC policy.
- Prepares, distributes, and submits syllabi based on current approved department course outlines for all assigned sections in accordance with college policies.
- Maintains confidentiality of student information.
- Exercises stewardship of MATC facilities and materials.
- Assists in curriculum development and textbook review/selection.
- Assists in maintaining all lab equipment and leaves classrooms in a neat and orderly fashion.
- Maintains accurate grades, attendance, and other required paperwork.
- Attends meetings and events as required by MATC administration.
- Responds in a timely fashion to information requests and required reports from college and program administrators (e.g. last date of attendance report, rosters, grades, assessment data, all state/vocational reporting requests).
- Supports both adjunct and full-time colleagues.
- Documents and request needed supplies through appropriate procedures.
- Allows students to complete surveys when requested in a timely manner.
- Participates in lesson plan review and documentation.
- Performs all other duties as assigned.

### Qualifications:

- For general education courses, Master's degree with at least eighteen (18) graduate credit hours of discipline-specific course work is required.
- For technical courses, other factors encompassing education, certifications, and work experience will be considered
- Two (2) years of post-secondary teaching experience preferred; extensive training experience in industry will be considered in lieu of teaching experience
- Strong computer and word processing skills.
- Experience in working with a Learning Management System preferred.
- Strong interpersonal skills, including public speaking and ability to present MATC in a positive way.
- Ability to communicate clearly and professionally through both verbal and written skills.
- Ability to interact effectively and professionally with students, staff, and faculty.
- Display a student-centered approach.
- Willingness to reinforce all lecture lessons with hands-on experiences when resources permit.
- Willingness to expand program to meet regional needs.
- Consistently demonstrate the highest levels of integrity and professionalism.
- Demonstrated poise, tact and diplomacy with the ability to handle sensitive and confidential information and situations.

### **Physical Demands**:

- Ability to sit for extended periods of time.
- Ability to read computer screens and mail, email, and talk on the phone.
- Ability to unpack and move supplies up to fifty (50) lbs.

• Ability to work occasional evenings and attend events as required.

### Work Environment:

- Professional and deadline-oriented environment in an educational setting.
- Interaction with students, staff and guests.

### NOTICE OF SPECIAL POSITION OF EMPLOYMENT REQUIREMENTS

- This position description is not designed to cover or contain a comprehensive list of all duties and results to be performed in this position. Duties and Performance standards may be added, subtracted, and/or changed by your supervisor at any time due to changes in department or institutional requirements.
- 2. Unless exempt due to employment contract signed by the President, all employees of Manhattan Tech are to be considered as an "at-will" employee.
- All employees of Manhattan Tech are considered "responsible employees" pertaining to Title IX regulations concerning both prevention and reporting of sexual assault or harassment situations. As such, all employees must communicate with the Title IX Coordinator if they witness or hear about sexual assault or harassment situations.
- 4. Manhattan Tech is an equal opportunity employer and complies with EEOC and ADA employment requirements. Manhattan Tech grants equal opportunity to all qualified persons without unlawful discrimination based on race, color, gender, age, national origin, ancestry, ethnicity, disability, sexual orientation, religion or veteran status.
- 5. All 'offers of employment" are subject to criminal background check prior to employment.

Employee Signature

Date

Supervisor Signature

Date

### **APPENDIX E**

Revised/Approved January 2018

### KBOR Fiscal Summary for Proposed Academic Programs CA-1a Form (2018)

Institution: Proposed Program:

