



Section 17

CERTIFIED ANALYTICS PROFESSIONAL (CAP) CERTIFICATION PROGRAM

Policies and Procedures

(Last updated October 2020)

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17.1 CERTIFIED ANALYTICS PROFESSIONAL (CAP) PROGRAM – ANALYTICS CERTIFICATION BOARD (ACB)

EFFECTIVE: OCTOBER 2012, OCTOBER 2020

INFORMS Certified Analytics Professional (CAP) Program is established to promote and advance the analytics profession by setting agreed upon standards for analytics and technical excellence. CAP provides a means for organizations to identify and develop qualified analytics professionals; and it enhances the careers of analytics professionals by promoting continued competence, improving the credibility of the analytics profession, and by improving the visibility of the analytics profession.

The CAP Program shall be overseen by the Analytics Certification Board (ACB), Certification Manager and the Director of Education and Industry Programs under the policies and procedures that follow.

I. POLICY

The Analytics Certification Board (ACB) oversees the Certification Analytics Professional program and is both the standard setting and assessment body for professionals in the analytics field. It is comprised of highly regarded analytics and operation research professionals. The ACB also helps ensure impartiality of the development and administration of the CAP Program.

Accordingly, ACB has the authority to make final decisions regarding program procedures, program content, and the eligibility requirements of applicants for certification. This is independent of input from the INFORMS governance, to include INFORMS Board of Directors, officers, Certification Manager or other professional staff members who are deemed necessary.

To increase the credibility of the certification, the ACB will serve without pay for their services and will refrain from serving as instructors for any course specifically designed as a CAP exam preparation course.

II. PROCEDURES

A. Governance

The ACB shall uphold rules, practices and policies that direct and manage the CAP program and help maintain the integrity and overall health of the program.

1. **Vision** - To advance the use of analytics by setting agreed upon standards for the profession.
2. **Mission** - To advance the analytics profession by providing a high-quality program of certification and promoting continuing competence for practitioners.
3. **Goals** - In accomplishing its mission, the Analytics Certification Board will work with the INFORMS Certification Manager to:
 - a) Help organizations identify and develop qualified analytics professionals.
 - b) Promote the use of best practices in the analytics profession.
 - c) Contribute to the career success of analytics professionals.
 - d) Improve the credibility of the analytics profession.
 - e) Improve the visibility of the analytics profession.
 - f) Engage in partnerships with organizations or commercial companies to further these goals.

B. *Organization of the ACB*

1. Composition

The ACB shall consist of a minimum of eleven (11) voting members as follows:

- a) Three (3) of the voting members will be ex officio INFORMS volunteer leaders including:
 - VP of Sections/Societies
 - VP of Practice
 - President of the Analytics Society
- b) The remaining at-large positions will, to the extent possible, include representation of the following:
 - Academia
 - Industry
 - Government, and
 - International organizations/agencies
- c) The ACB will strive, to the extent possible, to reflect the demographic diversity of the profession in its composition.
- d) The Executive Director, The Director of Education and Industry Programs, and the Certification Manager of INFORMS shall serve on the ACB in an ex officio non-voting capacity. In the absence of the Executive Director, the Certification Manager and/or Director of Education & Industry Programs shall stand in.
- e) Criteria for serving on the ACB may include, but is not limited to:
 - Active involvement in the analytics profession
 - Certification status (for at least 50% of the ACB)
 - INFORMS membership

2. Orientation for New Members of ACB

The ACB Chair and Certification Manager shall provide an appropriate orientation for new ACB members. Orientation information shall include but is not limited to: the ACB Policy and Procedures, CAP website and application procedures, a copy of the minutes of previous ACB meetings, and a description of the current state of the certification program.

3. Dismissal from the ACB

Except for the INFORMS ex officio positions, any at-large member of the ACB may be removed from office by at least a two-thirds vote of all ACB members for engaging in any conduct or behavior contrary to the best interests of the ACB or contrary to these policies and procedures (P&Ps). The ex officio positions on the ACB can only be removed by majority vote of the INFORMS Board of Directors. Any such action would leave that ex officio position vacant until a different person fills that role. Any person removed from service on the ACB is not eligible to serve on the ACB in the future.

4. Roles and Responsibilities of ACB Members and the Chair

- a) The role of the ex officio and membership-at-large members is as follows:
 - Review and recommend updates to certification program requirements
 - Vote on certification decisions

- Review discipline matters and policies
- Participate in ad hoc committees of the ACB (see II.C.1, *Committees*)
- Oversee the ongoing review and updating of the analytics certification examination(s)
- Identify and cultivate potential partnerships for the benefit of the certification program

b) The role of the Chair is as follows:

- Call meetings of the ACB
- Prepare agendas and preside at meetings
- Serve as an official spokesperson for the ACB
- Prepare reports summarizing the work of the ACB and submit to the INFORMS Board of Directors via the VP of Practice for reporting at the quarterly Board meetings
- Appoint members of the ACB ad hoc committees
- Vote only to break a tie

5. Terms of Office, Appointments, and Elections

a) Members

(1) Members of the ACB shall be appointed by the INFORMS Board of Directors and shall serve 3-year staggered terms. Thereafter, all positions other than the INFORMS ex officio representatives shall be elected by INFORMS members holding CAP[®] certifications.

(2) Members shall serve no more than two total consecutive terms. The term of the INFORMS ex officio voting representatives may be shorter or longer contingent upon their terms on the INFORMS Board.

