CURRICULUM BREAKDOWN

TWO YEAR CURRICULUM - TECHNICAL COLLEGE

FIRST YEAR

FIRST SEMESTER

PROGRAMS

- Reading Blueprints
- Reading Schematics and Symbols
- Using Mathematics in the Plant
- Making Measurements
- Metals
- Non-Metals
- Using Hand Tools
- Using Portable Power Tool
- Industrial Safety and Health
- Developing Troubleshooting Skills
- Force and Motion

TOTAL SEMESTER HOURS - 93

SECOND SEMESTER

PROGRAMS

- Generating Steam in the Power Plant
- Using Steam in the Power Plant
- Basic Electricity/Electronics
- Electrical Safety and Protection
- Single-Phase Motors
- Electrical Troubleshooting Skills
- Understanding Basic Mechanics
- Selecting and Using Lubricants
- Power Transmission Equipment
- Selecting and Maintaining Bearings
- Pumps
- Piping Systems
- Hydraulic Troubleshooting Skills
- Basic Pneumatics
- Industrial Rigging
- Maintenance of Mechanical Drives
- Landscaping Maintenance
- Welding Principles
- The Refrigeration Cycle
- Refrigerants and Refrigerant Oils
- Compressors
- Evaporators and Metering Devices
- Condensers and Cooling Towers

TOTAL SEMESTER HOURS - 76

SECOND YEAR

FIRST SEMESTER

PROGRAMS

- Electrical Measuring Instruments
- Single-Phase Motors
- Three-Phase Systems
- Electrical Troubleshooting Skills
- Selecting and Using Lubricants
- Power Transmission Equipment
- Pumps
- Piping Systems
- Basic Hydraulics
- Hydraulic Troubleshooting Skills
- Basic Pneumatics
- Pneumatic Troubleshooting Skills
- Maintenance of Mechanical Drives
- Locks and Key Systems
- Compressors
- Evaporators and Metering Devices
- Control Systems
- Air Handling Systems
- Cleaning Chemicals

TOTAL SEMESTER HOURS - 74

SECOND SEMESTER

PROGRAMS

- Industrial Safety and Health
- Introduction to Computers
- The Supervisor's Role in Maintenance
- Work Authorization Techniques
- Improving Performance in Maintenance
- Spoken Communication for Supervisors
- Written Communication for Supervisors
- Taking Corrective Action with Employees
- OSHA's Hazard Communication Standard
- Input/Output Devices I
- How Computers Function
- Input/Output Devices II
- Maintaining/Troubleshooting Computers
- Flat Roof Maintenance
- Examining Energy Conservation Basics
- Introduction to Robotics
- Improving Labor Relations
- Managing a Training Program
- Implementing a Preventive Maintenance Program

TOTAL SEMESTER HOURS - 96

CURRICULUM BREAKDOWN

ONE YEAR CURRICULUM - TECHNICAL COLLEGE

FIRST SEMESTER

PROGRAMS

- Reading Blueprints
- Reading Schematics and Symbols
- Using Mathematics in the Plant
- Making Measurements
- Metals
- Non-Metals
- Using Hand Tools
- Using Portable Power Tool
- Industrial Safety and Health
- Developing Troubleshooting Skills
- Force and Motion

TOTAL SEMESTER HOURS - 93

SECOND SEMESTER

PROGRAMS

- Generating Steam in the Power Plant
- Using Steam in the Power Plant
- Basic Electricity/Electronics
- Electrical Safety and Protection
- Single-Phase Motors
- Electrical Troubleshooting Skills
- Understanding Basic Mechanics
- Selecting and Using Lubricants
- Power Transmission Equipment
- Selecting and Maintaining Bearings
- Pumps
- Piping Systems
- Hydraulic Troubleshooting Skills
- Basic Pneumatics
- Industrial Rigging
- Maintenance of Mechanical Drives
- Landscaping Maintenance
- Welding Principles
- The Refrigeration Cycle
- Refrigerants and Refrigerant Oils
- Compressors
- Evaporators and Metering Devices
- Condensers and Cooling Towers