Manhattan Area Technical College A.A.S. Critical Environment Technologies

### **IMPLEMENTATION COSTS**

Part I. Anticipated Enrollment	Implementation Year					
Please state how many students/credit hours are expected durin	ng the initial	year of the program	?			
		Full-Time	;		Part-Time	
A. Headcount:		15/32 crh			0	
Part II. Initial Budget			Impler	mentation	Year	
Faculty		Existing:	New:		Funding Source:	
Full-time (Coordinator)	1		\$40,0	00	NSF Grant	
Part-time/Adjunct	3-4		\$12,650		MATC General	
		Amount		Funding	Source	
A. Equipment required for program		\$ 20,000		NSF Grar	nt/ Donations	
B. Tools and/or supplies required for the program		\$4,000		NSF Grar	NSF Grant/ Donations	
C. Instructional Supplies and Materials		\$9,000		NSF Grant/Student Fees/ Donations		
<ul> <li>D. Facility requirements, including facility modifications and/or classroom renovations</li> </ul>		\$5,000		MATC Ge	MATC General/ Donations	
E. Technology and/or Software		\$2,000		NSF Grant/ Donations		
F. Other (Please identify; add lines as required)						
Total For Implementation Year		\$92	2,650			
PROGRAM SUSTAINABI	ITY COST	S (Second and Th	ird Ves	are)		

PROGRAM SUSTAINABILITY COSTS (Second and Third Years)

Part I. Program Enrollment		Second and Third Years				
Please state how many students/credit hours are expected	during the first	two years of the prog	gram?			
		Full-Tim	e		Part-Time	
A. Headcount:		15/32crh & 15	/30 crh		0	
Part II. Ongoing Program Costs			Firs	t Two Ye	ears	
Faculty		Existing:	New:		Funding Source:	
Full-time	1	\$70,000	0,000		NSF Grant / MATC General	
Part-time 3-4		\$25,300	\$		MATC General	
		A	mount	Funding	Source	
A. Equipment required for program		\$10,000		NSF/ Donations		
B. Tools and/or supplies required for the program		S	\$1,000		NSF/ Donations	
C. Instructional Supplies and Materials		\$1	\$18,000		Fees/ Donations	
D. Facility requirements, including facility modifications and/or classroom renovations		S	\$2,000	MATC G	eneral/ Donations	
E. Technology and/or Software		5	\$2,000	NSF/ Donations		
F. Other (Please identify; add lines as required)						
Total For Program Sustainability		\$12	28,300			

### KBOR Fiscal Summary for Proposed Academic Programs CA-1a Form (2018)

Please indicate any additional support and/or funding for the proposed program:

Local industry has expressed intent to donate equipment, supplies, services and consultation for the program.

### APPENDIX F KBOR Excel in CTE Fee Summary for Proposed Academic Programs

ČA-1b Form (2020)

Per statute (K.S.A. 72-3810), the Kansas Board of Regents shall establish general guidelines for tuition and fee schedules in career technical education courses and programs. The Excel in CTE tuition and fee schedule of every technical education program shall be subject to annual approval. Please include all costs charged to <u>high school students</u> for the proposed new program.

Institution Name:	Manhattan Area Technical College
Program Title:	Critical Environments Technologies (CET)
Program CIP Code:	15.0599

Please list all fees	associated with this <u>program</u> :	
Only list costs the	institution <u>is</u> charging students.	
Fee	Short Description	Amount
	Excel in CTE Students are not charged fees	0.00

Please list all courses with	in the program and any fees associated to those <u>courses</u> :	
Only list costs the institution	on <u>is</u> charging students. Do not duplicate expenses.	
Course ID	Short Description	Amount
CET 101	OSHA30 General Industry (CET)	0.00
CET 121	Building Systems & CET: Electrical and Lighting	0.00
CET 123	Building Systems & CET: Security	0.00
CRT 165	Modern Information Technology Networks	0.00

Please list items the stude	nt will need to purchase on their own for this program:			
Institution <u>is not</u> charging	Institution <b>is not</b> charging students these costs, rather students are expected to have these items for the program.			
		Estimated		
Item	Short Description	Amount		

### Carl D. Perkins Funding Eligibility Request Form

Strengthening Career and Technical Education for the 21st Century Act

CA-1c Form (2020)

