WASHTENAW COMMUNITY COLLEGE
COURSE-SYLLABUS APPROVAL FORM (CSAF)

APP 232

SECTION I. SUBMISSION INFORMATION

1. Course:
Discipline/No: APP 232 **Title:** Theory & Operation of Heating Equipment **Start Term** W03

Division Code: HAT Department Code: CIND Org #: 14725 Don't publish: ☒ in College Catalog ☒ in Time Schedule ☒ on Web Page

2. Type of Approval:
- ☒ Full Approval
- ☐ Conditional Approval

☐ This proposal previously received conditional approval for the term: _____

3. Reason for Submission: This Course is being submitted for: (check all that apply)
- ☐ New Course Approval
- ☒ Five-year Syllabus Review ☐ No changes to course
- ☒ Major Change(s)
- ☐ Minor Change(s)*
- ☐ Reactivation of Inactive Course
- ☐ Inactivation

*If requesting a change to a course that has conditional approval, please submit a complete syllabus.

4. Change Information:

Minor Changes
- ☐ Course Discipline/Number (was _____)
- ☐ Course Title (was _____)
- ☐ Course Description
- ☐ Class Capacity (was: ____)
- ☐ Pre or Co-requisites
- ☐ Course Objectives (minor changes)
- ☐ Distribution of Contact Hours (contact hours were: lect: _____ lab _____ clin _____ other _____)
- ☐ Other _____

Major Changes
- ☒ Credit hours (credits were: 04)
- ☐ Change in Grading Method
- ☐ Total Contact Hours (total contact hours were: _____)
- ☐ Approval for offering an Honors Section
- ☐ Approval for offering Distance Learning Sections
- ☐ General Education Distribution Course: Add ☐ Remove ☐
- ☐ Pre or Co-requisites (that affect other departments)

5. Rationale Changes are are being made in response to data from Assessment: yes ☐ no ☐

Align credit hours with local 190 third party billing and payment requirements.

SECTION II. SIGNATURES

1. Department Review

Will any new resources be required? No, none anticipated ☒ Yes ☐
You must consult all departments that may be affected by this course. List departments contacted below and attach relevant documents.

Does the department support approval of this course? ☒ yes ☐ no

Print: Scott Klapper (Faculty/Preparer) Signature Scott Klapper Date: 10-15-02

Print: Scott Klapper (Department Chair) Signature Scott Klapper Date: 10-15-02

2. Division Review

Is this a curricular priority for your division? ☒ yes ☐ no (Comment _____)
What is the estimated enrollment? _____

Recommendation ☒ Yes ☐ No _____ (Dean's Signature) Date 10/16/02

3. Curriculum Committee Review

Recommendation ☒ Yes ☐ No Ruth A. Hatcher (Curriculum Committee Chair's Signature) Date 3.20.03

4. Vice President for Instruction and Student Services Approval

Approval ☒ Yes ☐ No _____ (Executive Vice President's Signature) Date 3/24/03

ACS Code _____ Entered in Banner 3/27 Entered in Access 3/27 Log File 3/27 fn

Approved for General Education Area/Group _____ Syllabus Date 200201

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SECTION III. COURSE SYLLABUS

A. COURSE DETAILS

Discipline & No.: APP 232 **Title:** Theory & Operation of Heating Equipment

1. **Description:**

This course will enable students to understand the theory and operation of heating equipment. This couse will enable students to understand maintaining comfort conditions. It will teach how heat is delivered. heating fuels and hydronic heating components. This course will enable students to understand power burners. This course will enable students to understand electric heating coils.

2. Credit Hours: 03

If Variable credit, Give Range: _____ to _____ credits

If repeatable for credit, how many times _____

3. Contact Hours per Semester:

Lecture: 30
Lab: 30
Clinical: _____
Other: _____
Total Contact Hours: 60

4. Class Capacity: 24

5. Course Options:

☐ Distance learning
☐ Honors
☐ P/NP Grading

6. Prerequisite(s)

and/or	"("	Course	Min Grade	*Concurrent Enrollment	Test Name	Min. Score	")"	**Level I II
		APP 111		☐				☐☐
☐☐		APP 112		☐				☐☐
☐☐		APP 113		☐				☐☐
☐☐				☐				☐☐
☐☐				☐				☐☐
☐☐				☐				☐☐
☐☐				☐				☐☐
☐☐				☐				☐☐

