



Mitchell Technical Institute
HEATING AND COOLING TECHNOLOGY
PROGRAM HANDBOOK
2019-2020

Heating and Cooling Technology

PROGRAM HANDBOOK

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Heating and Cooling Technology Mission Statement

It is the mission of the MTI Heating and Cooling Technology Program to provide the skills and knowledge necessary for its graduates to install, maintain, troubleshoot problems, and repair all heating, cooling, and refrigeration equipment, with an emphasis on indoor air quality and green technologies, incorporating good work ethics and customer service.

Graduates of the Heating and Cooling Technology program will be able to:

- Use standard HVAC tools correctly and safely.
- Identify and perform various types of duct layouts.
- Accurately perform load calculations for heating and cooling equipment.
- Compare refrigeration pressures to a P/T chart.
- Install new heating, air conditioning and refrigeration systems.
- Maintain heating, air conditioning and refrigeration systems.
- Use troubleshooting procedures to diagnose heating and cooling equipment faults.
- Install and repair common residential and commercial comfort system controls.
- Perform service technician duties safely.
- Use oral and written communication skills effectively.
- Demonstrate personal and professional ethics and interpersonal skills that are expected in the workplace.

MTI Mission Statement

It is the mission of Mitchell Technical Institute to provide skills for success in technical careers.

Program Costs (2019-2020)

Heating & Cooling Technology Diploma (1 year)									
Credits	Tuition	Dept. Fee	Institute Fee	Grad Fee	State Maint Fee	State Facility Fee	State Tech Fee	Certification Membership Misc Fee	Uniform Fee
36	4356	1260	900	10	180	1260	36	70	132

Heating & Cooling Technology AAS Degree (2 years)										
Year	Credits	Tuition	Dept. Fees	Institute Fee	Grad Fee	State Maint Fee	State Facility Fee	State Tech Fee	Certification Membership Misc Fee	Uniform Fee
1 st	36	4356	1260	900	0	180	1260	36	70	132
Summer	6	726	210	150	0	30	210	6	0	0
2 nd	36	4356	1260	900	10	180	1260	36	40	0

Laptop	\$999
Tools	\$1,860
Books	\$1,052

Total Cost HCT Diploma:	\$11,724
Total Cost HCT A.A.S.:	\$21,479

Program fees are from 2019-20 data. Fees change from year to year due to the state and institutional cost increases.

Program Books/Supplies:

Electricity & Controls for HVAC/R (E-Book)	ISBN: 978-1-4354-8427-6
Refrigeration & Air Conditioning Technology, Complete Lab Manual (E-Book)	ISBN: 978-1-337-39938-8
Refrigeration & Air Conditioning Technology Cengage Unlimited (MindTap)	ISBN: 978-0-3577-00051-1
Practical Sheet Metal Layout Manual, 6 th Edition	ISBN: 0 912914 67 X
Drawing Kit	
Universal R-410A Safety & Training	ISBN: 1-930044-12-7
Copeland Electrical Handbook, 2010-2011 Edition	
Building Automation-Control Devices and Applications	ISBN: 978-0-8269-2000-3
Delmar Online Training Simulation for HVAC (comes with MindTap)	ISBN: 978-1-133-59438-3

Program Tools:

Students will be required to purchase and use the following basic hand tools. **It is expected that all students acquire each of the required tools and bring them to lab each day.** Tools may be purchased at the MTI Bookstore according to the following price list.



Student Name:

HCT Tool List 2019-2020 School Year

Total Kit Cost: \$1,860.00
(PLEASE ADD 6.5% TAX)

MTI Bookstore
Main Campus
1800 E Spruce St
Mitchell, SD 57301
Phone: 605-995-3019
Fax: 605-995-3083

Qty.	Part #'s	Description
2	22984	Hose set w/seal right fittings (REQUIRED 2)
2	9611	1/4" Tee Connector (REQUIRED 2)
1	ET1	Electric Tape
1	CR18	HP-2 Riveter Gun
1	LED-12	12 LED Flashlight
1	PDT650	Thermometer, Pocket Digital, Folding-Knife Style
1	41229	Brush, Wire
1	331-9	Level, Torpedo
1	20911	Wrench Set (6", 9 piece), Folding
1	86600	Nut Setter (magnetic 1/4")
1	1010	Long Nose Wire/Crimper, Cutter
1	11045	Wire Stripper
1	70074	Ratchet Wrench, Offset, w/ Hex Adaptor
1	D228-7	Cutter, Diagonal (7")
1	D203-6	Pliers, Long Nose/Side Cutting (6")
1	526	Pliers, Slip Joint (6")
1	86601	Nut Setter (magnetic 5/16")
1	MW-P6510L	Snips, Aviation (left hand, offset)
1	MW-P6510R	Snips, Aviation (right hand, offset)
1	IM-05	Mirror, Inspection
1	PFS18	1/8 Sheet Metal Drill Bit
1	31010	Pipe Wrench (10")

