



CMHE

A Guide to the Certified Master HVAC Educator Core Exam

Table Specifications and Resource Material
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Introduction

This document contains: 1) a Table of Test Specifications – Short Form for the CMHE exam that gives a quick overview of the major content areas of the test, 2) a Table of Test Specifications – Expanded Information for the CMHE exam that gives an in depth view of the test content, 3) a Sample set of questions to show how the question and answers are formatted, and 4) Suggested Resource Materials that might be used to study for the exam.

Please note that none of the Sample Questions will be the same as those on the test and that the section on Suggested Resource Materials should be viewed as a possible, but not a sole, source of information that might be used to supplement or codify a person’s knowledge regarding teaching.

Table of Test Specifications – Quick View

| | |
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| Number of Questions on the Exam: | 50 |
| Number to Duty Categories: | 5 |
| Required Completion Rate for Certification: | 80% |

| Percentage Of Test | Duty Areas To Be Tested |
|--------------------|---------------------------------|
| 10% | Attribute |
| 20% | Learning Environment |
| 20% | Instructional Planning |
| 30% | Instructional Management |
| 20% | Evaluation |

(See expanded version for more information.)

Sample Questions

Note: Answers are marked with an *.

| Duty Area | Sample Question |
|---------------------------------|--|
| Attribute | Occupational instructors need updated information about current educational practice. Educational research guides much of the practice in the teaching profession. Educational research information can be found through <ul style="list-style-type: none"> A. colleges citations B. ERIC * C. educational journals D. occupational periodicals E. ASCD |
| Learning Environment | A well-stocked laboratory adds to a good instructional environment. Which of the following is the best inventory management technique? <ul style="list-style-type: none"> A. all material is ordered at the beginning of every year B. all material is replaced at the end of the year C. bins are labeled for the quantity of material and inventoried the end of every semester D. material use is reviewed and compared from year to year * E. items are replaced as soon as they are used |
| Instructional Planning | Long and short term goals are developed for an instructional set. Which is an example of a long term goal? <ul style="list-style-type: none"> A. Students will emulate industry accepted practices. * B. Students will demonstrate industry accepted attendance policies. C. Students will identify similar devices on other machines. D. Students will use similar troubleshooting logic in each lab example. E. Students will select the prescribed tool for a given task. |
| Instructional Management | An occupational lecture room needs to be <ul style="list-style-type: none"> A. a quiet room with blank walls for projection B. a lecture room filled with multimedia equipment C. apart from but close to the technical laboratory * D. a room that is filled with occupationally specific devices and images E. a multi-purpose room used by many different courses |
| Evaluation | Students should receive information about the completion of program goals through which of the following means? <ul style="list-style-type: none"> A. instructor feed back * B. course grade reports C. test results D. the advisory committee E. program advisors |

Table of Test Specifications - Expanded View

| Percentage /Questions | Duty | Task | Element |
|---|---|---|---|
| Percent relationship to the entire test / the number of questions asked on the test per duty category . | Major duty categories within the job of technical teaching. | Subsection or breakdown within each major duty category. There may be several to many tasks that comprise a single duty category. | An element is a single or multiple focus area within a task. If there is a sequence to the task, these are sometimes referred to as steps to a task. |
| 10%/5 | Attribute | | |
| | | 1. Engages and supports learning. | <ul style="list-style-type: none"> • Differentiates between situations where listening and interpretation of student comments is important. |
| | | 2. Studies teaching practice. | <ul style="list-style-type: none"> • Identifies learning theory. |
| | | 3. Familiar with research in education. | <ul style="list-style-type: none"> • Identifies ERIC. |
| | | 4. Establishes personal professional goals. | <ul style="list-style-type: none"> • Differentiates personal goals. |
| | | 5. Continues to attend educational seminars. | <ul style="list-style-type: none"> • Identifies educational seminar topics. |
| | | 6. Works with colleagues to improve teaching. | <ul style="list-style-type: none"> • Identifies collaborative activities. |
| | | 7. Works with other educational stakeholders to improve or communicate educational initiatives. | <ul style="list-style-type: none"> • Identifies other stakeholders in the educational process (parents, guardians, spouses, etc.) |
| | | 8. Maintains membership in an occupational association. | <ul style="list-style-type: none"> • Identifies occupational associations. |
| | | 9. Maintains membership in an educational association. | <ul style="list-style-type: none"> • Identifies educational associations. |
| 20%/10 | Learning Environment | | |
| | | 1. Creating a facilitating physical environment. | <ul style="list-style-type: none"> • Differentiates between good and bad environmental settings. |
| | | 2. Maintaining a climate of fairness & respect. | <ul style="list-style-type: none"> • Differentiates between good and bad classroom rules. • Differentiates between good and bad classroom dialog. |
| | | 3. Promotes acceptable dialog and questioning approaches. | <ul style="list-style-type: none"> • Identifies socially or occupationally acceptable dialog. |
| | | 4. Promoting social and | <ul style="list-style-type: none"> • Discriminates good and bad industry |