(3) Terms of office shall be for a calendar year, January 1 to December 31, to conform with other INFORMS committees. Ex officio officers-elect may attend ACB meetings from their election so as to provide continuity.

(4) In the event a non ex officio member resigns from the ACB or is unable to complete an assigned term, a replacement member with appropriate qualifications shall be appointed by the ACB to fulfill the term.

(5) To continually assure that all stakeholders are represented on the ACB, it may become necessary to appoint members to the ACB without election, but with the stated approval of the ACB. Upon appointment, such members will function under current procedures with respect to the terms outlined in this section, II.F.1., *Terms of Office, Appointments, and Elections*.

b) Chair

The Chair shall be elected by the ACB and serve a one-year term. The Chair may serve up to two (2) consecutive one-year terms. The chair must have current or previous service as a member of the ACB.

c) Vice Chair

The Vice Chair shall be elected by the ACB and may serve up to two (2) consecutive one-year terms. The Vice Chair shall serve as the acting Chair of the ACB in the absence of the elected chair. The Vice Chair must have current or previous service as a member of the ACB.

d) Elections

At-large members of the ACB shall be elected by current INFORMS members holding CAP® or aCAP™ credentials. Written or electronic balloting is permitted. Candidates can be elected by a simple majority of all votes cast. Thirty (30) days written notice of an election must be given to all eligible credential holders. The INFORMS VP of Practice, an ex officio member of the ACB, shall collect nominations from and consult with the Nominating Committee to present a slate of candidates as a final ballot to those voting members in advance of the final meeting of the year (typically December).

Note: For chair and vice chair of the ACB, nominations shall be open to all current ACB members.

6. Certification Manager and Support Staff

- a) The Certification Manager shall be responsible for the day-to-day operations of INFORMS certification program and serves as the primary liaison to the ACB.
- b) Job descriptions will be prepared for all support staff citing their specific certification responsibilities.

7. Meeting Frequency and Quorum

- a) The ACB will meet quarterly and at least one time per year in a face-to-face meeting, preferably at the annual Spring Business Analytics Conference. Other required meetings may be held by teleconference.
- b) A simple majority of the ACB membership is required to transact business at face-to-face or teleconference meetings.

8. Relationship with INFORMS Board and Staff

The ACB will work with the INFORMS Certification Manager and the INFORMS Board of Directors to accomplish the mission of the certification program. This relationship will include:

- a) Developing and submitting an annual plan of goals for the INFORMS Board awareness and review per a schedule set forth by the Certification Manager.
- b) The Certification Manager soliciting input from the ACB during the development of the annual, proposed INFORMS budget to ensure proper inclusion into the INFORMS overall budget review and approval process.
- c) Preparing a quarterly report by the ACB Chair for the INFORMS Board meetings outlining the status of the certification program and reporting on changes, improvements and enhancements in this program.
- d) Operating within a budget approved by INFORMS.
- e) Working through INFORMS Certification Manager to engage the support of INFORMS subdivisions in support of the certification program.
- f) The ACB shall operate independently from the INFORMS Board of Directors with respect to certification application, testing and approval processes and procedures.

Note: The INFORMS Certification Manager will oversee the ongoing management of the certification program to ensure that certification operations, policies and procedures are compliant with applicable law and current best practices in professional certification.

9. Confidentiality and Conflicts of Interest

The ACB strives to minimize potential confidentiality and conflict of interest issues in all of its deliberations. All members of the ACB shall sign a Confidentiality and Conflict of Interest Statement that specifies requirements and expectations on these matters.

C. ACB OPERATIONS

1. Committees

The ACB shall develop standing and ad hoc committees as needed to achieve its mission and goals. Proposed certification committees can include, but are not limited to the following:

- a) Examination Committee: Shall consist of the Certification Manager, psychometrician, and 12-15 subject matter experts globally. The Examination Committee shall develop exams, review test items, update the item bank, and revise/update job task analysis as appropriate.
- b) Nominating Committee: Shall be chaired by the VP of Practice with at least two others to be selected by the VP of Practice to ensure diversity and stakeholder balance. Those eligible to serve on the committee are INFORMS members, majority of whom have CAP or aCAP credentials. It is not required that they are current members of the ACB.
- c) Executive Committee: Shall consist of the chair, vice chair, INFORMS VP of Practice (ex officio member) and others as deemed necessary to conduct the operational and strategic work of the ACB.

2. Review of Assessment Standards, Policies and Procedures

The Certification Manager will conduct an annual review of certification program policies and procedures as well as all examination requirements and tasks to determine whether current policies and procedures continue to meet the needs of the certification program and are compliant with best practices in professional certification. Any changes proposed in the policies and procedures must be approved by the Executive Committee and the INFORMS Board of Directors. All other changes related to standards and requirements must be approved by a simple majority vote of the ACB. A summary of all accreditation audits will be shared periodically with the ACB.

17.2 CERTIFIED ANALYTICS PROFESSIONAL (CAP) PROGRAM – INFORMS

EFFECTIVE: OCTOBER 2012, OCTOBER 2020

I. POLICY

INFORMS Certified Analytics Professional (CAP) Program is established to advance the use of analytics by setting agreed upon standards for the profession and to advance the analytics profession. CAP provides a means for organizations to identify and develop qualified analytics professionals; and it enhances the careers of analytics professionals by promoting continued competence, improving the credibility of the analytics profession, and by improving the visibility of the analytics profession.