Name of Institution	Manhattan Area Technical College
Name, title, phone, and email of person submitting the Perkins Eligibility application (contact person for the approval process)	Sarah Phillips, Vice President Student Success/CAO/CSSO 785.587.2800 sarahphillips@manhattantehch.edu
Name, title, phone, and email of the Perkins Coordinator	Nathan Roberts, Dean of Career & Technical Education 785.320.4589 <u>nathanroberts@manahattantech.edu</u>
Program Name	Critical Environments Technologies (CET)
Program CIP Code	15.0599
Educational award levels <u>and</u> credit hours for the proposed request	Certificate B – 38 SCH AAS Degree – 62 SCH
Percentage of tiered credit hours for the educational level of this request	Certificate B – AAS Degree – 75%
Number of concentrators for the educational level	Brand new program to institution. No concentrators as of this moment.
Does the program meet program alignment?	Not applicable
Justification for conditional approval: (this section must reference information found within the Local Needs Assessment)	Manhattan Region Needs Assessment discusses development of NBAF in the city of Manhattan and it's economic impact. The need for trained technicians is noted within the needs assessment as it alone is estimated to bring 400 jobs to Manhattan. This doesn't include meeting the needs of 300 animal science companies along the Animal Health Corridor.
Signature of College Official	Date 8.5.20
Signature of KBOR Official	Date

### **APPENDIX H**



## **Program Review Report for AY 19-20**

### **Program Review Document**

2018-2019 Financials Revenue	
Tuition (credit hours)	
Program/Course Fees	
Institutional Fees	
State Aid	
Total Revenue	
Grant/External Funding	
Perkins	
Capital Outlay	
Total External Funding	
Expenses	
Teaching Salary & Benefits	
Program/Course Supplies	
Professional Development	
Equipment Purchased	
Other Expenses	
Total Expenses	
Program Contribution to Indirect Costs	
Supplemental Program Informa	tion
MATC Per Credit Hour of Instruction	
(direct costs only)	
Cost Model Composite Rate (average)	
Total Annual Cost to Students – tuition,	
lab rees, textbooks, tools, equipment	

Program Data	AY 18-19	AY 17-18	AY 16-17			
Student Information						
Number Admitted						
(met program requirements)						
Male/Female Mix						
Retention	/Graduati	ion				
1 <sup>st</sup> to 2 <sup>nd</sup> Semester Retention						
Number of Graduates						
A.A.S.						
Certificate						
Semester Credit	Hours Ge	enerated	Γ			
Total Completed Students						
Total SCH (Omit Gen Ed SCH)						
Follow-Up	Informat	ion				
No. of Students Available						
No. of Students Placed <sup>1</sup>						
No. Placed in Field						
Average Wage						
Industry (	Credentia	ls				
Number Attempted						
Number Earned						
Assessments of N	ATC Cor	e Abilities				
Oral Communication						
Written Communication						
Problem Solving/Critical Thinking						
Quantitative Literacy						

<sup>1</sup> Placed means employed, continuing education, or serving in the military.



Program Name	
How does program align with the mission of the college?	
Program Accreditation (Quality – External) (Only for those	Discuss the results of the most recent accreditation and plans for addressing any deficiencies or recommendations. Please identify the next accreditation visit.
programs that are accredited by a third party)	
Instructor Credential(s)	See the following Faculty Credentials page for reporting faculty credentials
(Quality – Input)	Professional development highlights for each faculty including summary of how the activity contributed to overall professional development
Adjunct Faculty	See the following Faculty Credentials for reporting faculty credentials
(Quality – Input)	
Support Student	Student organizations, honor societies, student competitions—evidence that the program
Development	supports and encourages student development including leadership opportunities
(Quality – Input)	
<u>Optional</u>	
Program Advisory	Current members including their title, organization, phone number, email, number of years
Committee / Business	on committee, contributions to the program (guest speaker, donations, internships, etc.)
and Industry	Provide documented evidence of PAC/BILT validating program outcomes and
Involvement	recommendations from the PAC/BILT related to program needs.
(Quality – Input)	
Gifts in Kind or	Name of donor/company
Donations	Specifically what was donated
(Quality – Input)	Value of donation - estimate the value and identify what the college did <u>not</u> have to
	spend for an equivalent purchase.
Certificates and	Certificate(s) – name of certificate and number of credit hours
Degrees Awarded	A.A.S. degree requirements
(Quality – Output)	Discuss the data provided related to number of students in program and retention/completion . Provided an analysis regarding the number of students completing the program within 150% of normal time (A.A.S. degree – 3 years; Certificate – 1.5 years).
	Discuss employment placement evidence: number of students placed into jobs related to the program of study, student/employer feedback on satisfaction of their preparation from