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| | | industry representative behavior. | behaviors |
| | | 5. Allows for individual time with students. | <ul style="list-style-type: none"> Identifies how to manage office hours to meet student needs. |
| | | 6. Maintains a library of resource material. | <ul style="list-style-type: none"> Identifies methods to manage resource material. Identifies types of material used for resources. |
| | | 7. Develops classroom and laboratory procedures. | <ul style="list-style-type: none"> Identifies classroom and laboratory management techniques. |
| | | 8. Maintains occupationally related laboratory equipment. | <ul style="list-style-type: none"> Identifies components of a laboratory maintenance program. |
| | | 9. Manages tools and inventory. | <ul style="list-style-type: none"> Identifies methods to track tools. Identifies methods to manage inventory. |
| | | 10. Affectively using the instructional time allotted. | <ul style="list-style-type: none"> Differentiates between good and bad use of time. |
| 20%/10 | Instructional Planning | | |
| | | 1. Demonstrating knowledge and technical skill within the occupation. | <ul style="list-style-type: none"> Distinguishes depth and flexibility of knowledge and skill. |
| | | 2. Designs long and short term instructional activities. | <ul style="list-style-type: none"> Differentiates between long and short term activities. |
| | | 3. Develops lesson plans. | <ul style="list-style-type: none"> Identifies components of a lesson plan. |
| | | 4. Organizing content for student understanding. | <ul style="list-style-type: none"> Orders content based on student understanding. |
| | | 5. Selects delivery methods based on the learning ability of students. | <ul style="list-style-type: none"> Identifies "learning styles" or "intelligences" as it applies to student learning. |
| | | 6. Incorporates resource materials. | <ul style="list-style-type: none"> Identifies sources for resource material. |
| | | 7. Using various instructional strategies. | <ul style="list-style-type: none"> Identifies different instructional strategies (demonstration, lecture, simulation, etc.) Identifies apprenticeship models. Identifies job shadow situations. Identifies internship situations. |
| | | 8. Incorporating materials, equipment, and instructional resources. | <ul style="list-style-type: none"> Identifies where instructional equipment and resources can be used within a lesson. |
| | | 9. Involves members of the occupation in learning activities with students. | <ul style="list-style-type: none"> Identifies where guest speakers and occupational immersion can be incorporated. |
| | | 10. Integrates academic and occupational knowledge and skill | <ul style="list-style-type: none"> Identifies or links academic learning and occupational skill within a lesson. |
| 30%/15 | Instructional Management | | |
| | | 1. Draws on prior experience of students. | <ul style="list-style-type: none"> Identifies where student experience will enhance a lesson. |
| | | 2. Presents goals & objectives | <ul style="list-style-type: none"> Identifies where goal and objective |