II. PROCEDURES

A. Management Team

The INFORMS management team consists of INFORMS' Executive Director, Certification Manager, and the Director of Education and Industry Programs. The ACB and the management team ensure that the certification program is operated in accordance with applicable laws for non-profit organizations at the federal state and local level, the policies and procedures for the certification program, and in accordance with ANSI/ISO/IEC 17024, an international standard for the accreditation of organizations engaged in personnel certification.

The ACB meets periodically to manage the affairs of the certification program and to ensure ongoing and continuous quality improvement in the certification program by using the following procedures.

1. A document control system will be implemented to assure that all critical certification documents are accurate and up to date. The control system will describe how documents are maintained, updated and distributed to the appropriate end users. Each document will include the name of the individual that has the authority to make changes in the policy/procedure, the date of original approval, and dates of amendments. The management team and ACB will conduct an annual review of all certification policies, procedures and key documents.
2. Internal audits will be conducted at least annually and will address certification operation topics and issues identified by the ACB and management team of the certification program. Audits will be conducted by other INFORMS staff and volunteer leaders not involved in the direct management/oversight of the certification program. Once an audit has been completed and abnormalities found, the certification management team will work with the ACB to implement a plan of corrective action. The ACB will conduct a final evaluation of the implementation of corrective action to ensure that proper steps are taken to correct identified problems. All aspects of the internal audit and corrective action process will be documented in ACB minutes.
3. The management team and the ACB will implement preventive actions as needed to maintain appropriate quality levels in all aspects of the certification program.
4. The management team and the ACB oversee continuous modification and updating of all certification program components in accordance with the policies and procedures included in this policy manual.
5. The management team will implement a review process that includes constant oversight and monitoring of the following components of the certification program:
 - a) Organizational structure including appeals, complaints, financial conditions/audits, and staffing workloads.
 - b) Development and maintenance of the certification program
 - c) Subcontracting
 - d) Documentation of quality assurance controls
 - e) Record keeping
 - f) Confidentiality compliance
 - g) Security
 - h) Requirements for proctors
 - i) Oversight of the application process
 - j) Decisions on certification and awarding certificates
 - k) Renewal of certification
 - l) Use of certificates and logos.

B. Operation of the Certification Program

1. **Certifications Offered**

All certifications provided by INFORMS are time limited. The Certified Analytics Professional (CAP[®]) certification is limited to a three (3) year time period. All certificants must successfully complete recertification requirements within this time period to maintain their certification status. Certificants who maintain their certification status and pay all applicable fees will be permitted to continue to use the “CAP[®]” designation.

The ACB may decide to offer other credentials in the future as it deems appropriate for the advancement of its mission.

2. Eligibility for Certification

Certification programs offered by INFORMS include eligibility requirements and an assessment process. Waivers of the education eligibility requirement will be considered on a case by case basis.

a) Experience

(1) At least three years of professional analytics experience for individuals holding an MS/MA or higher degree in an analytics-related area. Areas considered to be related to analytics are listed under 'Education' below.

(2) At least five years of professional analytics experience for individuals holding a BS/BA degree in a related analytics area. Areas considered to be related to analytics are listed under 'Education' below.

(3) At least seven years of professional analytics experience for individuals holding a BS/BA degree or higher in an unrelated analytics area.

b) Education

To qualify, prospective certificants shall hold a BS/BA degree or an MS/MA degree or higher in an analytics-related area including but not limited to: analytics, operations research, management science, statistics, engineering, business administration (and directly related areas like marketing, finance, etc.), applied mathematics, information technology, computer science, decision science, marketing science and others deemed appropriate by the Analytics Certification Board. This degree must be obtained from a regionally accredited college or university recognized by the U.S. Department of Education or similar entities in other countries. Applicants/Candidates must submit a photocopy of an official or unofficial college transcript to demonstrate compliance with the education requirement.

In its meeting on June 27, 2014, the ACB voted to waive these education criteria on a case-by-case basis for persons lacking a degree.

(1) Any request for an education waiver shall include a letter (or email) of recommendation written by a supervisor, transcripts of any formal educational courses taken, and years of experience.

(2) Requests for such waivers will be documented and assembled by the INFORMS Certification Manager and presented to the ACB chair and vice chair for their recommendation as to acceptance. In the event the chair and vice chair are not able to recommend a waiver, said waiver request will be forwarded to the ACB for final determination.

(3) If there is an appeal of a decision on a waiver, it shall go through the established appeal process and shall be referred to the Appeals Committee.

c) Confirmation of Soft Skills

One of the important traits of a certified analytics professional is the demonstration of an acceptable level of soft skills in addition to the knowledge, skills and abilities covered by the CAP[®] examination process. These soft skills include, but are not limited to:

- Ability to communicate with a client/employer regarding the framing of an analytics problem.