	MATC, longevity/advancement of graduates within their program of study and job placement, number of students who were successful with gaining related employment who did not complete their program of study.
Curriculum Review	Provide a narrative identifying the significant program changes since last program review
(Quality – Output)	
Program Learning	Map course outcomes to program outcomes – provide matrix as an attachment
Outcomes	Map MATC Core Abilities to program/course outcomes
(Quality – Output)	
Course Level	Registrar/IR will provide this data; provide an analysis of the grade distribution
Assessment Results or Grade Distribution	
(Quality – Output)	
Assessment Results	Program and Course
(Quality – Output)	MATC Core Abilities assessment results –
	IR will provide MATC Core Abilities results (Oral Communication, Written Communication, Problem Solving/Critical Thinking, Quantitative Literacy) for the most recent years.
	End-of-program assessment results
	Other external assessment results
	Provide narrative discussing what you learned from the assessment data and how you will use the data to make improvements/changes
Delivery Methods –	Complete this section only if more than one delivery method is used to deliver the classes.
Face-to-Face, Blended,	
(Quality - Qutput)	
Recruiting Retention	Describe the recruiting efforts that you have utilized as well as the efforts that you have
Persistence, and	implemented to affect retention, persistence, and completion of your students.
Completion	
(Quality – Output)	
Job Outlook – Demand for Program	
(Potential Growth and Development)	
Resources Needed	1. To maintain program quality
	2. To advance program quality and value to regional employers

**<u>S.W.O.T. Analysis</u>** – vetted by PAC/BILT and any appropriate external group.



### **Faculty Credentials**

		Deg	ree(s)			
Faculty Member (FT, Adjunct, Online)	Year of Initial Appointment	Туре (A.A.S., B.S., M.S.)	Discipline (Number of 500 level credit hours in field)	Assigned Teaching Discipline	Professional Certifications	Level of Qualification (HLC Standards—see handout)



Strengths Weaknesses Opportunities Threats

Analysis of S.W.O.T.

# BILT Meeting Minutes



13 December 2019 / 12:00 PM / ROOM 104A

### Attendees

MATC: Jim Genandt, Sarah Phillips, Tracy Geisler, Carmela Jacobs, Josh Gfeller, Andrew Caponera, Gina Becker, Gary Maple, Josh Gfeller 5 Star Mechanical: Todd Helmut KBS Constructors: Steve Spade BRI: John Henneman, Margie Juergensmeyer, Eric Montgomery USDA ARS: Chad Austin USDA APHIS: Denise Montgomery, Jeff Hansford, Justin McNutt Kansas Department of Commerce: Trent Armbrust MATC Board of Directors: Dave Fritchen

### Agenda

- Welcome (President Jim Genandt)
  - O Donor Appreciation
  - O Lab Redirection
- CET Curriculum Development
  - O Timeline
  - O Approval Process
  - O Curriculum Feedback/ Approval
  - O Educational Opportunities for 2020
- Lab Equipment/ Support Needs

### Proceedings

### <u>Welcome</u>

- Acting Chair and college President, Jim Genandt called the meeting to order at 12:10 PM.
- Jim Genandt gave an update on MATC rankings, thanked donors, and informed that the MATC's internal Project Team will assume the project management role for the CET Automation Lab. Brian Lovell of Base Endeavors will continue to be involved as a consultant.
- Gary Maple introduced himself, his work history and technical background.

### **CET Curriculum Development**

• Gina Becker gave an overview of the project timeline and curriculum approval process, highlighting points from the curriculum packet that was sent to BILT members on 12/5/19.

