CAS Exam Committee Presents:

CAS EXAMINATION PROCESS

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2011 CAS Annual Meeting
Chicago, IL

Agenda

- CAS Admissions Overview
- The Syllabus – it all starts here
- The Prelims – CAS/SOA joint exams
- The Finals – Associateship and Fellowship exams
- Post-Fellowship – Volunteering

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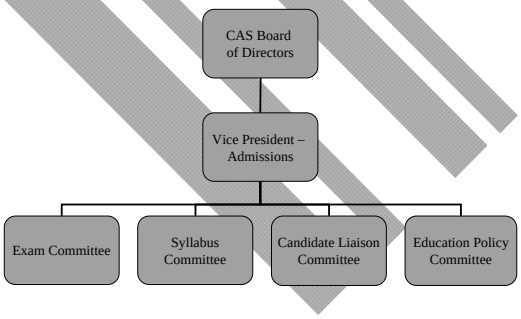
CAS Admissions



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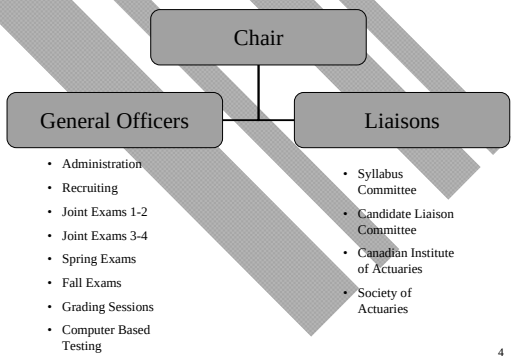
Exam Committee



- Administration
- Recruiting
- Joint Exams 1-2
- Joint Exams 3-4
- Spring Exams
- Fall Exams
- Grading Sessions
- Computer Based Testing

- Syllabus Committee
- Candidate Liaison Committee
- Canadian Institute of Actuaries
- Society of Actuaries

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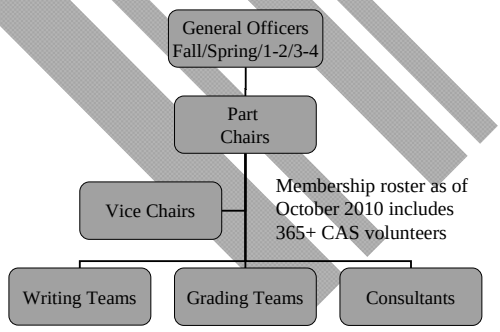
Exams



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Committee Structure – Roles

(rather abbreviated)

- CAS Board of Directors
  Provides guidance, direction, policy
- VP – Admissions
  Budget management, pass mark approval, final arbiter of disputes
- Exam Committee Chair
  Manages day-to-day activities of committee, communications, appeals

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Committee Structure – Roles
(rather abbreviated)

- General Officer
  Senior member responsible for group of exams or committee process
- Part Chair
  Senior member responsible for construction and grading of one exam part
- Vice Chair
  Senior member responsible for assisting the Part Chair, manages grading program for CAS 5-9

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Committee Structure – Roles
(rather abbreviated)

- Consultant
  Seasoned member responsible for final review of exam draft
- Writer
  Member responsible for constructing individual questions
- Grader
  Member responsible for scoring individual test papers

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Syllabus Committee
Mission and Organization

- Mission
  - The Syllabus Committee determines the **scope and content of the syllabus** (learning objectives and knowledge statements) and **course of readings** for the CAS Examinations.
  - The committee also **directs the preparation of educational material** for the *CAS Syllabus of Basic Education*.
- Syllabus Committee
  - Chairperson – Serves three one-year terms
  - Vice Chairperson – Traditionally appointed in the final year of Chairperson's term and succeeds Chairperson the following term.
  - Senior Part Specialist – responsible for development and execution of the *Review Plan* for a specific exam
  - Part Specialists – assist the Senior Part Specialist
- Syllabus Committee Collaborators
  - Vice President – Admissions (Liaison); *Conduit to/from leadership*
  - Executive Council: *delegated authority by Board of Directors*
  - Examination Committee (Liaison)
  - Editorial Committee
  - Education Policy Committee
  - CAS Staff Liaison
  - Candidate Liaison Committee
  - Preliminary Examination Education Curriculum Committee