- Understanding the background of the client/employer regarding their organization and specific industry focus
- Ability to explain the findings of the analytics process in sufficient detail to assure a positive outcome for the client/employer

The CAP[®] program requires that applicants obtain confirmation of their soft skills from a supervisor or person not related to the applicant who has knowledge of the applicant's soft skills. Individuals who are unable to contact a past employer, supervisor, or client may submit a detailed written summary of a recent analytics project detailing the application of soft skills in the successful completion of the project and in the implementation of its findings. The ACB may in some cases require a telephone interview in addition to a review of the written summary to assess an applicant's soft skills.

d) Code of Ethics or Professional Conduct

INFORMS and the ACB developed a Code of Ethics or Professional Conduct for analytics professionals. Candidates are required to sign an attestation form verifying that they have read the code and agree to abide by it.

e) Procedure for Determining Eligibility for Certification

The initial determination of eligibility is made by the Certification Manager. In the event that an eligibility criteria is challenged by an applicant and the Certification Manager is unable to resolve it, the Chair of the ACB will provide additional guidance and make the final decision. The ACB is only involved in eligibility decisions when the Certification Manager cannot determine a candidate's compliance with stipulated requirements. ACB participation will typically be accomplished by email or teleconference.

f) Application Requirements

All applicants for certification must complete a signed application form. This form shall include, at a minimum, the following:

- The desired certification
- A statement that the candidate agrees to comply with all requirements for certification including a future code of ethics or professional conduct for analytics professionals
- Details of relevant qualifications, confirmed and supported by evidence
- General information including name, title, address and contact information.
- A statement affirming the accuracy of all submitted information

g) Applicant Disclosures

All applicants for certification will be required to sign a legal disclosure statement as part of the application process. This statement will state that all of the application information provided by the candidate is accurate and true. This form will further state that any misrepresentation of application information may be grounds for automatic revocation of certification status.

h) Random Audits of Certification and Recertification Application Materials

Since INFORMS will rely upon applicant provided information regarding analytics-related job experience and verification of soft skills, random audits

will be conducted at least biannually to verify applicant provided documentation.

Applicants randomly selected for these audits will be notified by email. Details of the audit process will be provided at the time. Candidates will be expected to provide certificates or other written documentation supporting claims of education and training. Verification of work experience will be requested from employers, clients or both. Applicants will not be permitted to complete the certification process if they do not successfully complete the audit process. Anyone failing to complete the audit process will receive a refund of their application fee.

C. Description of the Certification Process and Surveillance

1. Certification Process

The following steps describe the usual certification process for applicants, candidates and certificants.

- a) The applicant decides to apply for certification and determines whether he/she meets the eligibility requirements from their own perspective after consulting the INFORMS website, the application, and the CAP Handbook.
- b) The applicant submits an electronic application to INFORMS. The Certification Manager determines eligibility or contacts the ACB to resolve any questions. If the soft skills portion of the application is not complete at time of examination, candidates will have 90 days to submit soft skills confirmation.
- c) All approved applicants, i.e. candidates, may pay for and schedule their examination at a test administration site of their choice or via online examination.
- d) Candidates take the examination and results are confirmed by INFORMS.
- e) All examinations are scored using electronic scoring equipment.
- f) The pass/fail results of the test are provided to candidates upon submission of the electronic test. A confirmation letter is sent from INFORMS and an electronic certificate will be sent to passing candidates in six to eight business days. Failing candidates are notified of retake options and procedures. Failing candidates will also receive information about their examination performance in its major content areas.
- g) All certificants must renew their certifications by the end of the three-year time period commencing upon the date of the written letter confirming certification status.

Notes:

- *Certification is only granted to individuals meeting all applicable eligibility requirements and achieving a passing score on the examination. Grandfathering is not permitted.*
- *Certification examinations may only be taken in a secured and proctored test site or via remoted proctoring.*
- *Examinations must be administered under the supervision of qualified proctor(s). Rules and guidelines for approved proctors are included in the Security section of this manual.*

2. Surveillance of Certificants

One of the responsibilities of a certification program is to conduct surveillance of certificants during the period between certification cycles. INFORMS has decided to utilize the following process for the CAP[®] program:

- a) INFORMS will provide contact information on the certification web site where interested stakeholders may provide information for INFORMS regarding any inappropriate conduct of a certificant or regarding any misrepresentation of certification status. All notifications on this web site must be in writing and the individual providing the notification must identify themselves and provide contact information. Anonymous verbal notifications are not accepted.
- b) INFORMS will conduct biannual surveys of employers of CAP[®] certificants to obtain their impressions of the overall quality and collective performance of certificants. This information will provide INFORMS with data that may signal problems or deficiencies in the certification process.

D. Certification Renewal Process

One of the hallmarks of a strong professional certification program is the implementation of a process to help assure the continuing competence of certificants in the discipline. INFORMS has decided to use a Professional Development Unit (PDU) system like those used in other professional certifications.

Professional development units are measures used to quantify acceptable learning and professional service activities. Essentially, one PDU is the equivalent of one hour spent engaged in approved learning or other professional development work.

All CAP[®] certificants are required to achieve a total of 30 PDUs in the three (3) year renewal period. Table 1 describes various options for achieving the required PDUs along with any required minimum or maximum PDUs specified in each category.

Table 1: PDU Category Descriptions

PDU Category	Description of policy	PDU Points allowed
Participation in formal education/graining programs provided on analytics topics	This option includes courses, seminars, and workshops on analytics-related issues	1 PDU per each hour of instruction. Certificants must achieve at least 8 PDUs in this category during the 3-year renewal period. Certificants cannot earn more than 10 hours in this category in a 3-year period.
Self-directed learning	This category includes reading articles and books or watching instructional videos on analytics issues.	1 PDU per each hour of self-directed learning. Note: Certificants cannot earn more than 10 hours in this category in a 3-year period.
Creating new analytics knowledge or content	Examples include authoring articles, books, newsletters, etc. PDUs are also awarded for serving as faculty at various learning events.	1 PDU is awarded for each hour of activity spent in these activities. Certificants cannot earn more than 10 hours in this category in a 3-year period.
Volunteer service	Examples in this category including serving as a volunteer in INFORMS or its regional chapters, working on analytics meetings, or assisting the certification process.	1 PDU per each hour of self-directed learning. Note: Certificants cannot earn more than 10 hours in this category in a 3-year period.
Analytics professional work experience	Full time employment as an analytics professional for a minimum of 1 year	5 PDUs are awarded for each full year of employment as an analytics professional.