- Jim Genandt opened the floor for discussion of the curriculum.
  - Sarah Phillips discussed pathways for students to receive retroactive credit for course completion.
  - John Henneman's asked what was meant by "low voltage" in CET 111 & 211. Gina said that student hands-on activities will primarily involve voltages of 24V and lower.
  - Trent Armbrust asked about internships. Jim Genandt mentioned that the high-security nature of CET buildings could make finding internship partners difficult, but that we will look for opportunities. Several members discussed the merits of apprenticeship and capstone programs.
  - Jim Genandt mentioned the Mechatronics Engineering Technology (MET) program that MATC will be building.
  - Emphasis was placed on a need for evening classes for BRI employees, as well as other full-time employees.
  - Keven Ward from TRANE could not make the meeting, but sent an email stating that he and colleagues at TRANE have reviewed the curriculum and approve of it.

### Action Item

After explanation and discussion, President Jim Genandt requested motion to approve curriculum as-is or with alterations. Chad Austin moved to approve the curriculum as is. John Henneman seconded. Motion carried 11 yeas, 0 nays.

### Lab Equipment/ Support Needs

- Gina Becker distributed a list of equipment, supplies, and support needed for the lab project.
- All donations including monetary for Scholarships, equipment are needed and appreciated. Please contact Tracy Geisler, Executive Assistant/ Resource Development Coordinator at <a href="mailto:tracygeisler@manhattantech.edu">tracygeisler@manhattantech.edu</a> and/or 785-320-4563.
- Jim Genandt discussed the importance of Letters of support for the program that are needed for the Kansas Board of Regents and Tech Ed Authority. Tracy had sent a request for the letters last week; she will send a reminder. Please send your letters to <u>tracygeisler@manhattantech.edu</u>.
- BRI staff recommended MATC pursue networking opportunities through several organizations: ABSA, CDC, Midwest Area Biosafety Network.

Gina Becker will be emailing out the electronic flyers on the CET program to the BILT team as discussed today. If you have further questions, please contact Gina Becker at <u>ginabecker@manhattantech.edu</u> and/or <u>garymaple@manhattantech.edu</u>

Meeting adjourned at 12:53PM.

### **APPENDIX J**

\_\_\_\_\_

Minutes:Curriculum CommitteeDate: 2/15/2019Members Present:Marcey Fickbohm-Chair, Cindy Barnes, Laurie Johnson, Brian Koch, Lana Lind, Justin Meuli, Sarah Phillips (via speaker phone), Morgen Stoecklein, Blaise Wilson. Visitors: Gina Becker, Critical Environments Program Director; Bill Gilligan, INT InstructorTime: 0900Members Absent:Janae Haskell, Tony Kim, Kate McNealPlace: 104ARecorder:Laurie Johnson (for Kate McNeal)				
AGENDA ITEM	DISCUSSION	ACTION TAKEN		
Call to order		The meeting was called to order at 0905		
Acceptance of Minutes	Corrections to Minutes of 11/16/2018: • Agenda Item #2 • EPD199 Changed EPD102 to EPD103 • EPD137 Changed to EPD1376 • EPD102 Changed to EPD103; changed course prefix to 'EPD'	Motion to accept with changes: Justin Second: Laurie Motion carried		
<u>Old Business</u> :				
1. Course Change/New Course form changes		Tabled		
2. Prerequisites vs. co- requisites		Tabled Lana and Rachel to follow up		
New Business:				
1. INT Cert C Request	To meet industry needs, it was developed so students can enter the workforce more quickly. Cert C requires 52 credit hours as opposed to the 63 required for the AAS. On recommendation of the committee, MAT108 Beginning Algebra will be the required math class.	Motion to approve w/changes: Justin Second: Brian Motion carried		
		Mation to construct Ois to Oceand Dia		
2. BIO230 Change Form and Course Outline	Competencies added for clarification.	Motion carried		

