What iCAS is Up To:
Updates on Credentials in Data Science and Predictive Analytics and Catastrophe Risk Management

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CAS Annual Meeting

Agenda

- What is The CAS Institute?

- Requirements for the Certified Specialist in Predictive Analytics (CSPA) credential

- Requirements for Catastrophe Credentials

- Credentialing Process and Timeline

- Membership and Practice Communities

- Questions and Discussion

What is The CAS Institute?

- Subsidiary of the Casualty Actuarial Society
- Provides specialist credentials and resources for quantitative professionals in selected areas, such as:

Predictive Analytics / Data Science

Quantitative Reinsurance Analysis

Capital Modeling / ORSA analysis

Catastrophe Risk Management

Other analytics and quantitative specialties

Why was The CAS Institute Created?

To meet market needs for quantitative specialists

To serve professionals in areas where quantitative skills and actuarial skills overlap or are complementary

To allow the CAS to continue the credentialing of property-casualty actuaries and to address needs of broader audiences

What Value will The CAS Institute Credentials Provide?

- Provides recognition of expertise and knowledge

- Demonstrates knowledge of practical applications

- Sets credential-holders apart from others

- Advances both knowledge and practical skills

- Prepares a specialist for additional job duties

- Helps advance and enhance a specialist's career

- Provides a practice community to meet colleagues

How are the CAS and The CAS Institute Different?

Casualty Actuarial Society	The CAS Institute
Independent professional society	Wholly-owned subsidiary of CAS
Premier credentialing and professional association for property and casualty (P&C) actuaries	Offers specialist credentials in selected quantitative practice areas and is available to practitioners with or without an actuarial background
For actuaries working primarily in the insurance sector	Will be set up to offer credentials in multiple industries and sectors, starting with P&C risk and insurance
Time required to earn CAS Fellowship credential: 7 years	Time required to earn a specialty credential: 1-2 years

How does the CAS Institute Credentialing Process Work?

Candidates follow a relevant course of study, based on self-study programs that meet specified learning objectives.

- Knowledge and competency assessments will include exams and a case study project.
- Experienced practitioners can also pursue a credential by a separate process that considers academic degrees, published works in the field, and other evidence of practical specialized knowledge and experience.

How will the CAS Institute Ensure the Quality of its Credentials?

Oversight by an expert panel of industry specialists and thought leaders in each practice area that:

- Establishes eligibility requirements
- Creates the curriculum
- Directs development of educational materials
- Sets competency levels
- Oversees high-quality examinations
- Evaluates experienced practitioners

What is the Expected Rigor and Time Commitment Compared to CAS Exams?

Not as comprehensive as actuarial requirements, but more in-depth for quantitative specialization

- Narrower focus with deeper dive in certain specialized quantitative areas
- Less time to complete than for ACAS or FCAS
- Less of a time commitment than for a Masters or PhD

What credentials are being offered?

- **Certified Specialist in Predictive Analytics**

- **Catastrophe Risk Management Credentials**

  Two Levels:
  - Certified Catastrophe Risk Management Specialist (working title)

  - Certified Catastrophe Risk Management Professional (working title)

About ISCM

- **February 15, 2017: iCAS and ISCM Announce Partnership on Initiatives to Support Specialized Risk Professionals**

- **ISCM is a professional association that promotes catastrophe management professionalism within the insurance industry.**

- **ISCM is a global organization with members in over 25 countries**

- **ISCM provides forums for exchange of ideas, understanding current catastrophe management issues, and networking among catastrophe managers.**

ISCM/ICAS Alliance
Organization

Approval and Authority	**ISCM** **iCAS**
Advises & Recommends Final Program	**Advisory Committee**
Develops Curriculum and Learning Objectives	**Subject Matter Working Groups**

ISCM/ICAS Alliance
Organization – Roles & Responsibilities

- Authority
  - ISCM
  - iCAS

- Advisory Committee
  - Responsibilities – Advise & Recommend
  - Creation & maintenance of curriculum structure & content
  - Oversight of certification process

