

ATMAE CERTIFICATIONS OVERVIEW

Succinctly describe ATMAE and who ATMAE serves

ATMAE membership includes students and professional members at more than 500 companies, community colleges, and universities throughout the U.S. that are interested in promoting and supporting the ATMAE mission to set standards for academic program accreditation, personal certification, and the professional development for educators and industry professionals involved in integrating technology, leadership, and design.

How is the certification relevant to students in four-year bachelor's degrees? How did ATMAE develop the job task analysis and exam blueprint for the certification exam? For example, did ATMAE work with employers, how? Did ATMAE work with professions in manufacturing education, how?

Certification exam development

Presently, the ATMAE Certification Board is developing exams under the guidelines established by the American National Standards Institute (ANSI). The process used by ANSI to accredit certification bodies is based on an international standard (ISO/IEC 17011). Adherence to a rigorous internationally recognized accreditation process ensures that the ANSI process conforms to the highest accreditation standard and represents the best practices in accreditation. ANSI is the only personal certification accreditation body in the United States to meet nationally accepted practices for accreditation bodies.

Job Analysis

The first step in creating any professional certification that is used to certify individuals nationally and/or internationally is to make a list of all the tasks, skills, knowledge, and other requirements needed to successfully perform the job in which the certification is documenting. Input from individuals who currently perform that job or manage, supervise, train, and/or educate individuals for that particular job must give their input to create a credible certification. These subject matter experts (SMEs) must represent regions from across the country for national certifications and from across the globe for international certifications. In addition, if a certification can apply to small, medium, and/or large companies, then the SMEs must consist of individuals from a cross section of organizations.

Survey

Once a job analysis is developed from the SMEs, the body of knowledge (BOK) to perform this job is listed in a survey upon which the respondents are required to rank them on a Likert-type scale ranging from 1 to 5 with a 5 being most important to the job while a 1 would denote not be important to the job. The survey is sent to industrial advisory board members from accredited programs who educate individuals for these jobs from across the country. There is also space at the end of the survey to allow respondents to add any overlooked content that may be important to the job. Any overlooked content is then placed on a mini survey instrument and sent to respondents for ranking as mentioned previously. Knowledge that is ranked with the highest number will be included on the exam and have the greatest amount of questions pertaining to it. In contrast, knowledge that had the lowest score will either be omitted or only have one question devoted to it on the exam.

Question Writing

Once the BOK and its importance are determined for the exam, questions are developed to measure the knowledge of the individual being certified. These exam questions are developed from members of the appropriate certification commission who are SMEs and also have a background in psychometrics with respect to test development. The multiple choice questions for the exam are developed with regard to the various levels of Blooms Taxonomy. In this fashion, examinees will not only have to know how to regurgitate common knowledge but also have to synthesize, and apply what they know to

answer questions. In other words, questions are developed to make the examinee problem solve and trouble shoot as they would have to on the job.

Testing the Exam

Once the draft exam is completed, it is sent to advisory board members from across the country that have real-life experiences associated with the job for which the certification is being developed. Feedback is collected from these board members and the exam is revised to reflect these changes. The exam is then beta tested by individuals who are educated for or currently work in the job. An item analysis as well as other statistical analyses is conducted on the beta exam data to improve the exam's validity and reliability. This process may be repeated several times until the exam is composed of questions that are statistically valid and reliable. Once the exam has content validity and reliability, it is then allowed to be made available for individuals to obtain a specific personal certification.

Exam Revisions

Each certification exam is revised from the data compiled from all of the examinees who took the exam throughout the past year. Statistical analyses are performed to determine which exam questions need to be revised and what the cut (passing) score should be. Exam versions may become harder or easier over the years so a number of exam questions are kept on the exam to measure how well examinees fared on these questions versus the new questions. If the new batch of examinees did approximately as well on the old questions as the previous group then they should fare approximately as well on the newly developed questions. If the examinees do not do as well or fare better on the new questions, then the cut score for the exam is raised or lowered accordingly.

Does ATMAE have any partnerships with four-year universities? If so, describe those partnerships.

ATMAE is composed of leaders from industry, four-year universities, two-year colleges, and students. The accreditation branch of ATMAE currently accredits technical programs from 59 universities. Many of the Certification Board members are from four-year universities. Furthermore, more than 50 universities use the ATMAE certifications to assist with the assessment of their programs for accreditation. Moreover, many of the faculty from these programs present papers on relevant research at the annual ATMAE conferences.

Why the certification was created and what have been some employer-recognized outcomes/impact of the certification?

In 1991, the ATMAE Certification Board was established to create professional certification programs for individuals in the technology management and applied engineering fields. Since that time, six certification programs have been developed and used to certify over a thousand individuals. An exam commission was formed for each certification program whose members consist of experts in that field from all across the country. In this way, content for a certification program is not specific to one geographic region.

Who attendees should contact if they are interested in learning more about ATMAE's certification and/or building pathways?

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ATMAE Certifications: Certified Manufacturing Specialist (CMS), Certified Technical Professional (CTP), Certified in Engineering Graphics (CEG), Certified Technology Manager (CTM), Certified Lean Six Sigma (CLSS) [Can earn yellow, green, black, and master black belts depending on exam grade and project], and Microelectro Mechanical Systems Foundation Certificate (MFC)