		Certificants cannot earn more than 15 hours in this category in a 3-year period.
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All claimed PDUs must be submitted to INFORMS prior to the conclusion of the certificants three-year renewal cycle. Certificants are reminded that they will not be able to claim more than the maximum PDUs allowed in any specific category.

Certificants are required to keep accurate records of all professional development activities including all certificates/letters confirming attendance/participation in approved education/training programs. INFORMS will periodically audit a sample of certificants to verify the PDUs claimed in their renewal application.

Certificants earning more than the required 30 PDUs in their three year renewal cycle may transfer a maximum of five (5) PDUs to their next renewal cycle.

E. Examination Development and Administration

1. Job Analysis/Role Delineation
The Job Task Analysis (JTA) study defines the current knowledge, skill and abilities (KSAs) that must be demonstrated by analytics professionals to effectively and successfully provide these services. KSAs are validated according to their frequency of use and importance. The JTA also serves as a “blueprint” for determining the content (performance domains) of certification examinations. The following steps must be completed at intervals to be determined by INFORMS. The following activities shall be coordinated by the Certification Manager with input from a diverse group of SMEs divided into groups based on their roles: JTA development/updates; Item writing/exam construction; or Cut score determination. Only the Examination Committee may participate in item writing/exam construction.

- a) Validation Study - A research survey is conducted to determine the validity of the current JTA findings. The survey is sent to an agreed upon national random sample of analytics professionals for validation.
- b) Item Writing – A representative panel of analytics experts will develop questions that are tied to examination specifications and referenced to acceptable coursework, texts or documents in the analytics field.
- c) Exam Construction - All proposed questions must be reviewed, selected and approved by an item writer/examination committee. The constructed examination is then forwarded to a psychometrician for final editing. All INFORMS examinations utilize a four-option multiple choice question format. There is only one correct response for each question. Points are not taken away for incorrect answers. The psychometrician will work with each subcommittee to help them develop the best possible examination forms.
- d) Cut Score Determination - The passing score is to be determined as a standard for public protection using a criterion-referenced methodology. Current passing scores shall not be published in the Candidate Handbook nor on the web site.
- e) Continual Examination Evaluation - Following each examination administration, there is an evaluation and analysis of each question to help ensure the validity of the assessment process. If a question is determined to be flawed, it is revised or replaced. A new examination development process begins upon the retirement of an existing form or earlier depending upon needs determined by INFORMS.

INFORMS examination development is guided by the *Standards for Educational and Psychological Testing* published by the American Psychological Association, the American Educational Research Association and the National Council on Measurement in Education.

2. Examination Retirement

The following rules shall be followed regarding the retirement of examinations and items:

- Each examination form will be evaluated on an annual basis to determine whether it is still meeting the assessment objectives of the JTA.
- Examination forms will usually be limited to 2,000 candidate examinations.
- Items on a retired examination may become eligible for future re-use.
- Retired examination content may be eligible for use in practice examinations.
- Items used on practice examinations are not eligible for use on examination forms.

3. New Item Inclusion

The INFORMS new item inclusion policy is designed to psychometrically examine new items to be used for future examination forms. If INFORMS chooses to pre-test items, performance statistics must be obtained from a minimum of 100 candidates and validated by a psychometric consultant to determine appropriateness for entry into the item bank and use on future examination forms. Pre-test items will not contribute to candidates' examination scores and thus will not affect the pass/fail status.

4. Quality Control Procedures

The following minimum quality control procedures will be followed by the INFORMS management team/consultants:

- a) Examination performance - Each examination form is statistically analyzed by currently accepted psychometric methods. Decisions based upon performance are determined upon consultation with the consulting psychometrician. Results of the statistical analysis are published in an INFORMS report.
- b) Item performance – Each item is statistically evaluated using accepted item analysis techniques. Items performing poorly are reviewed, and either modified, retired or left as is.
- c) Examination delivery – Test sites and independent proctors are monitored for compliance with INFORMS test administration procedures.

5. Special Examination Arrangements

a) Candidates with Disabilities

INFORMS complies with the Americans with Disabilities Act (ADA). INFORMS strives to ensure that no individual with a documented disability is deprived of the opportunity to take the certification examination solely by reason of that disability provided that reasonable special accommodations can be made.

To request special accommodations, candidates must complete the request for Candidate Accommodations as part of the application process. The request includes a statement of the accommodations and a history of previous accommodations in education, training or assessment circumstances. In the absence of a history of previous accommodations, an appropriate, qualified health care provider must submit the Health Care Professional Accommodations form along with a copy of their professional evaluation. The professional evaluation must include a description of the assessment of disability along with positive findings. Both forms are available on the INFORMS web site. Candidates must provide all documentation with their application and fees at least 45 days prior to a desired examination date. INFORMS also requires that applicants notify INFORMS of any requests for special accommodations when scheduling an examination.

b) Candidates Requesting other Special Arrangements

(1) Religious Obligations: If attendance at a scheduled examination date conflicts with a candidate's religious obligations, INFORMS will try to arrange an alternate examination day. INFORMS must receive these requests at least 45 days prior to the scheduled examination date.

