WASHTENAW COMMUNITY COLLEGE
COURSE-SYLLABUS APPROVAL FORM (CSAF)

APP 222

SECTION I. SUBMISSION INFORMATION

1. Course:
Discipline/No: APP 222 **Title:** Heating Science **Start Term** F02

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: [illegible]

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 ☐

Reduce # of credit hours from 4 to 3

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: Patricia Crider Faculty/Preparer Signature [signature] Date: 8/6/02

Print: _____ Department Chair Signature _____ Date: _____

2. Division Review

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

Recommendation ☒ Yes ☐ No [signature] Dean's Signature Date 9/27/02

3. Curriculum Committee Review

Recommendation ☒ Yes ☐ No Ruth S. Hatcher Curriculum Committee Chair's Signature 9.12.02 Date

4. Vice President for Instruction and Student Services Approval

Approval ☒ Yes ☐ No [signature] Executive Vice President's Signature [illegible] Date

ACS Code _____ **Entered in Banner** 9/27/02 **Entered in Access** 9/23/02 **Log File** 9/23/02

Approved for General Education Area/Group _____ **Syllabus Date** 2002-09

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SECTION III. COURSE SYLLABUS
A. COURSE DETAILS

Discipline & No.: APP 222 **Title:** Heating Science

1. **Description:**

This course will introduce students to energy and heat relationships. Major topics include: heat transfer, insulation, measuring temperature, Centigrade and Fahrenheit scale; British thermal units; pressure; thermal conductivity; transfer; coefficient; and heating fuels. An in-depth review of types of heating will be discussed and includes: hydronic heating, radiant heating, forced air heating, convection heating, direct fired heating, solar heating, conduction heating, electric heating, basic combustion and controls, oil fired and gas fired heating systems.

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	**Level II
			☐				☐	☐
☐	☐		☐				☐	☐
☐	☐		☐				☐	☐
☐	☐		☐				☐	☐
☐	☐		☐				☐	☐
☐	☐		☐				☐	☐
☐	☐		☐				☐	☐
☐	☐		☐				☐	☐

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. Heating Science

C. INSTRUCTIONAL OBJECTIVES

Unit #1 Heating Science

The student will describe, define and demonstrate an understanding of:

1. energy and heat relationships
2. heat transfer
3. insulation
4. measuring temperature
5. the centigrade and Fahrenheit scale
6. btu, British thermal units
7. pressure
8. thermal conductivity
9. transfer coefficient
10. heating fuels
11. introduction to:
12. hydronic heating
13. forced air heating
14. convection heating
15. direct fired heating
16. solar heating
17. conduction heating
18. electric heating
19. basic combustion and controls
20. oil fired
21. gas fired
22. flame chemistry
23. btu content
24. atomizing and power burners
25. safety
26. gas valves
27. fuel orifices
28. pressure regulators
29. combustion gas testing

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
☐ VCR	☐ Other
☐ TV Monitor	☐ Other

2. Texts:

Title: UA material supplied by local 190
Author:_____ 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**

Course: APP 222

Title: Heating Science

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Outline:

1. Energy and heat relationships
2. Heat transfer
3. Insulation
4. Measuring temperature
5. Centigrade and Fahrenheit scale
6. BTU- British thermal units
7. Pressure
8. Thermal conductivity
9. Transfer coefficient
10. Heating fuels
11. Types of heating systems