AGENDA ITEM	DISCUSSION	ACTION TAKEN
BTR1023 New Course Form and Course Outline	<ul><li>BTR1023 OSHA 30 (2 CR) To meet industry needs, OSHA 30 will be required for building trades students. It is required for certificate, AAS, and can be taken as an elective.</li><li>High school students will continue taking OSHA 10. Question was posed whether the increase in credit hours will increase overall credit hours of the program. Outcomes and competencies will be revised per CET101.</li></ul>	Rich will revise outcomes and competencies.
CET Critical Environment Technologies	<ul> <li>CET101 OSHA 30 General Industry (2 CR)</li> <li>CET111 Electrical Fundamentals I (4 CR)</li> <li>CET112 Electrical Fundamentals II (3 CR)</li> <li>CET113 Basic Controls (5 CR)</li> <li>CET121 Building Systems &amp; CET: Electrical Systems &amp; Lighting (2CR)</li> <li>CET122 Building Systems &amp; CET: HVAC (2CR)</li> <li>CET123 Building Systems &amp; Critical Environments: Security (1 CR)</li> <li>CET124 Plumbing and Waste Neutralization</li> <li>Courses will be piloted in fall 2019 and promoted to industry partners. Badges will be awarded (instead of college credit) based upon options: (1) Building Automation; (2) HVAC; and (3) IT.</li> <li>Sarah is working with KBOR to obtain CIP codes.</li> <li>Laura stated that students cannot receive financial aid for non-KBOR approved courses. Goal is to offer AAS in CET within the three years of the NSF grant.</li> </ul>	Motion to approve course offerings fall 2019: Brian Second: Cindy Motion carried Course outlines will be approved at a later date.
Setting Date for Next Meeting		
	Next Meeting ???? @ 0900 Room 104A	
Agenda Items for Next Meeting:		
Adjournment	The meeting adjourned at 9:57 a.m.	Motion to adjourn: Justin Second: Lana Motion carried

Minutes: Curriculum Committee	Date: 10/18/2019
Members Present: Marcey Fickbohm-Chair, Brian Koch (Vice-Chair), Laura Weiss-Cook, Morgen Stoecklein, Justin Meuli, Deirdre Greeley, Alex Anderson Guests: Bill Gilligan (Program Faculty for Information & Network Technology)	Time: 10:00
<b>Members Absent:</b> Suzanne Duncan, Cindy Barnes, Tony Kim, Rachel Sherley, Blaise Wilson, Janae Haskell, Sarah Phillips (Ex-Officio),	Place: 104A
Recorder: Morgen Stoecklein (Interim Recorder)	

AGENDA ITEM	DISCUSSION	ACTION TAKEN
Call to order		The meeting was called to order at 10:06am
Acceptance of Minutes	Minutes of 9/13/2019	Motion to accept: Brian Second: Marcey Motion carried
<u>Old Business</u> :		
1. Course Change/New Course form changes		Morgen-ongoing
2. Prerequisites vs. co-requisites		Morgen-ongoing
New Business		
1. MAT 099 – Course Change Form	<ul> <li>MAT 099: The course hasn't been taught in 4 years and has had very low enrollment. MyMathl ab</li> </ul>	Motion to approve MAT 099: Justin Second: Brian
	component in other entry level math courses meets	Motion carried
2. COM 100 – Course Change Form	the need of students needing refresher or beginning knowledge	Motion to approve COM 100: Justin Second:
		Brian
3. CHM 110 – Course Change	COM 100: The course is being replaced with     Composition Workshop (COM 101) Students were	Motion carried
Form/Course Outline	previously using recitation as a method of placement	Motion to approve CHM 110: Laura Second: Alex
4. CRT 165 – Course Change	requirement for Composition I or Technical Writing. Recitation was not required: Composition Workshop	Motion carried
Form/Course Outline	is a required 1 credit hour course based on	Motion to approve CRT 165: Brian Second: Justin
	placement.	Motion carried
5. 3DT Delete Program Form	CHM 110: Morgen provided clarification that the	Motion to approve 3DT Program: Brian Second:
6. EPD Program Revision	wording used for the suggested prerequisite changes is based on registration processes on how MATC	Deidre Motion carried
Form	evaluates students' transcripts. MATC courses are used as reference for qualification.	