Other Prerequisites

Consent Required ☐

7. Corequisites:

8. Course Purpose:

☒ Program Requirement
☐ General Education
☐ Program Support
☐ Basic Skills/Developmental
☐ Transfer
☐ Industry/Professional Dev
☐ Enrichment

If a program requirement, specify the program(s)

Local 190 apprenticeship program

Please send syllabus for Transfer evaluation to:

☐ EMU
☐ UM

Accepted for transfer:

☐ EMU
☐ UM

9. Terms Course will be offered:

Terms	Session Length (e.g. 15 weeks, 1st 7½ weeks, etc.)	Day	Eve	Even years only	Odd years only
☒ Fall	15 weeks	☐	☒	☐	☐
☒ Winter	15 weeks	☐	☒	☐	☐
☒ Spr/Summer	15 weeks	☐	☒	☐	☐

B. MAJOR INSTRUCTIONAL UNITS

1. Theory and Operation of Heating Equipment
2.
3.

C. INSTRUCTIONAL OBJECTIVES

Unit #1 Theory and Operation of Heating Equipment

The student will:

1. Describe how to maintain comfort conditions
2. Describe how heat is delivered
3. Describe continuous and intermittent heat
4. Describe combustion chemistrt, carbon, oxygen, hydrogen, and sulfur
5. Describe proper venting of flue gas
6. Describe how to measure combustion levels
7. Describe heating fuels
8. Describe hydronic heating components
9. Describe advanced forced air heating
   counterflow
   upflow
   downflow

10. Describe how forced air works and its controls
11. Describe how hydronic heating works
12. Describe how to set up and oil burner
13. Describe how to clean and oil burner
14. Describe properties of oil
15. Describe safety with oil
16. Describe power burners
    how to trouble shoot
    gas tranes and block and bleed
    proportional burners and warp plate adjusting
    combustion analyzing
    safety
    burner controls
    flame rectification
    flame safegard

17 Describe electric heating coils
    airflow requirements
    sizing heating elements
    electrical heating safety

D. INSTRUCTIONAL METHODS, EVALUATION CRITERIA, AND ASSESSMENT

1. Instructional Methods:

☒ Lecture/Discussion	☐ Performances
☐ Clinical Instruction	☐ Group Critiques
☒ Laboratory Assignments	☐ Field Trips
☐ Internet Assignments	☐ Telecourse
☐ Computer Simulations	☐ ITV Course
☐ On-Site Work Experience	☐ Self-Paced Instruction
☐ Team Assignments	☐ Other
☐ Demonstrations	☐ Other

2. Evaluation Criteria:

☒ Attendance	☒ Quizzes
☒ Class Discussion	☒ Tests
☒ Papers	☐ Midterm
☐ Portfolios	☒ Final Exam
☐ Projects	☐ Presentations
☐ Reports	☐ Individual Performance
☐ Clinical Assignments	☐ Group/Team Performance
☒ Home Work	☐ Other

3. Assessment of Student Achievement:

☐ Departmental Exam	☐ Pre-test/Post-test
☐ Follow-on Tracking	☐ Simulations
☐ Standardized Test	☐ Comprehensive Project
☐ Portfolio Assessment	☐ Other

F. EQUIPMENT, FACILITIES, TEXTS, MATERIALS, AND SUPPLIES

1. Special Equipment/Facilities :

☒ Lab equipment	☐ ITV Classroom
☒ Computer Lab	☐ Off-Campus Sites
☒ CD ROM's	☐ Testing Center
☒ Data Projector/Screen	☒ Other Supplied by Local 190
☒ VCR	☐ Other
☒ TV Monitor	☐ Other

2. Texts:

Title: UA materials supplied by local 190
Author: United Association Copyright Yr:
Publisher: Est. Cost:

Title:
Author: Copyright Yr:
Publisher: Est. Cost:

Title:
Author: Copyright Yr:
Publisher: Est. Cost:

Title:
Author: Copyright Yr:
Publisher: Est. Cost:

Additional Texts:

3. Supplies and/or Uniforms students will have to Acquire: (e.g. calculators, uniforms, tools, etc.)

Descriptions	**Cost Estimates**

4. Reference Materials that will be used: (e.g. journals, books, manuals, maps, LRC reserves, etc.)

Title/Name	**Location**

5. Computer Software that will be used:

Title/Name	**Location**

6. Audio/Visual Materials that will be used: (e.g. films, video tapes, slides, audio tapes, CDs, etc.)

Title/Name	**Location**