- Subject Matter Working Groups
  - Responsibilities – Develop curriculum and learning objectives
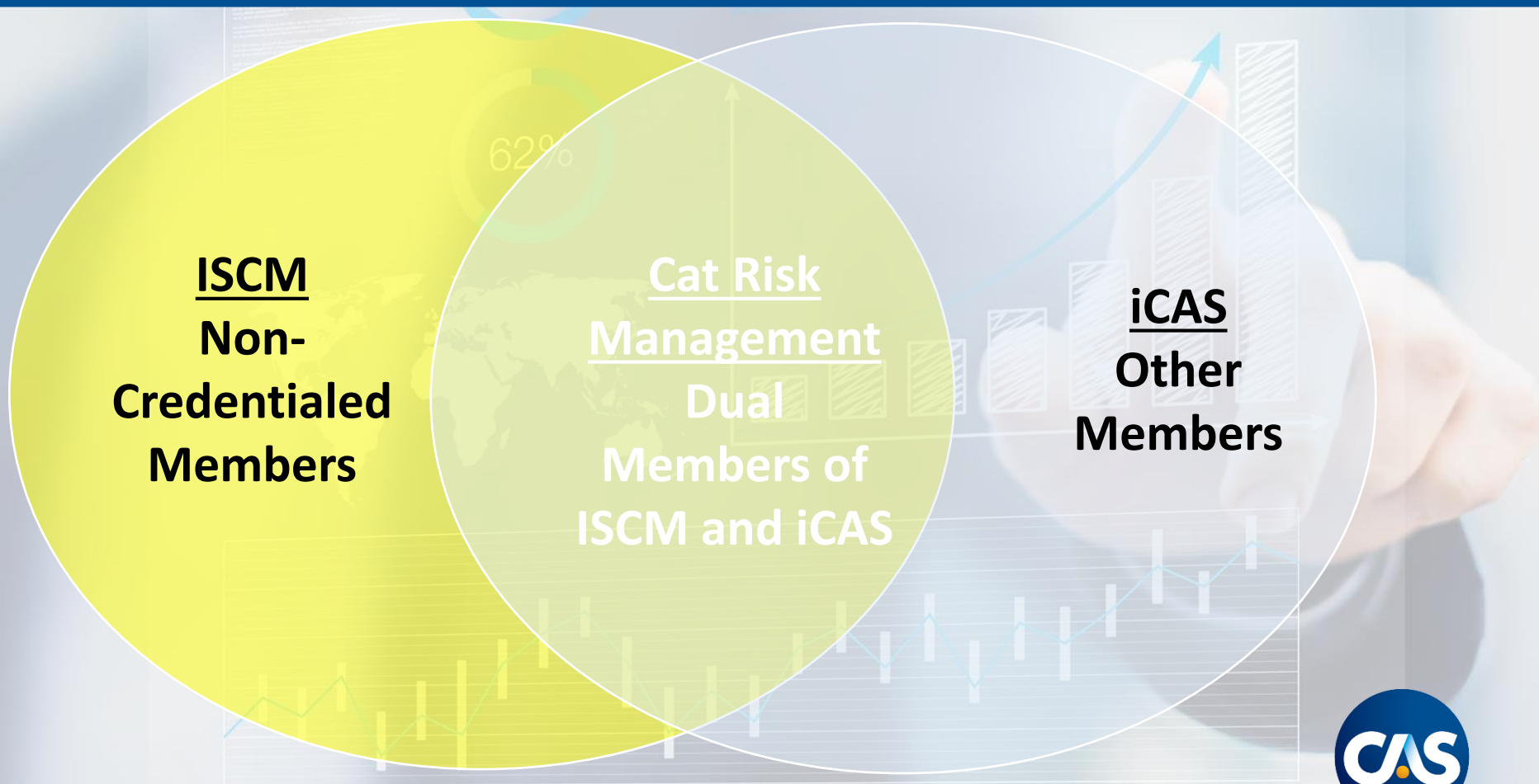
Advisory Committee

ISCM		iCAS
Executive Committee	**Past Presidents**	
President: Nick DiMuzio	Ron Nash	Bob Miccolis
Vice-President: David Keeton	Andy Castaldi	Albert Beer
Secretary: Minchong Mao	Carl Hedde	Howard Kunst
Treasurer: Shari Zola	Maria Kovas	Amy Brener
Past President: Randy Law	Education Committee Chair: Dan Dick	Joanne Spalla

What credentials are being offered?