1	GL 12	Grip Lock Pliers, 12.5"
1	MW-C5	Crimper (5 Blade)
1	18	Divider (11")
1	MW-S1	Seamer, Hand (6")
1	SH3	Hammer, Setting (18oz.)
1	11015	Utility Knife
1	12F	Folding Tool
1	51-621	Curved Claw Hammer
1	68-012	Screwdriver (6 in 1)
1	85075	Screwdriver Set (5 Piece)
1	T20275	Flare / Swage Kit
1	M12N	Snips, Combination (aluminum, 12")
1	TM-125	Measuring Tape (25'x1")
1	61158	Fin Tool Kit
1	DS3	Duct Stretcher
1	A40	Sheet Metal Scribe
1	TPC-212	Temperature Sensor (pipe clamp)
1	SC3C	Scratch Awl
1	MW-N1	Notcher, Hand
1	HS33	Meter, Digital
1	CBBLK-1124	Tool Tote, Black, Soft Side, 11W X 24L X 12H, or Tool Box
1	9700	Pivot Head Ratcheting Wrench Set
1	646M	Nut Drivers (1/4" & 5/16")
1	41212	Manifold Gauge Set (Standard)
1	42001	Manifold Gauge Set (410A)
1	T20128A	Tube Cutter, Small (1/8"-5/8")
1	T20274P	Tube Cutter (1/8"-1 3/8")
1	631M	Nut Driver Set (7 piece Magnetic)
1	87-369	Adjustable Wrench 8"
1	87-471	Adjustable Wrench 10"
1	64051205	Safety Glasses
1	92838	Valve Core Removal Tool

Part numbers on tools might vary from vendors.

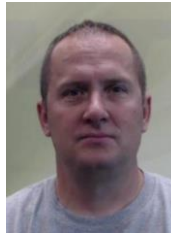
Program Tool Kit prices vary from year to year.

Meet the HCT Faculty



Jason Juhnke, Instructor/Dept. Head

- 1995 graduate of MTI HVAC program
- 24 years working in HVAC industry
- NATE-Certified- A/C & Heat Pumps
- SkillsUSA Lead Advisor
- Teaching HV-111, HV-142, HV-122, HV-231, HV-244, HV-160, HV-251, HV-252, HV-202, HV-259, HV-290



Lee Johnson, Instructor

- Natural Gas Technology/HCT Instructor
- 1995 MTI graduate, Propane & Natural Gas Technologies
- Teaching HV-151, HV-121, HV-132, HV-152, HV-232



Todd Braun, Instructor

- Electrical Construction & Maintenance/HCT Instructor
- 2004 MTI graduate, Electrical Construction & Maintenance
- SD Journeyman Electrician, South Dakota Electrical Council
- Teaching Class HV-101

HCT Program Lab Expectations and Scoring Rubric

Students will be graded daily for their performance in lab courses based on the following expectations and points.