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Syllabus Committee
Review and Production Cycle

- Review Plan submitted for discussion at Syllabus Committee Meeting
- Execution of Review Plan
- Vote on Changes
- EC Approval
- Memo of Changes Posted
- Syllabus revisions due to CAS office
- Reviews and approvals by SoA, Syllabus Chair, Senior Part Specialists
- Syllabus → CAS Web Department
- Syllabus Posted Online
- Study Kits and Updates Available

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Syllabus Committee
Review and Production Cycle

- In-person Meetings
  - Previously the Syllabus Committee met three times during a review cycle
  - Current approach is to meet twice per review cycle (Chicago)
- Review Cycle is intended to provide continual review and improvement with respect to scope and content of the syllabus and course of readings
  - Edition updates
  - New papers (Domestic and International)
  - New research (e.g., ERM, GLM)
  - Current Events (e.g., IFRS, Solvency II)
- New (bifurcated) Review Cycle
  - Cycle was initially developed to conclude with a printed Syllabus
  - Spring (Odd) Exams
    - » Review Plan for Spring 2013 Exams approved Fall 2011
    - » Review Plan Executed Fall 2011 → Spring 2012
    - » Changes for Spring 2013 Exams approved late Spring 2012

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Syllabus Committee
Review and Production Cycle

- New (bifurcated) Review Cycle
  - Fall (Even) Exams
    - » We initially attempted to have a separate review cycle for Fall exams that started in the Spring and concluded in the Fall (reverse of Spring cycle)
    - » Difficult to marshal volunteer resources during the Summer
    - » Didn't work well with the recruiting cycle
    - » First Review Plan for Fall 2013 Exams approved Fall 2011
    - » Review Plan Executed Fall 2011 → Spring 2012
    - » Changes for Fall 2013 Exams approved late Spring 2012
    - » Second review to address recent developments recent developments proposed Spring 2012
    - » Review Plan Executed Spring 2011 → Fall 2012
    - » Final changes for Fall 2013 approved in Fall 2012

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Syllabus Committee
Recent Significant Developments and Considerations

- Coordination with CERA Goals
- Computer-Based testing
- Commissioned Study Materials
  - "Basic Ratemaking" (Werner, Modlin)
  - "Estimating Unpaid Claims Using Basic Techniques" (Friedland)
- Twice per year upper level exams
- Models for International Actuarial Organizations (US, Canada, Taiwan)
- Multiples texts
- Candidate Feedback
- Other initiatives considered:
  - Capstone Seminar
  - Pre-Fellowship tracks

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Joint Examination Overview

- Exams 1/P, 2/FM and 4/C are now offered by computer, more than twice a year.
- Exams MLC, 3L and 3F/MFE are still written twice a year.
- Exams 1/P and 2/FM now give candidates preliminary results when they finish the exam.

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Committee Functions: Exams 1-4
1. Item Writing

- Creation cycle varies by exam.
- Each committee member writes 5 to 6 questions on assigned learning objectives.
- Exclusive use of multiple choice questions
- Detailed solutions to facilitate use in computer based testing environment
- Peer review – all committee members solve and verify accuracy of each question and solution.

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Committee Functions: Exams 1-2
2. Exam Construction

- For exams 1 & 2, an algorithm selects a unique exam for each candidate, that is balanced for Syllabus coverage and difficulty.
- New items are created continuously and used to replace older questions.
- New exam questions are then pre-tested in the computer based environment.
  - These questions do not count towards a students exam score.
  - Each student receives the same number of pre-test questions.