AGENDA ITEM	DISCUSSION	ACTION TAKEN
	• CRT 165: This course is a prerequisite for Critical Environment Technologies as well as a technical elective to be promoted to Information & Network Technology and Automotive Technology students. Changes were made to make the textbook options defined as separate options rather than all required materials. Online option for course modality was suggested and changed.	Motion to approve EPD Program : Brian Second: Justin Motion carried
	<ul> <li>3DT Program: The program is being deleted; however, not all the courses are being deleted. DFT 103 is currently being taught in the high schools.</li> <li>EPD Program: Removing English requirement due to PAC recommendation. Added EPD 103 and replaced EPD 137 with EPD 1376.</li> </ul>	
Open Discussion:		
New Recorder:	Deirdre volunteered to be the recorder for the Curriculum Committee.	
Next Meeting	11-15-19, 10:00am room 104A	
Agenda Items for Next Meeting:		
Adjournment	The meeting adjourned at 10:40am	Motion to adjourn: Morgen Second: Justin Motion carried

### APPENDIX K

Manhattan Area Technical College Board of Directors Meeting February 25, 2020 Room 104a

1. The Board of Directors of the Manhattan Area Technical College met February 25, 2020 at 5:30 p.m. in room 104a.

Members present: Randall Anderes, Therese Adams, Wendy King-Luttman, David Fritchen, L.J. Baker and Timothy Flanary

Members absent: None

Also present Jim Genandt, President/CEO; Tracy Geisler, Executive Assistant/Board Clerk/ Resource Development Coordinator; Sarah Phillips, VP Student Success/CAO/CSAO; Carmela Jacobs, VP Operations/CFO/HR: Josh Gfeller, Chief Information Security Officer; Neil Ross, Dean of Student Services; Chris Boxberger, Director of Title III; John Dietrich, College Attorney

a. Faculty/Staff/SGO/Visitors: Brian Koch, Jeff Pishny, Shannon Baker, Kelly Wright

#### 2. CALL TO ORDER

- Randall Anderes called the meeting to order at 5:30 p.m.
- Board Clerk Tracy Geisler stated that an executive session relating to negotiations would be added to the agenda.
- 3. INTRODUCTIONS:
  - Shannon Baker/Financial Operations Specialist was introduced to the board.
- 4. INCIDENTAL INFORMATION:
  - L.J. Baker discussed the board meeting he attended for the Geary County Community Hospital and the opportunities for the MATC nursing students.
  - Randall Anderes attended the annual KBOR dinner with Jim as a thank you to the board chairs of the Community/Tech Colleges.
- 5. CONSENT AGENDA (Routine items requiring BOD action)\*
  - L.J. Baker moved to approve the Consent Agenda (attachments 1-4), Wendy King-Luttman seconded. Motion carried 6 yeas, 0 nays.
- 6. GENERAL AGENDA (items possibly requiring BOD action)
  - Sarah Phillips presented Automotive Technology Certificate A (attachment 5) for recommendation. Jeff Pishny explained and responded to questions. Therese Adams moved to approve the Automotive Technology Certificate A as presented. Tim Flanary seconded. Motion carried 6 yeas, 0 nays.
  - Sarah Phillis presented Critical Environment Technologies Associated in Applied Science and Certificate B (attachment 6). After discussion, Therese Adams moved to approve the Critical Environment Technologies

Associated in Applied Science and Certificate B as presented. Wendy King-Luttman seconded. Motion carried 6 yeas, 0 nays.

- 7. EVALUATION OF BOARD PROCESS
  - Jim Genandt and Tracy Geisler discussed the current board member openings.
- 8. DISCUSSION OF ENDS (Demonstration, Testimonial, or Report of Results related to Board Mission).
  - Jim Genandt and Sarah Phillips updated the board on the HLC Assessment.
  - Jim Genandt and Chris Boxberger presented the board with a Title III update.
  - Jim Genandt shared an update on USD #383.
  - Jim Genandt presented the board with a legislative update.
- 9. OWNERSHIP LINKAGE (related to Owner Expectations, "Gaps", Meeting Expectations, Identifying New Needs of Employers, etc.).
  - Jim Genandt and Tracy Geisler discussed the updates with resource development and the foundation.
  - Jim Genandt discussed the Wamego City meeting that he attended. The City has agreed to waive the fees that will be associated with permits that will be needed for the purchased property in Wamego.