TOTAL SEMESTER HOURS - 76

IMI TRAINING CURRICULUM

IMI Certification provides a structured curriculum for continuing education and internationally-recognized, industry-wide credentials which identify the member's level of knowledge and skills. Students can prepare for IMI certification by utilizing the ***Hampden Engineering Industrial Maintenance Technician Program****. The IMI certification program is based on comprehensive testing. Exams are conducted only by proctors appointed by the International Vice President - Education, Training & Professional Development (or by his designate), and only under the strictest of conditions to ensure credibility and integrity. All exams are "closed-book."*

IMI OFFERS THE FOLLOWING CERTIFICATIONS

Certified Maintenance Technician I: CMT-I (entry level)

Certified Maintenance Technician II: (CMT-I is a prerequisite)

Certified Maintenance Technician III: CMT-III (CMT-II is a prerequisite)

For supervisors & managers:

Certified Maintenance Professional: CMP (CMT-I is a prerequisite) *

Certified Maintenance Manager: CMM (CMP is a prerequisite)

CMT-III, CMP, & CMM are entitled to use initials after their name

CERTIFIED MAINTENANCE TECHNICIAN I CMT-I

Unit 101 Reading Blueprints

Lesson 1	Introduction to Blueprints
Lesson 2	Machine Parts
Lesson 3	Machine Drawings
Lesson 4	Sheet Metal Drawings
Lesson 5	Building Drawings
Lesson 6	Hydraulic and Pneumatic Drawings
Lesson 7	Piping and Plumbing Drawings
Lesson 8	Electrical Drawings
Lesson 9	Air Conditioning and Refrigeration Drawings
Lesson 10	Sketching

Unit 102 Reading Schematics and Symbols

Lesson 1	Introduction to Schematics and Symbols
Lesson 2	Symbols on Schematics
Lesson 3	Electrical Symbols
Lesson 4	Electrical Diagrams
Lesson 5	Piping Symbols
Lesson 6	Piping Diagrams
Lesson 7	Hydraulic and Pneumatic Symbols
Lesson 8	Hydraulic and Pneumatic Diagrams
Lesson 9	Air Conditioning and Refrigeration Systems

Unit 108 Using Portable Power Tools

Lesson 1	Electric Drills
Lesson 2	Electric Hammers
Lesson 3	Pneumatic Drills and Hammers
Lesson 4	Screwdrivers, Nutrunners, and Wrenches
Lesson 5	Linear-Motion Saws
Lesson 6	Circular Saws
Lesson 7	Routers and Planes
Lesson 8	Electric Sanders
Lesson 9	Grinders and Shears
Lesson 10	Tool Sharpening

Unit 109.1 Industrial Safety and Health

Lesson 1	Introduction to Safety and Health
Lesson 2	Government Safety Regulations
Lesson 3	Personal Protective Equipment
Lesson 4	Chemical Safety
Lesson 5	Tool Safety
Lesson 6	Material Handling
Lesson 7	Working Safely with Machinery
Lesson 8	Working Safely with Electricity
Lesson 9	Electrical Equipment Safety
Lesson 10	Fire Protection
Lesson 11	Protecting Your Health
Lesson 12	A Safe Work Environment

Unit 110 Developing Troubleshooting Skills

Lesson 1	Introduction to Troubleshooting
Lesson 2	Working with Other People
Lesson 3	Troubleshooting Techniques
Lesson 4	Aids to Troubleshooting
Lesson 5	Preparing for Troubleshooting
Lesson 6	Using Schematics and Diagrams
Lesson 7	Solving Mechanical Problems
Lesson 8	Solving Electrical problems
Lesson 9	Breakdown Maintenance
Lesson 10	Planned Maintenance

Unit 391 Force and Motion

Lesson 1	Scalars and Vectors
Lesson 2	Motion along a Straight Line
Lesson 3	Acceleration
Lesson 4	How to Describe Force
Lesson 5	Force and Acceleration

CERTIFIED MAINTENANCE TECHNICIAN II CMT-II

Unit 112 Generating Steam in the Power Plant

Lesson 2	Boiler Operation
Lesson 3	Boiler Maintenance

Unit 113 Using Steam in the Power Plant

Lesson 2	Boiler Instrumentation, Controls, and Safety Gauges

Unit 201 Basic Electricity/Electronics

Lesson 1	Introduction to Electricity
Lesson 2	Static Electricity
Lesson 3	Current Electricity
Lesson 4	Magnetism
Lesson 5	Current, Resistance, and Potential Difference
Lesson 6	Electrical Components
Lesson 7	Conductors
Lesson 8	DC Circuits
Lesson 9	AC Circuits
Lesson 10	Electronics