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Committee Functions: Exams 3L-3F
2. Exam Construction

- For exams 3 & 4, all committee members, part chair and vice chair, and some consultants review all items and model solutions to select questions.
- Best items selected are then edited as necessary for clarity, style and convention by committee members.
- Two rounds of full exam review including part chair and vice chair plus:
  - Round 1: First part chair, vice chair and consultants
  - Round 2: Second SOA examination committee chair, general officers from SOA and CAS, part chair, vice chair and proof reader

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Committee Functions: Exams 1-4
3. Setting the Pass Mark

- Part committee members estimate how many points the *Minimally Qualified Candidate (MQC)* will score on each item.
- The total of the item-by-item *MQC* point estimates forms an *a priori* pass mark that will be the starting point for pass mark discussion panel.
- Final pass mark is set by SOA examination committee chair, SOA & CAS general officers, part chair, vice chair. This is approved by the boards of the CAS, SOA, and CIA.
- For computer based exams the pass mark is a function of the difficulty of the specific questions asked. This sets a unique pass mark for each exam and allows for instantaneous results.
- Not in Vegas every meeting, but still pretty good locations

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Committee Functions: Exams 5-9 Process Overview

The Exam Committee's production cycle for Exams 5-9 takes about one year and includes the following stages:

1. Item Writing
2. Exam Construction
3. Pass Mark Panel
4. Grading
5. Appeals

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Committee Functions: Exams 5-9 1. Item Writing

- Mandatory one-day item writer training with hands-on practice and specific feedback
- Focus on requiring demonstration of *Learning Objectives*
- Exclusive use of constructed response items (i.e., "problem and essay questions")
- Encourage open ended items inclined toward synthesis rather than reiteration
- Detailed partial credit grading rubrics
- Peer review

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Committee Functions: Exams 5-9 2. Exam Construction

- Small group of experienced part committee members, part chair and vice chair reviews all items, model solutions and grading rubrics
- Best items selected with additional edits as necessary for clarity, style and convention
- Target long-term *Learning Objective* mix as documented in Syllabus
- Two rounds of full exam review including part chair and vice chair plus:
  - Round 1: First consultant and general officer
  - Round 2: Second consultant, general officer, Exam Committee chair and proof reader

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Committee Functions: Exams 5-9
3. Pass Mark Panel

- Small team of experienced part committee members, part chair, vice chair and general officers
- Estimate how many points the *Minimally Qualified Candidate (MQC)* will score on each item
  - The *MQC* is the hypothetical candidate who has mastered the *Learning Objectives* barely well enough to pass the exam.
  - The "MQC Document", which is maintained independent from the exam itself, details what the *MQC* will demonstrate under test conditions.
  - This document essentially defines the lowest level of performance that is required to pass.
- The total of the item-by-item *MQC* point estimates forms an *a priori* pass mark that will be the starting point for pass mark setting at the grading session.

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Committee Functions: Exams 5-9
4. Grading

- Each answer sheet is scored by two graders.
- Generally each grader is assigned to two items, but with candidate counts up, some parts now assign only one item per grading pair.
- Much grading is done prior to the session (in LAS VEGAS!). Grades are entered into standard Excel template and hand validated at the beginning of the grading session.
- Grading pairs must reconcile to within a narrow tolerance for every answer sheet. Answer sheets for candidates within several points of the pass mark are fully re-graded and reconciled.
- Graders provide item-by-item *ex post* estimates of *MQC* performance for the items they grade. These are considered along with the Pass Mark Panel's *a priori* estimates when setting the final pass mark.

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Committee Functions: Exams 5-9
5. Appeals

- Each appeal is evaluated first by the CAS office staff to eliminate invalid appeals, e.g. requests for re-grading.
- Valid appeals are forwarded to the part chair and vice chair, who then cascade to grading pair for feedback.
- Part chair responds directly to the chair with recommendations as well as impact on any change in scoring for the candidates.
- Exam Committee chair provides final formal response to candidates, which is delivered by the CAS office.
- Appeals resulting in a change in score from Fail to Pass are uncommon.

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Join In – Volunteer

- More volunteers WILL be needed over the next few years, both writers and graders
- Exam Committee work counts toward your Continuing Education requirements[1]
- LAS VEGAS
- Sign up via:
  - participation survey
  - direct contact to CAS
  - e-mail to Chair

[1]Applicability of material to category of CE and common sense guidelines apply to the recording of CE credits. See AAA publication for additional information.

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Future Changes

- Syllabus improvements
- Increased use of computers in testing
- Additional exam sittings (for 5 and 6)
- Higher level of testing (Bloom Taxonomy)
- CERA Designation
  - New candidates
  - Existing members

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Questions?

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