(2) Limited English Proficiency: At this time, INFORMS certification examinations are offered only in English. If English is not a candidate's first language, the candidate may request additional testing time by submitting documentation establishing birth or schooling in a non-English speaking country. INFORMS must receive this information at least 45 days prior to the scheduled exam date.

6. Disclosure of Examination Scores

Examination pass/fail information will be sent via electronic communication to each candidate immediately after taking the exam.

The score report will indicate "pass" or "fail" and provide additional information for failing candidates indicating performance in the major content domains assessed by the examination. Examination scores are confidential. INFORMS will not disclose

examination scores unless INFORMS is required to do so by a court order or subpoena. With permission from the certificant INFORMS will publish the names of individuals who have passed the examination and maintain current certification status.

F. Security

All examination materials shall be maintained in a secure fashion. The following security procedures, at a minimum, shall be followed by the INFORMS management team and contractors in test development and administration:

1. Test Development
 - a) Item writers are prohibited from sharing examination information with anyone outside of the item writer pool.
 - b) Item writers must sign non-disclosure agreements specifying compliance with security rules.
 - c) Draft items, the item bank, and all test forms are kept in a secured database when not under review.
 - d) Draft items shall be transmitted by email only when essential for the development of the certification program and shall be encrypted and password protected.
 - e)
2. Test Administration
 - a) Two (2) forms of identification is required of all candidates prior to admission to a test site or online testing. One must be a Government issued photo IDs. Candidates MUST have a reviewed and approved application on file in order to sit for examination.
 - b) Candidates taking examinations shall always be monitored by proctors according to procedures stated in the Proctor Manual.
 - c) Rules of conduct for examinees are reviewed by proctors prior to each examination.
 - d) Staff and volunteer access to examination materials is limited to the Certification Manager, designated INFORMS volunteers, and officially designated proctors for a specific examination administration.
 - e) Formal reports are to be filed regarding all testing irregularities.
 - f) All examination materials are the sole property of INFORMS. Examination materials are not available for review by candidates before or after the examination.
 - g) The sharing or reporting of the substance of any INFORMS examination content, orally or in writing, with anyone, including other candidates, employers or course instructors is prohibited.
 - h) No visitors are allowed at examination sites other than officially designated INFORMS observers.
 - i) Failing candidates are only permitted to retake the examination two (2) additional times without providing INFORMS evidence of completion of additional training, continuing education or formal professional development.
 - j) Passing candidates are not allowed to take the exam again.
3. Hand Scoring

Candidates receiving failing scores may request a hand scoring of their answer sheet. A fee will be charged for this service. Information about hand scoring will be included with the candidate's score report and in the candidate handbook. Requests

for hand scoring must be received no later than 30 days following the release of examination results. Requests received later than 30 days will not be processed.

4. Proctors
 - a) Proctors are prohibited from administering examinations to their friends, relatives, students, employees or employers.
 - b) Proctors are required to follow all test administration rules and procedures.
 - c) Proctors are required to sign the Proctor Agreement and Certification Statement.

G. Other Certification Program Policies and Procedures

1. Fees and Refunds

All INFORMS certification fees are drawn on U.S. banks and payable in U.S. dollars. Specific fees may change from time to time based upon decisions of INFORMS. INFORMS may offer discounts on certification fees to current INFORMS members or other certification partners.

Refunds may be provided in some circumstances, but not after a candidate has begun an examination. INFORMS reserves the right to impose a processing fee on certification refunds.

2. Non-Discrimination

INFORMS does not discriminate among candidates on the basis of race, color, creed, gender, age, religion, national origin, ancestry, disability, military discharge status, sexual orientation or marital status. INFORMS strives to adhere to all federal, state and local regulations pertaining to non-discrimination practices.

3. Certificates

INFORMS will provide all successful candidates with a formal certificate indicating current certification status. This certificate will contain at least the following information:

- The name of the certified individual
- A unique certification number
- The name of the certification body
- A reference to the standard upon which the certification is based
- The scope of the certification
- The effective date of certification and expiration of certification status
- Certification seal

Certificants are required to use their certification marks and logos in accordance with policies developed by INFORMS. Any misuse of certification marks or the logo is potential grounds for revocation of certification status. Certification candidates who have not received formal verification of current certification status are prohibited from using these credentials in any setting.