Unit 205.1 Electrical Safety and Protection

Lesson 1	Electrical Hazards

Unit 207 Single-Phase Motors

Lesson 9	Motor Installation
Lesson 10	Motor Maintenance

Unit 210 Electrical Troubleshooting Skills

Lesson 9	Troubleshooting Lighting Systems
Lesson 10	Saving Time in Troubleshooting

Unit 301 Understanding Basic Mechanics

Lesson 7	The Safe Use of Hand Tools
Lesson 8	The Safe Use of Portable Power Tools
Lesson 9	Fasteners

Unit 302 Selecting and Using Lubricants

Lesson 1	Principles of Lubrication
Lesson 4	Oils and Their Applications
Lesson 5	General Purpose Greases
Lesson 9	Lubricant Storage and Handling

Unit 303.1 Power Transmission Equipment

Lesson 1	Belt Drives
Lesson 2	Chain Drives

Unit 304 Selecting and Maintaining Bearings

Lesson 1	Bearings and Shafts
Lesson 2	Plain Journal Bearings I
Lesson 3	Plain Journal Bearings II

Lesson 4	Anti-friction Bearings I
Lesson 5	Anti-friction Bearings II
Lesson 6	Ball and Roller Bearings
Lesson 7	Specialized Bearings
Lesson 8	Bearing Seals
Lesson 9	Lubrication
Lesson 10	Bearing Maintenance

Unit 305 Pumps

Lesson 1	Pump Development and Application
Lesson 2	Basic Pump Hydraulics
Lesson 3	End-Suction Centrifugal Pumps
Lesson 4	Propeller and Turbine Pumps
Lesson 5	Rotary Pumps
Lesson 9	Packings and Seals
Lesson 10	Pump Maintenance

Unit 306 Piping Systems

Lesson 1	Piping Systems
Lesson 2	Metal Piping
Lesson 3	Non-metallic Piping
Lesson 4	Tubing

Unit 308 Hydraulic Troubleshooting Skills

Lesson 1	Hydraulic Systems
Lesson 2	Hydraulic Schematic Diagrams
Lesson 3	Installing Hydraulic Components
Lesson 4	Installing Pipes and Tubes
Lesson 5	Selecting Hydraulic Fluids

Unit 309 Basic Pneumatics

Lesson 1	Pneumatic Principles
Lesson 2	Reciprocating Compressors
Lesson 3	Rotary Compressors
Lesson 4	Primary Air Treatment
Lesson 5	Secondary Air Treatment