- **Catastrophe Risk Credentials**

  Two Levels:
  - Certified Catastrophe Risk Specialist (working title)

  - Certified Catastrophe Risk Management Professional (working title)

Catastrophe Management Credentials

1st Tier Certification

- CAT Underwriting & Analytics
- Goal: Understand how CAT models work and how they can be used

2nd Tier Certification

- CAT Risk Management
- Goal: Demonstrate Advanced Application of CAT Risk Management

Certified Catastrophe Risk Specialist (working title)

1st Tier Certification - CAT Underwriting & Analytics

Goal: Understand how CAT models work and how they can be used.

- Ethics
- Insurance Fundamentals for Catastrophe Risk
  - Insurance & Reinsurance
- Basic CAT Modeling
  - Hazard & Vulnerability
  - Financial Structures
- Statistics & Data Management
  - Statistics & DB Fundamentals

Certified Catastrophe Risk Management Professional (working title)

2nd Tier Certification - CAT Risk Management

Goal: Demonstrate Advanced Application of CAT Risk Management

- Advanced Concepts
  - Advanced Statistics
  - Financial Modeling
  - Capacity Allocation

- Advanced Applications
  - Customizing Model Results
    - Vulnerability adjustments
    - Hazard Adjustments
    - Accumulation Adjustments

Experienced Practitioner Pathway

- Requirements
  - Demonstrate mastery of required subject matter – Both Tiers
- Application
  - Outline of specific work examples demonstrating competencies
  - Provide references to confirm
- Review
  - Advisory Committee
  - ISCM Education Committee
  - Other Experience Practitioners
- Approval
  - Advisory Committee

Data Science/Predictive Analytics Credential

- Certified Specialist in Predictive Analytics ("CSPA")
- Open to actuaries and non-actuaries
- Rigor and time commitment is not as comprehensive as actuarial credentials, but more in-depth for quantitative specialization
- Narrower focus with deeper dive
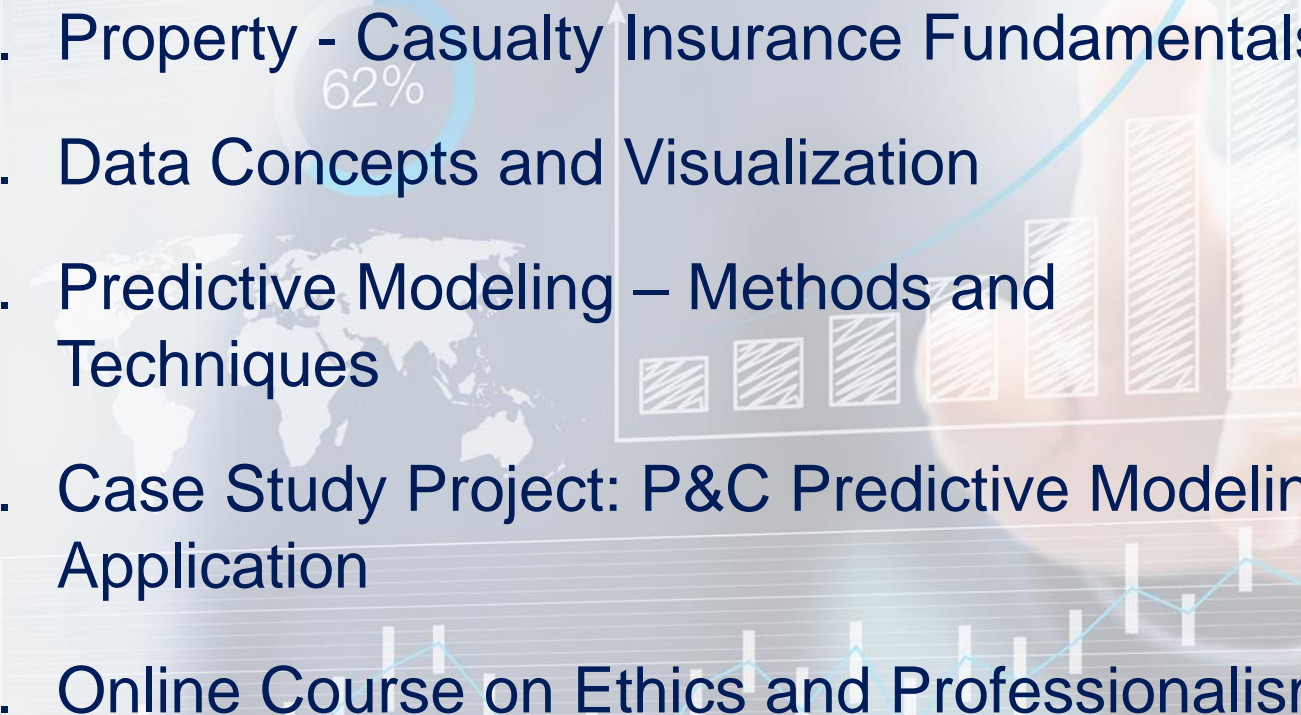- Exams now available at 8,000 test sites in 160 countries