4. Records Maintenance and Retention Policy

INFORMS will, at a minimum, maintain the following records regarding its certification program:

- a) Certificant Records
 - Initial Applications
 - Renewal/recertification application materials

- Accommodation requests
 - Appeals records
- b) Disciplinary Actions
- Active
 - Closed
- c) Examination Records
- Item bank and information regarding specific items
 - All forms of the examination
 - Candidate examination results
 - Candidate correspondence regarding pass/fail
- d) Administrative Records
- Minutes of Analytics Certification Board (ACB) meetings
 - Copies of all versions of policy and procedures manuals
 - Copies of Bylaws and legal documents (contracts/agreements)
 - Copies of Annual Reports
 - Copies of statistical reports
 - Copies of role delineations/job analysis documentation
 - Documentation of the passing score determination process
- e) Records Policies
- (1) All candidate/certificant records are stored in secure password protected electronic files and access is limited to appropriately designated employees based upon their job description.
 - (2) All materials received by INFORMS via mail or courier mail will be date-stamped upon receipt.
 - (3) All communication sent by email must include the date in the correspondence.
- f) Retention Policies
- (1) Permanent record retention is required for the following records
 - Official minutes of certification board meetings
 - Certification annual reports
 - Copies of Certification Policies and Procedures (and updates)
 - Records of all appeals and disciplinary actions
 - Candidate identification information with certification status and examination dates
 - Records of appeals and disciplinary actions
 - Records of accommodations requests and accommodations granted
 - Copies of job task analyses documentation
 - Documentation of cut score determination process
 - Statistical reports
 - Full records of candidate examination responses
 - Other materials as determined by the Certification Manager
 - (2) A three (3) year retention period is required for the following records unless a longer period is stipulated, or required by state or federal law:
 - General correspondence regarding certification issues
 - Financial records

- Contracts/consultation agreements (7 years)
- Research reports
- Forms of the examination
- Candidate application information

(3) No retention period is required for the following documents

- Draft documents
- Reminder notes
- Duplicate copies of records no longer needed
- E-mails not covered under the preceding time limits
- Chronological files

Note: It is generally up to the originator(s) or recipients of these documents to determine when the document's business utility has ended.

5. Contractors/Vendors

INFORMS will develop criteria for the selection and periodic evaluation of contractors/vendors.

INFORMS does not authorize any vendor to make final decisions regarding an applicant's certification status. INFORMS shall take full responsibility for such subcontracted work. INFORMS will in all cases maintain formal responsibility for granting, maintaining, renewing, expanding and reducing the scope of certification, and suspending or withdrawing such certification.

All contractors/vendors dealing with confidential certification data will be required to sign a confidentiality/non-disclosure agreement.

INFORMS will develop formal agreements for all subcontracted certification work. In addition, INFORMS will develop a process to monitor and evaluate the ongoing performance of all contractors/vendors providing services for the certification program. These evaluations will be conducted at least once a year and the results of such evaluations will be recorded in a written document.

H. Disciplinary Actions, Procedures, and Appeals

1. Disciplinary Actions

Certificants are required to comply with all existing and future rules, regulations, and administrative ethical standards for certification established by INFORMS.

Certificants are responsible for demonstrating compliance, and failure to do so may lead to disciplinary actions, including but not limited to the denial of eligibility, non-renewal of a certification, revocation of certification, probation or suspension, issuance of a letter of censure, or issuance of a written reprimand. Individuals may report alleged violations of INFORMS Code of Ethics and other grounds for potential disciplinary actions noted below in writing to INFORMS. Written documentation should include the identity of the individual involved in the alleged misconduct and the nature of the misconduct described in as much detail as possible, and the signature of the individual filing the complaint.

INFORMS also has the authority to initiate a disciplinary action without receiving a complaint or notification of inappropriate conduct. INFORMS also reserves the right to pursue any and all civil and legal remedies available under the law.

Grounds for disciplinary action include, but are not limited to, the following list:

- a) Violation of CAP® Code of Ethics.
- b) Conviction of any felony involving moral turpitude.
- c) Conviction of any other criminal offense which reasonably calls into question the certificant's ability to provide professional analytics services.
- d) Engaging in, authorizing, or aiding or abetting fraud, deceit, misrepresentation of material facts, provision of false or forged evidence, or bribery in connection with any application for a certificate or registration.
- e) False statements made in any initial or renewal application materials.
- f) Obtaining or attempting to obtain certification or renewal by any fraudulent means.
- g) Use of expired credentials or false or unauthorized use of any INFORMS credentials.
- h) Unauthorized possession or distribution of INFORMS examination or testing materials.
- i) Unauthorized use of any registered trademark of INFORMS.

INFORMS shall have the authority to establish procedures for hearings and potential reinstatement upon satisfactory assurance of proper conduct.

Individuals who wish to report a potential credentialing violation may email a letter to certification@INFORMS.org send a written letter of complaint to:

INFORMS Certification Manager
 Institute for Operations Research and the Management Sciences
 5521 Research Park Drive, Suite 200
 Catonsville, Maryland 21228.

2. Disciplinary Procedures:

Upon receipt of a complaint, INFORMS Certification Manager will first determine whether it includes the necessary elements identified in Section H. If the INFORMS Certification Manager determines that a complaint is deficient, the INFORMS Certification Manager may notify the complainant that the complaint will not be considered. If a complaint does meet the requirements of Section H, then the INFORMS Certification Manager shall convene an ad hoc panel of three persons with one (1) current member of the INFORMS Board of Directors and one (1) current/former member of INFORMS Analytics Certification Board (ACB) who do not have a conflict of interest with any party to the complaint. Candidates for a panel will be asked to disclose any conflicts prior to appointment. In cases of conflicts of interest disclosed or discovered after a panel has been constituted, the conflicted person may be replaced. This impartial committee will investigate the complaint and determine its resolution, which may include but is not limited to:

- a) Dismissal of the complaint
- b) Suspension of certification for a stated period during which the certified person may no longer claim to be certified
- c) Revocation or removal of certification status for a stated period of time
- d) Permanent revocation or removal of certification
- e) Publication of revoked status on website or in other INFORMS publications

The panel will adhere to basic due process considerations, including providing notice to the certificant of the allegations contained in the complaint and providing the

certificant an opportunity to respond in writing. The panel also may, in its discretion, hold a hearing on the complaint.