Unit 318 Industrial Rigging

Lesson 1	Introduction to Industrial Rigging
Lesson 7	Scaffolds and Ladders

Unit 341 Maintenance of Mechanical Drives

Lesson 1	Chain Drives
Lesson 2	Belt Drives

Unit 375 Landscaping Maintenance

Lesson 1	Basic Plant Care
Lesson 2	Shade Trees
Lesson 3	Turf Management

Lesson 4 Shrub and Flower Care

Lesson 5 Pest and Disease Control

Unit 417 Welding Principles

Lesson 1 Fundamentals of Welding

Unit 431 The Refrigeration Cycle

Lesson 1 Refrigeration and Air Conditioning Basics

Lesson 3 Basic Refrigeration Cycle

Unit 432 Refrigerants and Refrigerant Oils

Lesson 1 Physical Properties of Refrigerants

Lesson 2 Refrigerant Classification and Applications

Unit 433 Compressors

Lesson 1 Introduction to Compressors

Unit 434 Evaporators and Metering Devices

Lesson 1 Introduction to Evaporators

Unit 435 Condensers and Cooling Towers

Lesson 1 Air Cooled Condensers

Lesson 2 Water Cooled Condensers

CERTIFIED MAINTENANCE TECHNICIAN III CMT-III

Unit 204.1 Electrical Measuring Instruments

Lesson 1 Principles of Meter Operation

Lesson 2 Ampmeters, Voltmeters, and Wattmeters

Lesson 3 Resistance Measurement

Lesson 4 Multimeters

Unit 207 Single-Phase Motors

Lesson 1 Introduction to Single-Phase Motors

Lesson 2 Split-Phase Motors

Lesson 3 Capacitor Motors

Lesson 4 Repulsion Motors

Lesson 5 Universal Motors

Lesson 6 Special Motors

Unit 208 Three-Phase Systems

Lesson 1 Principles of Three-Phase Motors

Lesson 2 Induction Motors

Lesson 3 Synchronous Motors

Lesson 4 Multi-speed Motors

Lesson 5 Maintaining Three-Phase Motors

Lesson 6 Motor Starters

Lesson 7 Three-Phase Motor Controllers

Unit 210 Electrical Troubleshooting Skills

Lesson 1 Troubleshooting with Electrical Schematics

Lesson 2 Troubleshooting with Building Drawings

Unit 302 Selecting and Using Lubricants

Lesson 10 Lubrication Management

Unit 303.1 Power Transmission Equipment

Lesson 3 Gears
Lesson 4 Gear Drives
Lesson 5 Adjustable Speed Drives
Lesson 7 Shaft Coupling Devices
Lesson 8 Clutches and Brakes

Unit 305 Pumps

Lesson 6 Reciprocating Pumps
Lesson 7 Metering Pumps
Lesson 8 Special-Purpose Pumps

Unit 306 Piping Systems

Lesson 5 Hoses
Lesson 6 Fittings
Lesson 7 Common Valves
Lesson 8 Specialized Valves
Lesson 9 Strainers, Filters, and Traps
Lesson 10 Accessories

Unit 307 Basic Hydraulics

Lesson 1 Principles of Hydraulics

Unit 308 Hydraulic Troubleshooting Skills

Lesson 6 Planning System Maintenance
Lesson 7 Troubleshooting Systems
Lesson 8 Troubleshooting Valves
Lesson 9 Troubleshooting Cylinders
Lesson 10 Troubleshooting Pumps and Motors

Unit 309 Basic Pneumatics

Lesson 6 Piping, Hoses, and Fittings
Lesson 7 Directional Control Valves
Lesson 8 Pressure-Control Valves
Lesson 9 Pneumatic Cylinders
Lesson 10 Pneumatic Motors and Rotary Actuators

Unit 310 Pneumatic Troubleshooting Skills

Lesson 1 Pneumatic Systems
Lesson 2 Pneumatic Schematic Diagrams
Lesson 3 Installation of System Components
Lesson 4 System Maintenance

Unit 341 Maintenance of Mechanical Drives

Lesson 3 Open Gear Drives
Lesson 4 Enclosed Gear Drives

Unit 374 Locks and Key Systems

Lesson 1	Commonly Used Doors and Locks
Lesson 2	How Locks Operate
Lesson 3	Installing Locks
Lesson 4	Maintaining and Adjusting Locks

Unit 433 Compressors

Lesson 7	Compressor Maintenance, Troubleshooting, and Repair

Unit 434 Evaporators & Metering Devices

Lesson 4	Defrosting, Cleaning & Maintaining Evaporators
Lesson 5	Metering Device Types, Maintenance, and Troubleshooting

Unit 437 Control Systems

Lesson 1	Introduction to Control Systems
Lesson 2	Sensors and Control Devices
Lesson 3	Automatic Control Systems
Lesson 4	Control of Refrigeration & AC Processes
Lesson 5	Maintaining and Troubleshooting Controls

Unit 438 Air Handling Systems

Lesson 1	Air Movement and Distribution
Lesson 2	Fans and Fan Motors
Lesson 3	Ductwork Types, Fabrication and Repair
Lesson 4	Air Cleaning and Filtration
Lesson 5	Air System Balancing and Troubleshooting
Lesson 6	Indoor Air Quality & Sick Building Syndrome

Unit 451 Cleaning Chemicals

Lesson 1	Using Chemicals Safely
Lesson 2	Introduction to Cleaning Chemicals
Lesson 3	Cleaning Agents
Lesson 4	Disinfectants
Lesson 5	Special-Purpose Cleaning Chemicals