Expectations	Accomplished 4	Competent 3	Needs Improvement 2	Limited 1
Safety: <ul style="list-style-type: none"> • Safety Glasses • Safety Gloves • Ladder Safety • Lifting Practices 	<ul style="list-style-type: none"> • Always wears safety glasses • Always thinks ahead • Consistently follows safety practices 	<ul style="list-style-type: none"> • Mostly wears safety glasses • Mostly thinks ahead • Mostly follows safety practices 	<ul style="list-style-type: none"> • Sometimes wears safety glasses • Sometimes thinks ahead • Sometimes follows safety practices 	<ul style="list-style-type: none"> • Rarely wears safety glasses • Rarely thinks ahead • Rarely follows safety practices
On-Time and Prepared for Lab: <ul style="list-style-type: none"> • Punctuality • Prepared for Lab 	<ul style="list-style-type: none"> • Arrives on time or even early to Lab • Has all required hand tools 	<ul style="list-style-type: none"> • 5 minutes late • Has most of the required hand tools 	<ul style="list-style-type: none"> • 10 minutes late • Is missing some of the required hand tools 	<ul style="list-style-type: none"> • 15 minutes late • Does not have the required hand tools
Staying on Task: <ul style="list-style-type: none"> • Following Directions • Attention to Detail • Task-Time • Work Habits 	<ul style="list-style-type: none"> • Always follows directions • Always shows attention to detail • Shows excellent use of time • Excellent work habits 	<ul style="list-style-type: none"> • Mostly follows direction • Mostly shows attention to detail • Tasks completed in reasonable time • Mostly has good work habits 	<ul style="list-style-type: none"> • Sometimes follows direction • Sometimes shows attention to detail • Tasks take longer than expected • Sometimes has good work habits 	<ul style="list-style-type: none"> • Rarely follows direction • Rarely shows attention to detail • Wastes time • Rarely has good work habits
Working with Others: <ul style="list-style-type: none"> • Participation • Leadership Skills • Ability to Handle Criticism and Conflict 	<ul style="list-style-type: none"> • Excellent participation • Takes leadership role • Works well with instructors and others • Positive attitude and cheerful 	<ul style="list-style-type: none"> • Works well as part of a team, leading when appropriate • Can handle criticism and conflict • Maintain good relationships with others 	<ul style="list-style-type: none"> • Content to sit back and let others take lead • Uncomfortable with criticism and conflict • Does little to help with solving problems 	<ul style="list-style-type: none"> • Waits to be told what to do • Responds negatively to criticism and conflict • Does not relate or work with others
Clean Up: <ul style="list-style-type: none"> • Work Area Cleaned • Tools/ Supplies Put Away • Cleaning Lab Areas 	<ul style="list-style-type: none"> • Always keeps work area clean • Always puts tools and supplies away • Excellent cleaning habits 	<ul style="list-style-type: none"> • Mostly keeps areas clean • Mostly put things away • Mostly helps with cleaning the lab 	<ul style="list-style-type: none"> • Sometimes keeps work area cleaned • Sometimes puts tools and supplies away • Sometimes helps with cleaning the lab 	<ul style="list-style-type: none"> • Rarely keeps work area cleaned • Rarely puts tools and supplies away • Rarely helps with cleaning the lab
Competencies: <ul style="list-style-type: none"> • Completed • Problem Solving • Advice Needed 	<ul style="list-style-type: none"> • Completes all competencies • Enjoys challenges and solving problems • Works confidently without teacher assistance 	<ul style="list-style-type: none"> • Completes most of the competencies • Mostly enjoys challenges and solving problems • Requires minimal assistance from teacher 	<ul style="list-style-type: none"> • Completes some of the competencies • Is reluctant to take on challenges and solving problems • Requires some assistance from teacher 	<ul style="list-style-type: none"> • Completes few or none of the competencies • Resists taking on challenges and solving problems • Requires extensive assistance and advice from teacher

Attendance Policy

Attendance Guidelines

Enrollment at MTI assumes maturity, seriousness of purpose, and self-discipline. Every student is expected to attend each meeting of all classes for which he/she is registered, to arrive on time, and to stay for the full class period. MTI recognizes that absences occur as a result of circumstances beyond a student's control, as well as from a student's failure to accept responsibility for attending class regularly. To that end, the following attendance policy will be followed:

Because employers consider attendance to be an extremely valuable employee characteristic and because the HCT Department wants you to receive full value for your education dollar, it is imperative that you attend each class period, including hands-on labs. Quizzes and tests are based on lecture material and thus require daily participation.

- A. Each day of class you will earn fifteen points for attendance and for participation.
- B. If you know you are going to be absent, make-up work is to be completed before the absence occurs.
- C. If the absence is unexpected, make-up work will be given credit if you call the HCT office.
- D. You will lose two points for being late for class; after 15 minutes you will lose four points.
- E. If you have three unexcused absences, an early alert form will be filed with MTI's Student Services.
- F. If you are going to be absent or tardy you must notify the instructor 30 minutes prior to the absence or tardy to receive credit.