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| | | to be met. | information is delivered. |
| | | 3. Develops sequential activities to build upon previous knowledge and skill. | <ul style="list-style-type: none"> Sequences learning activities in a lesson. |
| | | 4. Writes instructional objectives. | <ul style="list-style-type: none"> Identifies the components of an objective statement. |
| | | 5. Employs various teaching strategies or methods to achieve student learning. | <ul style="list-style-type: none"> Distinguishes between strategies/methods and non-strategies/methods. |
| | | 6. Uses various approaches to facilitate learning for the disabled. | <ul style="list-style-type: none"> Identifies techniques to meet the learning needs of the disabled. |
| | | 7. Meets national, state, and/or occupational goals and objectives. | <ul style="list-style-type: none"> Identifies national goals. |
| | | 8. Modifies instructional plans to meet student needs. | <ul style="list-style-type: none"> Selects components of the lesson plan to be modified. |
| | | 9. Incorporates occupational immersion models. | <ul style="list-style-type: none"> Identifies various occupational immersion models (internship, apprenticeship, job-shadow, cooperative experience). |
| | | 10. Involves the advisory committee with the initiatives of the instructional program. | <ul style="list-style-type: none"> Identifies areas of interest for advisory committee members. |
| | | 11. Uses generic application programs; word processors, spreadsheets, & presentation programs. | <ul style="list-style-type: none"> Identifies components of application programs. |
| | | 12. Uses the overhead projector. | <ul style="list-style-type: none"> Distinguishes between good and bad use of the overhead. |
| | | 13. Incorporates digital images in presentations. | <ul style="list-style-type: none"> Identifies how digital images are added to a presentation. |
| | | 14. Uses demonstration techniques in presentations. | <ul style="list-style-type: none"> Identifies situations where technology is used in demonstration presentations. |
| | | 15. Incorporates simulations in presentations. | <ul style="list-style-type: none"> Identifies how technology is used in simulations. |
| | | 16. Delivery methods involve the use of materials and/or methods. | <ul style="list-style-type: none"> Distinguishes between good and bad use of material in presentations. |
| | | | |
| 20%/10 | Evaluation | | |
| | | 1. Communicates learning goals and objectives. | <ul style="list-style-type: none"> Identifies where goals and objectives are announced for evaluation purposes. |
| | | 2. Collects evaluative information to use for intervention activities (if necessary). | <ul style="list-style-type: none"> Identifies assessment activities that will produce a balanced report for learners. |
| | | 3. Observes and evaluates the overall classroom atmosphere. | <ul style="list-style-type: none"> Identifies good and bad educational environments. |

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| | | 4. Communicates goals and objectives with other stakeholders (parents, school officials, advisory members, etc.). | <ul style="list-style-type: none"> Identifies stakeholders Identifies methods of communication. |
| | | 5. Involves learners in determining their own learning progress. | <ul style="list-style-type: none"> Identifies methods used to self-evaluate. |
| | | 6. Conducts accumulative performance assessment activities. | <ul style="list-style-type: none"> Identifies performance assessment methods. Identifies components of performance assessment. Identifies challenges to performance testing. |
| | | 7. Conducts written evaluations. | <ul style="list-style-type: none"> Identifies types of written assessments. Identifies the components of Multiple-Choice tests. Identifies where types of written assessment can be used best. |
| | | 8. Provides evaluation “feedback” information to students. | <ul style="list-style-type: none"> Identifies methods to provide feed back to students. |
| | | 9. Meets national, state, and occupational objectives. | <ul style="list-style-type: none"> Identifies methods to report national, state, and occupational objective attainment. |
| | | 10. Involves the advisory committee in the evaluation system. | <ul style="list-style-type: none"> Identifies ways that the advisory can be involved in evaluation activities. |
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Suggested Resource Materials

Note: Text materials change continually. There are always new materials being produced and research conducted within education. NONE of the following materials are endorsed as sole sources of information on the subject of teaching. However, these materials are examples of material available at the time the CMHE exam was created. While it is always best to obtain the most recent information on a subject, there are many older and out of print books that are good and relevant resources for the categories examined in this test.

General & Online Resources

Note: The following are general resources and organizations that may house additional information on subjects covered in this exam.

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| Teachers.NET | http://www.teachers.net |
| General Websites for Teachers | http://www.sitesforteachers.com |
| NCCTE “National Center for Career and Technical Education” | http://www.nccte.com |
| ERIC “Education Research Information Center” | http://www.eric.ed.gov |
| ASCD “American Society for Curriculum and Development” | http://www.ascd.org |
| ASTD “American Society for Training and Development” | http://www.astd.org |
| APA “American Psychological Association” | http://www.apa.org |