3. Procedural Decisions Eligible for Appeal

Both INFORMS and the Certification Program recognize their responsibility to ensure that all qualified candidates have equal access to the examinations and to the benefits of being a Certified Analytics Professional.

There may be times during the application and designation process or at the end of the application process where an applicant, candidate or certified person is denied the ability to proceed further in the CAP® program.

The following situations may lead to an appealable decision:

- a) Applicant lacking required years of experience or education
- b) Applicant not having graduated from an accredited institution
- c) Applicant not having paid the required fees in a timely manner
- d) Applicant not having passed the examination
- e) Applicant not having rescheduled examination in a timely manner
- f) Candidate not having passed the examination
- g) Certified person not having recertified in a timely manner

Appealable Procedural Decisions include the following:

- Denial of eligibility for certification
- Denial of certification
- Denial of renewal

4. General Appeals Information

Disciplinary actions and procedural decisions may be appealed by the certificant.

a) Appeals Process

Applicants, candidates or certificants must submit written documentation within thirty (30) days of the receipt of the written decision by INFORMS. The written documentation should specify the grounds on which the appeal is based. An appeals fee must be submitted and drawn on a U.S. bank in U.S. dollars with the letter of appeal.

b) Appeals Panel

INFORMS will appoint an appeals panel of the ACB with at least three persons, with one (1) current member of the INFORMS Board of Directors and one (1) current/former member of the ACB. None of these individuals shall have had any affiliation (business, professional, or personal) with the individual filing the appeal. Candidates for a panel will be asked to disclose any conflicts prior to appointment. In cases of conflicts of interest disclosed or discovered after a panel has been constituted, the conflicted person may be replaced. The appeals panel will strive to conduct their work and render a written decision within 60 days of their appointment.

c) Appeals Decisions

The Appeals Panel shall address and render a decision on only (a) allegations of procedural error, or the making of a decision with insufficient evidence to support it. Appeals regarding required compliance with existing and published

testing standards or program requirements are not accepted. The appeals panel may render a decision to uphold the INFORMS decision, grant the appeal requested by the appellant or refer the matter back to the INFORMS for reconsideration in light of the panel's findings regarding procedural violations or insufficient evidence. A written copy of the Appeals Panel decision shall be sent to the ACB and to the appellant. Successful appellants shall be refunded their appeals fee.

d) Confidentiality

All complaints or appeals proceedings shall be held confidential, to the extent feasible allowing for investigation, until a final decision is reached, at which time only the results of complaints concluding in revocation of certification status may be publicly released. All committee members, both ad hoc and ACB where involved, shall sign agreements to uphold the confidentiality of the complaints or appeals process.

I. Professional Education Partner (PEP)

INFORMS has developed a Professional Education Partner (PEP) program to help certification candidates, certificants, and other interested stakeholders identify professional development/training providers that meet pre-established criteria verifying their CAP[®] ability to provide acceptable ongoing training/education to meet CAP[®] renewal requirements.

The program role is limited to assistance of certification candidates, certificants, and other interested parties in determining acceptable professional development providers for certification preparation and renewal purposes. This process should not be confused with a more comprehensive and formal accreditation process for education/training in analytics.

Listing organizations as recognized providers of education/training in analytics assures candidates and certificants that classes/coursework offered by recognized providers and used for certification preparation or renewal purposes, will be automatically recognized by INFORMS as an acceptable provider of professional development in analytics.

1. Procedures

The review and approval process for provider applicants will be conducted as follows:

- a) Interested providers of professional development/training in analytics will review the requirements for the Professional Education Partner program specified on the INFORMS web site certification pages. Criteria for acceptance are provided below.
- b) Applicant individuals/organizations will complete and return the application. The Certification Manager will review all applications and make recommendations for approval or denial according to previously agreed upon criteria.
- c)
- d) Denied applicants will be notified in writing and have an opportunity to submit additional information verifying compliance with approval criteria. This information must be submitted to INFORMS within 30 days of the receipt of denial .
- e)
- f) Applicants that are approved for recognition and that have paid the required application fee and first year approval fee will be listed on the INFORMS web site as “Professional Education Partner.”
- g) The Professional Education Partner must pay the annual fee to maintain approval status and continue their listing on the INFORMS web site.

Criteria for designation as a Professional Education Partner will include, but not be limited to, the following:

- Appropriate information on the background of the sponsoring individual or organization
- Appropriate education/training administration practices
- Appropriate brochures/promotional materials for previous offerings in analytics
- Appropriate listing of analytics topics provided in education/training
- Appropriate faculty requirements and CVs
- Appropriate facilities used for education/training
- Appropriate fees for education/training
- Appropriate evaluation data from participants in education/training

2. Disclaimers

- Listing as a Professional Education Partner does not constitute any warranty or guarantee by INFORMS regarding the quality of the content in all programs/courses provided by a recognized provider
- Listing as a Professional Education Partner does not constitute that the provider is “recommended” by INFORMS.
- Listing as a Professional Education Partner does not constitute INFORMS endorsement of all theories of analytics or analytics products/services that may be referred to in specific courses.

INFORMS will provide contact information if individuals wish to register written complaints about any Professional Education Partner related to the approval criteria.