Make up Work

- A. It is the student's responsibility to make sure that make-up work is completed.
- B. Quizzes will not be allowed to be made up.
- C. Students will be allowed to make up tests and/or projects if the following is met:
 - 1. The student contacts the instructor.
 - 2. The student is expected to complete make-up work in a timely manner.
 - 3. If homework, quizzes, and test are on days that are excused absences, they will be due the next day.
 - 4. If work is not made up after an excused absence you will receive a zero on that assignment.
 - 5. If work is not handed in on the due date, 1 point per day will be deducted from the total points from that assignment.
 - 6. If an assignment is closed and would like it reopened there will be a 5-point deduction from that assignment, plus 1 point deducted per day passes the due date. And it will be due the next day.

Tardiness

More than four tardies will be documented as one absence.

Safety/Lab Policies

Classroom Policy

Students are being trained to secure employment in the field. Appropriate language and dress are required by business and industry and are a requirement of the MTI's HCT Department.

Cell phones and food will not be tolerated in classrooms or labs. Cell phones must be on silent and all calls must be taken outside of classrooms if prior approval is given. There will be 5 points deducted per call if not followed.

HCT Program Fire/Storm Procedures

Fire Alarms:

Students that are in the lab areas will exit the building and immediately proceed to the southeast corner of the HCT lab loading area and stand by the fire hydrant.

Students that are in the classroom will immediately proceed to the south exit and, after exiting the building, head to the east to gather at the ETC parking lot.

Tornado/Storm Alarms:

Students will leave the classrooms or labs and immediately proceed to the locker areas or bathrooms.

Lab Safety Policy

1. Safety glasses are required in lab and training labs at all times.
2. No open toe shoes worn in lab.
3. Shorts are not allowed in lab.
4. No tank tops are allowed in lab.
5. Gloves are required in lab.

In the event of an accident or injury occurring in lab or training labs, an instructor must be notified immediately.

Site House Safety Policy

1. Safety glasses must be on at all times.
2. Hard hats must be on if students are working above you.
3. Ear protection must be used in noisy areas.
4. No open toe shoes.
5. No shorts and tank tops.

MTI Policies

STUDENT HANDBOOK/CATALOG MTI 1003

Many practices and procedures affecting students are found within the Mitchell Technical Institute Student Handbook and the Mitchell Technical Institute General Catalog. These documents shall be updated annually and shall be maintained and made available to students and staff on the MTI website. Students attending MTI shall be informed that they are responsible for the content of the Student Handbook and that it is their responsibility to comply with the provisions therein.

WEAPONS POSSESSION MTI 1033

Students and nonstudents (including adults, visitors and staff) are not permitted to carry, possess, use, store, distribute, transfer or transport a weapon in or on any school property, vehicle, or premises, or in any other building or property being used for school purposes or functions, except as explicitly stated in the provisions of this policy. A “weapon” includes any controlled, dangerous or deadly item, destructive device or explosive, ballistic knife, stun gun, firearm or air gun, including those intended primarily for imitative or noise-making purposes. MTI reserves the right to inspect any person, carrying bag, and/or vehicle on campus when a violation of this policy is suspected.

For the purposes of this policy, the following definitions shall apply

1. “Controlled weapons” shall include a firearm silencer, machine gun or short shotgun. A firearm silencer is any instrument, attachment, weapon or appliance for causing the firing of any gun, revolver, pistol or other firearm to be silent or intended to lessen or muffle the noise of the firing of any such weapon. A machine gun is any firearm of whatever size and design that automatically discharges two or more cartridges by a single function of the firing device. A short shotgun is a shotgun with a barrel less than 18 inches long or with an overall length of less than 26 inches.
2. “Dangerous or deadly weapon” is any firearm, knife or device, instrument, material or substance, whether animate or inanimate, which is calculated or designed to inflict death or serious bodily harm or which can be used or misused in a manner to cause death or serious bodily harm.
3. “Destructive device” is any bomb, grenade, explosive missile or similar device or any launching device therefore, or any breakable container which contains a flammable liquid with a flashpoint of 150 degrees Fahrenheit or less and has a wick or similar device capable of being ignited.
4. “Explosive” is any substance or combination of substances that is used for the purpose of detonation and which, upon exposure to any external or internal force or condition, is capable of a relatively instantaneous release of gas and heat.
5. “Ballistic knife” is a knife encased in a tubular metal sheath which when removed, uncovers a detachable blade that can be propelled by a spring mechanism operated at the push of a button.