Text Resources

| Book Title | Author | Description | Publisher/ Date |
|---|--|--|--|
| Attributes | | | |
| Teacher Quality: Understanding the Effectiveness of Teacher Attributes | Jennifer King Rice | Teacher quality is the single most important school-related factor influencing student success. In <i>Teacher Quality: Understanding the Effects of Teacher Attributes</i> , author Jennifer King Rice examines the body of research on the subject of teacher quality to draw conclusions about which attributes makes teachers most effective, with a focus on aspects of teacher quality that can be translated into policy recommendations and incorporated into teaching practice. | Economic Policy Inst; (August 25, 2003) |
| Seven Steps to Effective Instructional Leadership | Elaine K. McEwan | After an introduction on critical attributes of effective instructional leadership, chapters describe seven steps for effective instructional leadership, set forth behavioral indicators related to each step, and offer practical suggestions from actual principals on implementing the seven steps. This second edition includes material on standards-based reform and the use of data to drive school improvement | SAGE Publications Pub. Date: August 2002 |
| Learning Environment | | | |
| Theoretical Foundations of Learning Environments | David H. Jonassen, Susan M. Land | This text covers issues focusing on the theoretical foundations of learning environments. It includes: conceptions and misconceptions of student-centered learning environment; situated cognition in theoretical and practical context; and distributed cognitions, by nature and by design. | Lawrence Erlbaum Associates September 20 00 |
| Changing the School Learning Environment: Where Do We Stand after Decades of Reform? | Jack Rimmel Frymier | (synopsis not available) | Rowman & Littlefield Publishers, Inc. June 2004 |
| Enhancing Professional Practice: A Framework for Teaching | Charlotte Danielson | For the development of top-notch rubrics for excellent teaching. Every educator should own this book. | Association for Supervision & Curriculum Development November 19 96 |
| Instructional Planning | | | |
| What Every Teacher Should Know About Instructional Planning | Donna E. Walker Tileston | "The essential guide to lesson planning in the standards-based classroom." Based on state-of-the-art research, this guide will take you from pre-planning through reflection, evidence of learning, and teaching for transfer to real-life situations | SAGE Publications |
| Planning Programs for Adult Learners: A Practical Guide for Educators, Trainers, and Staff Developers, 2nd Edition | Rosemary S. Caffarella, Malcolm S. Knowles | This guide and resource book offers assistance for those planning adult education and training programs. Based on an interactive model of program planning, the book discusses the context of training, the need for support, formats, schedules, staff needs, budgets, marketing, and facilities. It also details the process, offering guidance concerning the identification of program ideas, prioritizing, developing program objectives, the design of instructional plans, evaluation, recommendations, and the communication of results. Caffarella teaches educational leadership and policy at the University of Northern Colorado. Annotation c. Book News, Inc., Portland, OR (booknews.com) | Wiley, John & Sons, Incorporated November 20 01 |
| Writing Instructional Objectives for Teaching and | Norman Gronlund, Nivaldo J. | Provides a step-by-step guide to writing instructional objectives as intended learning outcomes. The author describes how to state objectives in terms of the type of | Prentice Hall March 2003 |

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| Assessment | Tro | performance students must demonstrate in order to show that they have achieved the goals of the instruction | |
| Instructional Management | | | |
| Key Elements of Classroom Management: Managing Time and Space, Student Behavior, and Instructional Strategies | Joyce McLeod, Jan Fisher, Ginny Hoover | Three veteran teachers show how teachers can make real improvements in their classroom by concentrating on basic skills in three critical areas: Managing Time and Space, Managing Instructional Strategies, and Managing Student Behavior | Association for Supervision & Curriculum Development August 2003 |
| The Accelerated Learning Handbook: A Creative Guide to Designing and Delivering Faster, More Effective Training Programs | Dave Meier | Provides an overview of the background and underlying principles of accelerated learning, and reviews the latest supporting research results Improve the long-term value of training Cut course development time by half Discover tips for music- and computer-based learning | McGraw-Hill Companies June 2000 |
| Instructional Leadership: A Learning-Centered Guide | Anita Woolfolk Hoy, Wayne K. Hoy | Written for school principals, this text introduces current theories of teaching and learning in order to encourage and facilitate teacher- principal cooperation. Chapters review current research and theory in the areas of student differences, learning, student motivation, teaching, classroom management, assessing student learning, and assessing and changing school climate and culture. Suggestions for applications of theory are included in the material. | Allyn & Bacon, Inc May 2002 |
| Evaluation | | | |
| The Program Evaluation Standards: How to Assess Evaluations of Educational Program | James R. Sanders | Presents, explains, and illustrates 30 standards, compiled by The Joint Committee on Standards for Educational Evaluation, aimed at providing a guide for evaluating educational and training programs, projects, and materials in a variety of settings. | SAGE Publications January 1994 |
| Program Evaluation: Alternative Approaches and Practical Guidelines | Jody L. Fitzpatrick, Blaine R. Worthen, James R. Sanders | Provides an overview of a wide variety of approaches to evaluation and extensive practical guidelines for carrying out evaluation studies successfully. This text helps both students and professionals who are new to evaluation to understand how the field has evolved, what different approaches an evaluator can take in conducting evaluations, and how to plan and conduct an evaluation. The text makes extensive use of checklists, examples, and a comprehensive case study. Finally, throughout the book, students are introduced to current trends and controversial issues in evaluation and ways to conduct evaluations in an ethical and professional manner | Pearson August 2003 |