CAS Exam Committee Presents:

CAS EXAMINATION PROCESS

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2013 CAS Annual Meeting

Minneapolis, Minnesota

Agenda

- CAS Admissions Overview

- The Syllabus – it all starts here

- The Prelims – Exams 1 -4

- The Finals – Associateship and Fellowship exams

- Future Changes/Proposals

CAS Admissions

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                    │   CAS Board     │
                    │  of Directors   │
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                    ┌────────┴────────┐           │  CAS Office –   │
                    │ Vice President –│           │ Rich and Ashley │
                    │   Admissions    │           └─────────────────┘
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| Exam Committee | Syllabus Committee | Candidate Liaison Committee | Education Policy Committee |

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Exam Committee

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                        │      Chair      │
                        └────────┬────────┘
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                        │ Assistant Chair │
                        └────────┬────────┘
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    │ General Officers  │               │      Liaisons       │
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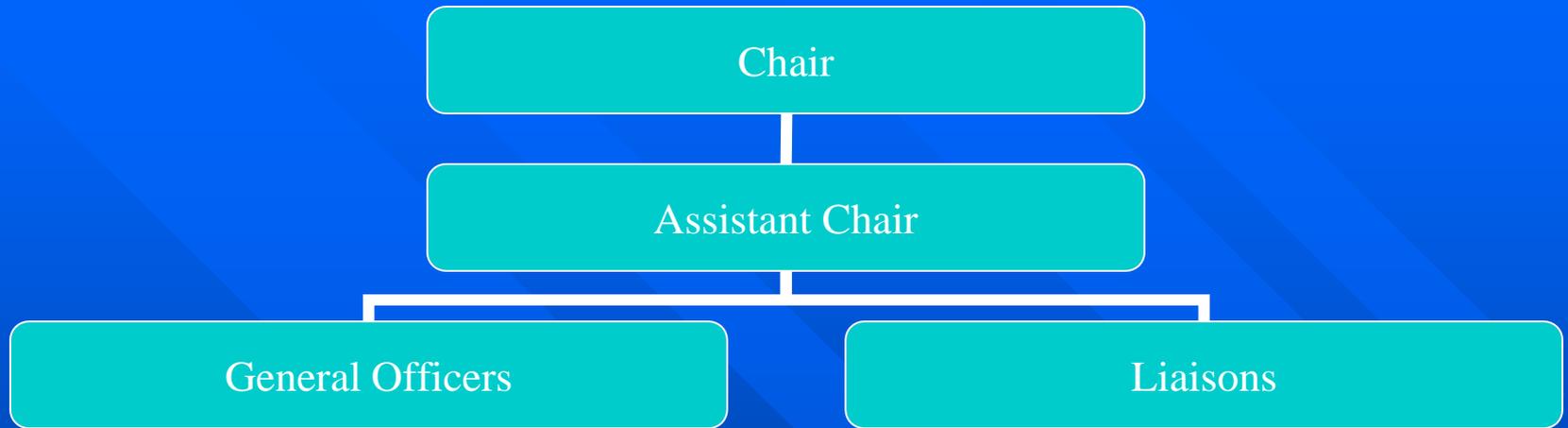
- Administration

- Recruiting

- Statistics (ST and LC)

- Spring Exams

- Fall Exams

- Grading Sessions

- Writing Sessions

- Syllabus Committee

- Candidate Liaison Committee

- Canadian Institute of Actuaries

Exams

General Officers
Fall/Spring/LC/ST

Part
Chairs

Vice Chairs

Membership roster as of
September 2013 includes
500+ CAS volunteers

Writing Teams

Grading Teams

Consultants

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 and Assistant Chair
  Manages day-to-day activities of committee, communications, appeals

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

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

SYLLABUS COMMITTEE

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)   – CAS Staff Liaison
  - Education Policy Committee   – Candidate Liaison Committee
  - Preliminary Examination Education Curriculum Committee

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

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

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 proposed Spring 2012
    - » Review Plan Executed Spring 2011 → Fall 2012
    - » Final changes for Fall 2013 approved in Fall 2012

Syllabus Committee
Recent Significant Developments and Considerations

EXAMINATION COMMITTEE

Preliminary Examination Overview

- Exams 1/P, 2/FM, 3F/MFE and 4/C are no longer joint exams after this year

- CAS Exam ST and LC are new next year and independent of SOA.

- Looking for combining ST, LC, 4, and VEE on Stats into a comprehensive multi-examination sequence on the preliminary exams

Committee Functions: Exams LC and ST
1.Item Writing

- 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.

Committee Functions: Exams ST and LC

2.Exam Construction

- All committee members, part chair and vice chair, review all items and model solutions to select questions in person.