### EXECUTIVE SESSION: CONSULTATION WITH COLLEGE ATTORNEY - Real property

Therese Adams moved to go into executive session for consultation with college attorney for the body or agency which would be deemed privileged in the attorney-client relationship at 6:14 p.m. and return to open session at 6:24 p.m. L.J. Baker seconded. Motion carried 6 yeas, 0 nays. At 6:24 p.m. Therese Adams moved to return to open session. L.J. Baker seconded. Motion carried 6 yeas, 0 nays. At 6:24 p.m. L.J. Baker moved to go back into executive session for further discussion and return to open session at 6:34 p.m. Therese Adams seconded. Motion carried 6 yeas, 0 nays.

#### IN OPEN SESSION:

In Open Session, Wendy King-Luttman moved to approve the proposed amendment for Wamego Center project and to direct the President and Board Clerk to sign the appropriate documents. L.J. Baker seconded. Motion carried 6 yeas, 0 nays.

EXECUTIVE SESSION: CONSULTATION WITH COLLEGE ATTORNEY – Personnel. Therese Adams moved to go into executive session for consultation with college attorney for the body or agency which would be deemed privileged in the attorney-client relationship at 6:39 p.m. and return to open session at 6:55 p.m. Tim Flanary seconded. Motion carried 6 yeas, 0 nays. At 6:55 p.m. Therese Adams moved to return to open session. L.J. Baker seconded. Motion carried 6 yeas, 0 nays. At 6:55 p.m. Therese Adams moved to go back into executive session for further discussion and return to open at 7:05 p.m. L.J. Baker seconded. Motion carried 6 yeas, 0 nays. At 6:55 p.m. Understand to go back into executive session for further discussion and return to open at 7:05 p.m. L.J. Baker seconded. Motion carried 6 yeas, 0 nays. At 6:55 p.m. Therese Adams moved to go back into executive session for further discussion and return to open at 7:05 p.m. L.J. Baker seconded. Motion carried 6 yeas, 0 nays. At 6:55 p.m. Therese Adams moved to go back into executive session for further discussion and return to open at 7:05 p.m. L.J. Baker seconded. Motion carried 6 yeas, 0 nays. At 7:05 p.m. Therese Adams moved to go back into open session. Wendy King- Luttman seconded.

#### IN OPEN SESSION:

In Open Session, Therese Adams moved to authorize the President or his designee to notify Callie Poland in writing of MATC's intent to non-renew her contract as a faculty member for the 2020-2021 academic year, and that she be notified no later than May 1, 2020. Tim Flanary seconded. Motion carried 6 yeas, no nays.

EXECUTIVE SESSION: CONFIDENTIAL MATTERS – Board member business. Therese Adams moved to go into executive session relating to financial affairs or trade secrets of corporations, partnerships, trusts, and individual proprietorships at 7:06 p.m. and return to open session at 7:17 p.m. Tim Flanary seconded. Motion carried 6 yeas, 0 nays. At 7:17 p.m., Therese Adams moved to return to open session. Wendy King-Luttman seconded. Motion carried 6 yeas, 0 nays.

EXECUTIVE SESSION: CONFIDENTIAL MATTERS – Foundation business. Therese Adams moved to go into executive session relating to financial affairs or trade secrets of corporations, partnerships, trusts, and individual proprietorships at 7:18 p.m. and return to open session at 7:23 p.m. Wendy King-Luttman seconded. Motion carried 6 yeas, 0 nays. At 7:23 p.m., Therese Adams moved to return to open session. L.J. Baker seconded. Motion carried 6 yeas, 0 nays.

ADJOURMENT: Randall Anderes, Board Chair adjourned the meeting at 7:25.