

**JEFFERSON COLLEGE**

**COURSE SYLLABUS**

**HRA290**

**NORTH AMERICAN TECHNICIAN EXCELLENCE CERTIFICATION**

1 Credit Hour

Prepared by  
William Kaune

Mary Beth Ottinger, Division Chair, Business & Technical Education  
Elizabeth Check, Dean, Career & Technical Education

## HRA290 North American Technician Excellence (NATE) Certification

### I. CATALOGUE DESCRIPTION

- A. Prerequisite: None
- B. 1 Credit Hour
- C. NATE Certification Class is designed to aid students in preparing to take NATE exams. (F/S)

### II. EXPECTED LEARNING OUTCOMES/CORRESPONDING ASSESSMENT MEASURE

Students will recognize NATE Testing procedures.	Quiz
Students will recognize effective test taking methods.	Quiz & Discussion
Students will review material covered in NATE Exam.	Exam

### III. OUTLINE OF TOPICS

- A. Part 1 Refrigeration and Air Conditioning Tools and Components
  - 1. Personal Safety
  - 2. Hand Tools
  - 3. Basic Construction
  - 4. Refrigerant Safety
  - 5. Refrigerant Theory
  - 6. Refrigerants
  - 7. Lubricants
  - 8. Compressors
  - 9. Air-Cooled Condensers
  - 10. Water-Cooled Condensers
  - 11. Indoor Evaporator Coils
  - 12. Metering Devices
  - 13. Thermostatic Expansion Valves
  - 14. Service Valves
  - 15. Leak Detection
  - 16. Recovery Equipment
  - 17. Soldering and Brazing Safety
  - 18. Soldering and Brazing
  - 19. Manifold Gauges

20. System evacuation
21. Refrigerant Charging
22. EPA Certification Study Guide
23. Core Section
24. Type I Certification
25. Type II Certification
26. Type III Certification
27. Refrigerant Piping
28. Refrigeration Accessories
29. Medium-and Low Temperature Refrigeration
30. Defrost Systems
31. Commercial Refrigeration Electrical Diagrams-Study Section
32. Air Conditioning Components
33. Heat Pumps

B. Part 2 Gas and Oil Forced Air and Hot Water Heating Systems

1. Fundamentals of Gas Combustion
2. Gas Furnace Controls and Components
3. Combustion Air
4. Vents and Chimneys
5. Gas Piping
6. Oil Furnaces
7. Hydronic Heating Theory
8. Mechanical Controls
9. Electrical Controls and Mechanical Components
10. Troubleshooting Hydronic Heating Systems Electrical Diagrams

C. Part 3 Electrical Theory and Application

1. Electrical Safety
2. Electrical Theory
3. Magnetism
4. Direct Current
5. Series Circuits
6. Parallel Circuits
7. Alternating Current
8. Power Distribution
9. AC Motors
10. Shaded Pole Motors
11. Split Phase Motors
12. Capacitor Start Induction Run (CSIR) Motor

13. Permanent Split Capacitor (PSC) Motor
14. Capacitor Start/ Capacitor Run (CSR) Motor
15. Three Phase Motors
16. Electrical Controls
17. Solid State Electronics
18. Wiring Layouts and Electrical Diagrams
19. Electrical Meters
20. Electrical Troubleshooting

D. Part 4 Airflow Components and Duct Fabrication

1. Airflow Tools and Measurements
2. Blowers and Fans
3. Air Duct Systems and Fabrication
4. Flexible (Flex) Duct
5. Fiberglass Ductboard
6. Air-Side Components
7. Air Filters
8. Humidifiers
9. Indoor Air Quality (IAQ) and Safety
10. Indoor Air Quality (IAQ)
11. Temperature, Humidity, and Psychometrics
12. Heat Gain Conduction and Radiant
13. Infiltration
14. Internal Heat Gain

IV. METHOD(S) OF INSTRUCTION

- A. Lecture
- B. Videos
- C. Class Discussions

V. REQUIRED TEXTBOOK(S)

Guide to NATE/ICE Certification Exams Robert Featherstone, Jesse Riojas (Current Edition)

VI. REQUIRED MATERIALS

None

VII. SUPPLEMENTAL REFERENCES

Handouts

VIII. METHOD OF EVALUATION

A. Exams 70%

B. Quizzes 30%

IX. ADA AA STATEMENT

Any student requiring special accommodations should inform the instructor and the Coordinator of Disability Support Services (Technology Center 101; phone 636-481-3169).

X. ACADEMIC HONESTY STATEMENT

All students are responsible for complying with campus policies as stated in the Student Handbook (see College website, <http://www.jeffco.edu>).

XI. ATTENDANCE STATEMENT

Regular and punctual attendance is expected of all students. Any one of these four options may result in the student being removed from the class and an administrative withdrawal being processed: (1) Student fails to begin class; (2) Student ceases participation for at least two consecutive weeks; (3) Student misses 15 percent or more of the coursework; and/or (4) Student misses 15 percent or more of the course as defined by the instructor. Students earn their financial aid by regularly attending and actively participating in their coursework. If a student does not actively participate, he/she may have to return financial aid funds. Consult the College Catalog or a Student Financial Services representative for more details.

XII. OUTSIDE OF CLASS ACADEMICALLY RELATED ACTIVITIES

The U.S. Department of Education mandates that students be made aware of expectations regarding coursework to be completed outside the classroom. Students are expected to spend substantial time outside of class meetings engaging in academically related activities such as reading, studying, and completing assignments. Specifically, time spent on academically related activities outside of class combined with time spent in class meetings is expected to be a minimum of 37.5 hours over the duration of the term for each credit hour.