- 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: Exam Committee reviews questions selected 6 months ago
  - Round 2:General officer from CAS, part chair, consultant and proof reader

Committee Functions: Exams ST and LC
4. Setting the Pass Mark

- 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 the pass mark discussion panel. The final pass mark is approved by the VP-Admissions and the CIA representative.

- Appeals on questions are reviewed by General Officer, Part Chair and selected committee members

- 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

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. Writing Summit
3. Exam Construction
4. Pass Mark Panel
5. Grading
6. Appeals

Committee Functions: Exams 5-9
1. Item Writing

- Mandatory half-day item writer training webinar 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

Committee Functions: Exams 5-9
2. Writing Summit

- CAS realizes that it is important to spend resources in exam construction as well as grading
- Writing done prior to 2-day onsite meeting
- Review questions as a group and offer immediate feedback to writer and chair
- Also should serve as writing training for writers so that initial questions improve over time
- Adds to a bank of future questions

Committee Functions: Exams 5-9
3. Exam Construction

- Small group of experienced part committee members, part chair, vice chair, and the Syllabus Committee senior part specialist reviews all items, model solutions and grading rubrics

- Best items selected with additional edits as necessary for clarity, style and convention

- Now including "test takers" to review the exam through the eyes of a candidate

- 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

Committee Functions: Exams 5-9
4. 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* <u>will</u> 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.

Committee Functions: Exams 5-9
5. Grading

- Each answer sheet is scored by two graders.

- Much grading is done prior to the session. 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.

- The candidates' actual results vs. expected are also evaluated to ensure that the proper pass mark is selected.

- The Examiners Report is crafted at the Grading session and is written by the graders and edited by the Exam Chairs

Committee Functions: Exams 5-9
6. 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.

Examination Committee
Recent Significant Developments and Considerations

VOLUNTEER PERSPECTIVE

Perspective of an Exam Committee Volunteer

- Grading
  - Process
  - Experience
- Writing Summit
  - Process
  - Example

Grading Process

- Graders are assigned to a partner, by request or at random

- Each grading pair is assigned one or two questions

- Phone conference to discuss grading process and timeline

- Using suggested answer key, graders evaluate ~30 papers, partners meet to reconcile
  - First opportunity to address alternative solutions

- Each grader grades all papers, in different order

Grading Process

- Graders must reconcile within 0.5 point before grading summit
- At summit, graders reconcile all papers to 0.25 points by reviewing answers point by point
  - Second opportunity to address alternative solutions
- After pass mark panel sets a preliminary passing score, all papers within a specified range of that score are reconciled exactly, by question sub-part

Grading Process

- Graders are asked for input on the Minimally Qualified Candidate (MQC) score for their question
  - May differ from pass mark panel or writers after seeing candidate responses
- Appeals – graders review all appeals. If a valid appeal is found, papers near the pass mark are reviewed for additional credit
  - Third opportunity for alternative solutions

Grader Experience

- Stay involved with exam process
- More confidence in the exam process
- Networking: old friends, new co-workers, actuarial leaders
- Vegas, baby!
- Time commitment: 20-40 hours of grading, plus Vegas summit

Writing Summit

- Writing high level Bloom's Taxonomy questions is difficult
  - Most old exam questions are no longer a guide
  - Easy to lead candidates to a suggested solution
  - Easy to make the question too open ended
- Writing summit offers the opportunity to expand, limit, or modify first draft questions

Writing Summit Process

- Each writer is assigned a partner, learning objective, and key knowledge statements
  - Objectives are given a maximum number of questions and minimum number of points for draft questions (i.e. no 0.75 point problems)
- Submitted questions are reviewed at the summit in group setting
- Result: A more thorough writing process

Writing Summit Example

- **First Draft:**
  - (1.5 points): Describe three problems with the National Flood Insurance Program

- **Questions:**
  - Should this be worth 1.5 points?
  - Should we ask candidates to "Explain", "Describe", or "Briefly Describe"?
  - Isn't this a boring question?

Writing Summit Example

- A higher level Bloom's question:
  - Recommend 3 changes for the National Flood Insurance Program to address current solvency issues.
- Why this is better:
  - Allows candidates to use the entire syllabus
  - No longer a wrote-memorization question
  - More alternative solutions

Join In – Volunteer

- More volunteers ARE needed right now; both writers and graders
- LAS VEGAS (writing and grading)
- Sign up via:
  - participation survey
  - direct contact to CAS
  - e-mail to recruiting General Officer:
    - » Rhonda Walker - rpwalkerbhnj@verizon.net

Questions?