6. "Stun gun" is any battery-powered, pulsed electrical device of high voltage and low or no amperage that can disrupt the central nervous system can cause temporary loss of voluntary muscle control of a person.

7. "Firearm" includes any weapon which is designed to expel a projectile by action of an explosive, or any other means, the frame or receiver of any such weapon, a muffler or silencer for a weapon, or any explosive, including any poison gas. This shall include BB guns, paint ball guns, and air guns.

If a student violates this policy, the Institute may apply sanctions in accordance to MTI's Non-academic Probation, Suspension, and Expulsion policy (Policy MTI 1036).

Staff who violate this policy shall be subject to personnel discipline procedures and South Dakota Codified Law governing employment dismissal.

DRUG-FREE CAMPUS MTI 1035

PHILOSOPHY

Student and employee safety is a paramount concern to Mitchell Technical Institute, the Mitchell School District No. 17-2, and the Board of Education. Alcohol and drug dependency is an illness and a hazard that interferes with the ability to learn and function responsibly in the school setting and community. Persons abusing controlled substances or under the influence of mood-altering or psycho-active chemicals are a serious risk to themselves and to others. MTI recognizes that chemical abuse (drug and alcohol) has become a serious problem in our country. Substance abuse problems are the responsibility of the individual, home, and community, with the schools sharing in that responsibility. We accept our obligation to establish a positive environment in which these problems can be addressed locally in a helpful and supportive rather than a punitive way. The intent of this policy is to promote healthy living through awareness, prevention, dependency education, and intervention.

LEGAL COMPLIANCE

It is the policy of Mitchell Technical Institute that the unlawful manufacture, distribution, dispensation, possession, use, or being under the influence of a controlled substance on property of MTI or while a student of MTI is engaged in an activity assigned as part of his/her involvement with MTI is prohibited unless said controlled substance is used as prescribed by a doctor.

Students convicted of the possession of illegal drugs while receiving Title IV financial aid may have their financial aid suspended for one year. If a student is convicted of selling drugs, they may have their financial aid eligibility suspended for two years. Additional convictions will add at least two years to the above suspensions.

PREVENTION

The objective of prevention is to promote the personal and social growth of individuals in order to avoid drug and alcohol related problems. Serious health risks are associated with abusers of drugs and alcohol. Heavy alcohol consumption can produce major, irreversible damage to the brain, heart, central nervous system, liver, and other body systems, and may cause intellectual disabilities, birth defects, and reduced

weight to offspring of pregnant women. Some of the effects of commonly abused drugs include skin disorders, malnutrition, ulcers, brain damage, life-threatening infections and diseases, hallucinations, visual disturbances, convulsions, delirium, coma, speech and muscle impairment, violent behavior, loss of concentration and memory, nausea, constipation, increase in pulse rate, damage to liver, kidneys, blood and bone marrow, and death.

MTI's drug prevention program includes annual distribution of this policy to all enrolled students; educating students on the health risks and legal sanctions associated with abuse of alcohol and drugs; and outlining clear procedures in the MTI Student Handbook on how MTI will handle suspected incidences of violations to this policy.

Students are encouraged to seek assistance for substance abuse problems. Students can be assured that voluntarily seeking assistance for these problems will not jeopardize the student's status in school and will be handled in a professional manner, and confidentiality will be protected to the full extent permitted by law.

INTERVENTION PROCEDURES

The student who violates this policy will be referred to the administration of Mitchell Technical Institute. The student will be referred to legal officials, agents, or agencies when appropriate. Depending on the severity, the Institute may require chemical dependency evaluation and/or treatment by a trained chemical dependency counselor. Expenses incurred are the responsibility of the student.

If a student is under the age of 21 or a dependent student, regardless of age, MTI may disclose to a parent or guardian, without the student's consent, information regarding the student's violation of the use or possession of alcohol or a controlled substance.

The student may be suspended or expelled from a program in compliance with SDCL 13-32-4.

SMOKE FREE SCHOOLS MTI 518

The negative effects of smoking on persons who smoke and persons occupying smoking areas are well documented. Mitchell Technical Institute is committed to encouraging healthful living styles and healthful working environments. Because of this commitment, the following policy will apply:

Mitchell Technical Institute will be tobacco/smoke free in all buildings and vehicles. Outside designated smoking areas at each MTI building may be provided. Smoking is prohibited except for the designated smoke area.