



This workforce solution was funded by a grant awarded under Workforce Innovation in Regional Economic Development (WIRED) as implemented by the U.S. Department of Labor's Employment and Training Administration. The solution was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership. This solution is copyrighted by the institution that created it. Internal use by an organization and/or personal use by an individual for non-commercial purposes is permissible. All other uses require the prior authorization of the copyright owner.

Certification Development Overview



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Funding provided by Department of Labor, Employment & Training Administration: WIRED Initiative

The Society of Manufacturing Engineers Current Portfolio of Certifications

- ◆ Certified Manufacturing Technologist – CMfgT
- ◆ Certified Manufacturing Engineer - CMfgE
- ◆ Certified Engineering Manager – CEM
- ◆ Certified Enterprise Integrator - CEI



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LEAN™

certification



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Certification Development Overview

- ◆ Pre–Development
- ◆ Development
 - ◆ Role Delineation
 - ◆ Body of Knowledge
 - ◆ Exam Item Writing & Review
 - ◆ Exam Build
 - ◆ Exam Evaluation
- ◆ Launch
- ◆ Continuous Improvement, Development & Maintenance



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Pre-Development

- ◆ **Concept Development**
- ◆ **Recruit Committee Members & Subject Matter Experts**
- ◆ **Initial Proposal of Certification Concept**
- ◆ **Preliminary Role Delineation**
- ◆ **High-Level Body of Knowledge**
- ◆ **Qualitative Concept Assessment**
- ◆ **Hurdle Rate – preliminary validation**
- ◆ **Volunteer Recruitment & Engagement Plan**



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Role Delineation

- ◆ Define the target certification candidate(s).
- ◆ What is it that they do?
- ◆ What skills and knowledge do they need to possess?



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Body of Knowledge

- ◆ **Topical outline of the skills and knowledge that a qualified certification candidate should be competent in.**
- ◆ **Built buy industry expert volunteers.**
- ◆ **Quantitatively and qualitatively validated before exam development starts.**
- ◆ **Weighted by module.**
- ◆ **Reference materials identified and mapped to the body of knowledge.**



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Exam Item Writing & Review for Validity, Reliability, Fairness & Legal Defensibility

- ◆ The SME certification item and examination development process is based upon a number of national guidelines and standards, developed and administered by such groups as:
 - ◆ Council on Licensure, Enforcement, and Regulation.
 - ◆ National Organization of Competency Assurance.
 - ◆ American Psychological Association.
 - ◆ National Council on Measurement in Education.
 - ◆ National Council of Examiners for Engineering and Surveying.
 - ◆ Council of Engineering Specialty Boards.
 - ◆ Association of Boards of Certification.
 - ◆ Educational Testing Service.
 - ◆ American College Testing.
 - ◆ Professional Examination Service.



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Exam Build

- ◆ **Begins after a pool of exam items has been reviewed and accepted by industry content expert volunteers.**
- ◆ **Items for each topic are prioritized for exam inclusion.**
- ◆ **Item inclusion is weighted based on the body of knowledge requirements.**
- ◆ **Set initial passing score.**
- ◆ **Items not included in the exam may be used for a self–assessment or practice exam.**



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Exam Evaluation

- ◆ **“Testing” the test to evaluate the exam composition (2 rounds)**
- ◆ **Adjustments/improvements are made after each round**
- ◆ **Final passing score is determined as a result of the “testing”**



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Launch

- ◆ **Program is open to qualified candidates.**
- ◆ **Requirements and application are available.**
- ◆ **Exam is launched.**
- ◆ **Supporting materials are introduced over time.**



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Continuous Improvement, Development & Maintenance

- ◆ Migration from development team to an Certification Oversight & Appeals Subcommittee comprised of volunteers with requisite knowledge and expertise from industry and academia.
- ◆ Periodic validation of the Body of Knowledge (research based)
- ◆ Annual evaluation of exam performance
- ◆ Annual adjustments to the exam



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Power of Volunteers

- ◆ Traditional certification development: 3 year process
- ◆ High engagement of volunteers working on development: 18–24 months*

****Direct participation and commitment of a significant number of volunteers can dramatically reduce the time it takes to develop a certification!***



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