Why Offer the CSPA Credential?

- While data science is core to actuarial science, all of actuarial science isn't necessarily core to data science

- To address a burning market need
  - Employers want data scientists who know about insurance, and actuaries who know about data science
  - Employers want a reliable credential for talent management

- To provide a vehicle for actuaries to update their skills

- To create a bridge between the two disciplines

CSPA Credential Requirements: Overview of Assessments

1. Property - Casualty Insurance Fundamentals

2. Data Concepts and Visualization

3. Predictive Modeling – Methods and Techniques

4. Case Study Project: P&C Predictive Modeling Application

5. Online Course on Ethics and Professionalism

CSPA Credential Requirements: Assessment 1

Property – Casualty Insurance Fundamentals

- Covers core principles underlying P&C insurance and risk management and concepts needed for analyzing and modeling P&C data and risks
- Study materials from CAS Online Courses 1 & 2 and Intro to Ratemaking / Reserving (CAS Exam 5)
- **Online module with knowledge checks and quizzes**
- **3 hour exam with multiple choice questions**
- **4 exam periods/year at computer-based exam sites**
- Waiver for eligible ACAS/FCAS or completion of CAS Online Courses 1 & 2 and CAS Exam 5

CSPA Credential Requirements: Assessment 1 Topics

- Intro to Risk Management
- Insurance Company Operations: Marketing, Underwriting, Auditing, Actuarial and Claims
- Insurance Policy Analysis
- Common Coverages
- Factors Affecting Exposure to Loss
- Regulation of Insurance
- Basic Concepts and Functions of Ratemaking and Reserving

CSPA Credential Requirements: Assessment 2

Data Concepts and Visualization

- Covers the foundational concepts and tools associated with preparing and managing data and datasets
- Slight focus on P&C risk and insurance applications for quantitative analyses, predictive modeling and analytics
- **Online module with knowledge checks and quizzes available; offered online and on-demand**
- **Syllabus also includes supplemental readings**
- **3 hour exam with multiple choice questions**
- **4 exam periods per year at computer-based exam sites**

CSPA Credential Requirements: Assessment 2 Topics

- Data Sources
- Data Access
- Data Usage
- Data Quality
- Insurance Applications
- Regulations
- Data Tools
- Exploration
- Univariate Analysis
- Multivariate Analysis
- Visualization

CSPA Credential Requirements: Assessment 3

Predictive Modeling – Methods and Techniques

- Covers the concepts, methods and tools used for statistical analyses, predictive modeling and data analytics with applications for P&C insurance
- Focused on advanced modeling tools using various multivariate regression techniques, statistical modeling, machine learning and practical applications
- **4 hour computer-based exam that includes access to datasets and software and ability to write and run computer programs**
- **2 exam dates per year via live proctoring**

CSPA Credential Requirements: Assessment 3 Topics

- Identifying the business problem
- Designing the model
- Preparing the data
- Selecting features
- How to choose a model
- Interpreting the output
- Sharing the output

CSPA Credential Requirements: Assessment 4

Case Study Project

- Demonstrates candidate's ability to apply the knowledge and skills covered in the other requirements.

