Heating, Ventilating, Air Conditioning, Refrigeration and Sustainable Energy

Teacher Craig Migliaccio **Voice** 609 380 0200 ext. 330
Room # 330 **E-mail*** cmigliaccio@capemaytech.com

Course Description: HVACR/SE is a three year consecutive program that is designed to give students the understanding and hands-on skills needed to enter into the college and career fields of Heating, Ventilating, Air Conditioning, Refrigeration as well as Green Energy applications such as Photovoltaics, Solar Water Heating, and Building Weatherization.

Course Objective:

The first year of HVACR and Sustainable Energy is focused on safety, knowledge, and skillsets to apply numerous tools and materials to the building structure. This includes the foundations of electric and activities such as measuring, soldering, brazing, flaring, gas piping, ductwork, and wiring as well as their application to the building structure.

Course Requirements:

Level 1- Module tests, Module Projects, Participation, Sketches and Diagrams, Cross Curriculum Safety Tests, Midterm, and Final exam

Criteria for Assessing Daily Student Performance:

Tests and Quizzes	40%	Module Tests, Sketches and Diagrams, Cross Curriculum Safety Tests
Participation	45%	Participation includes effort, safety, teamwork, attendance, and social skills demonstrated.
Projects	15%	Each project demonstrates the level of mastery as it pertains to the module.

The Final Grade is calculated by the following criteria

Each Marking Period Grade	20% (80% total)
Benchmark Assessment Midterm	10%
Benchmark Assessment Final	10%

Textbooks, Related Readings:

-Korcal, M. J., Petit Sr., R. F., Pacella, J. R., Campbell, P., Collins, T., & Rasmussen, E. (2008). *Green awareness energy efficiency, comfort conditioning, plumbing, and electrical*. USA: Esco Press.

-International Code Council Inc. (2012). *International fuel gas code*. 400 N. Capital St., N.W. Washington DC 20001: American Gas Association.

-Mullin, Ray C., (2008). *Electrical Wiring Residential (16th Edition).* Clifton Park, NY: Delmar Cengage Learning

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Course Objective: The second year moves into the design, installation, and diagnosis of furnaces and air conditioning systems. The student will gain knowledge and hands-on skills in refrigerants cycles, pressure temperature measurements, charging, sequence of operation, furnace ignition assemblies, heat loads, controls, and troubleshooting. The students will experience an introduction to solar water heating systems. During this year the students will be involved with testing to receive the field required gas line certification.

Course Requirements:

Level 2- Module tests, Module Projects, Participation, Sketches and Diagrams, OSHA 10hr Construction Cert, Midterm, Final exam, CSST Gas Line Certifications

Criteria for Assessing Student Performance:

Tests and Quizzes	40%	Module Tests, Sketches and Diagrams, OSHA 10 Cert, CSST Gas Line Certs
Participation	45%	Participation includes effort, safety, teamwork, attendance, and social skills demonstrated.
Projects	15%	Each project demonstrates the level of mastery as it pertains to the module.

The Final Grade is calculated by the following criteria

Each Marking Period Grade 20% (80% total)
Benchmark Assessment Midterm 10%
Benchmark Assessment Final 10%

Textbooks, Related Readings:

-Korcal, M. J., Petit Sr., R. F., Pacella, J. R., Campbell, P., Collins, T., & Rasmussen, E. (2008). *Green awareness energy efficiency, comfort conditioning, plumbing, and electrical*. USA: Esco Press.

-International Code Council Inc. (2012). *International fuel gas code*. 400 N. Capital St., N.W. Washington DC 20001: American Gas Association.

-Swenson, D. S. (2004). *Hvac heating,ventilating, and air conditioning*. (3rd ed.). Homewood,Illinois 60430-4600: American Technical Publishers, Inc.

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Course Objective: The third year students continue to work with refrigeration cycles as they move on to heat pumps and geothermal heating and cooling systems. During this year we integrate our green and sustainable components into our whole building designs to handle needed heat, heat removal, and electrical loads. This will include hot water solar systems, ventilation, photovoltaics, as well as other sustainable solutions. This year the student will be involved with testing to receive The EPA mandated Universal Refrigerant 608 Cert., The R-410A Safety Cert., and The CSST Flex gas line Cert.

Course Requirements:

Level 3- Module tests, Module Projects, Participation, Sketches and Diagrams, Cross Curriculum Safety Tests, Midterm, Final exam, CSST Flex Gas Pipe Certification, EPA 608 Universal Refrigerant Certification, and the R-410A Refrigerant Safety Certification, Senior Project

Criteria for Assessing Student Performance:

Tests and Quizzes	40%	Module Tests, Sketches and Diagrams, Cross Curriculum Safety Tests, CSST Flex Cert., EPA Universal 608 Cert, R-410A Cert.
Participation	45%	Participation includes effort, safety, teamwork, attendance, and social skills demonstrated.
Projects	15%	Each project demonstrates the level of mastery as it pertains to the module.

The Final Grade is calculated by the following criteria

Each Marking Period Grade	20% (80% total)
Benchmark Assessment Midterm	10%
Benchmark Assessment Final	10%

Textbooks, Related Readings:

-International Code Council Inc. (2012). *International fuel gas code*. 400 N. Capital St., N.W. Washington DC 20001: American Gas Association.
-Tomczyk, J., Nott, J., Shaw, D. (2002) *Universal R410A Safety and Training*. Mount Prospect, Illinois: Esco Press
-Swenson, D. S. (2004). *Hvac heating,ventilating, and air conditioning*. (3rd ed.). Homewood,Illinois 60430-4600: American Technical Publishers, Inc.