- Candidates are given a project scope, business problem and data set – project work is to build a predictive model to address the business problem.

- Project report: documentation, results, visualization

- The project completed via online secure environment within a prescribed time period (2 months).

- Submitted projects reviewed; additional work may be needed; 2nd submissions are final.

- Candidates may be questioned about their project.

CSPA Credential Requirements: Assessment 4 (cont.)

- A case study project with a dataset to be worked on independently
- Design a predictive model to assist in managing a typical business problem
- Provide a management report with the relevant output for decision making
- Examples of project areas:
  - Claims
  - Underwriting
  - Pricing/Ratemaking
  - Marketing
  - Risk Management
  - Operational Performance

CSPA Credential Requirements: Ethics Assessment

Online Course on Ethics and Professionalism

- Covers ethical behavior crucial to preserving the trust in the work and opinions of a professional.
- Addresses expectations for insurance practitioners and uses insurance case studies to outline an ethical framework.
- Focuses on insurance transactions and maintaining the public's trust in insurance.
- Online module with knowledge checks and quizzes; offered on-demand
- No exam, no fee
- Waiver for ACAS/FCAS or completion of CAS Course on Professionalism

CSPA
Continuing Education Requirements

- 60 units of CE relevant to the practice of predictive analytics or data science in the practitioner's industry every two years.

- Minimum of 10 of these units must be "Structured."

- 30 <u>prescribed units</u> MUST satisfy the following:
  - Minimum 6 units of Ethics and Professionalism
  - Minimum 4 units of Data Management
  - Minimum 20 units of Predictive Analytics & Modeling Techniques

- 30 <u>elective units</u> may be from any of the six content areas with the following restrictions:
  - Maximum 15 units of industry knowledge
  - Maximum 6 units in relevant business oriented skills
  - Business oriented skills courses may not be used to fulfill the

CSPA
Continuing Education Requirements

Who Does it Apply to? All CSPA Credential Holders

When: Must be fulfilled by December 31 of the second full year following receipt of the CSPA credential, and December 31 of every second year thereafter.

What: Six Content Areas:
1. Ethics and Professionalism
2. Data Management Techniques
3. Predictive Analytics/Modeling Techniques
4. Industry Knowledge
5. Business Skills

The CAS Institute
Facts & Figures

- Almost 400 Members
- 40% Non-Actuaries
- Members work at over 200 Companies
- 10 Countries Represented
- Over 200 CSPA's Awarded via Experienced Practitioner Pathway

The CAS Institute CSPA Exam Statistics

- PC1[1]: 97 enrolled/41 exams taken
- PC2[2]: 32 enrolled/21 completed
- DS1: 187 enrolled/93 exams taken
- DS2: Offered September 13th
- Project: To be offered 4Q 2018

[1]waived for FCAS and ACAS
[2]for those holding CPCU or who have passed CAS Online 1 and 2

iCAS Membership and Practice Communities

- Open membership – credential not required
- For those active in iCAS practice communities
- Membership required for:
  - Obtaining waivers for credential requirements
  - Registering for predictive modeling exam or case study project
  - Access to online community
- Annual dues: $250
- Members agree to follow the iCAS Ethical Principles for Professionals

iCAS Members-Only Online Community

The CAS Institute –Timeline

2017
- CSPA Part 1 exam offered Jan-Mar
- 1st CSPA credentials awarded in March (for Experienced Practitioners)
- CSPA Part 2 – Course opened March; exam offered Oct-Dec

2018
- CSPA Part 3 – 1st offering September 13th
- CSPA Project – 1st offering November
- First Cat Management Course/Exam – opened in October

2019
- Second Cat Management Exam – 2nd Quarter
- Introduction to Catastrophe Modeling Exam – 3rd Quarter

Questions and Discussion

TheCASInstitute.org
CatRiskCredentials.org