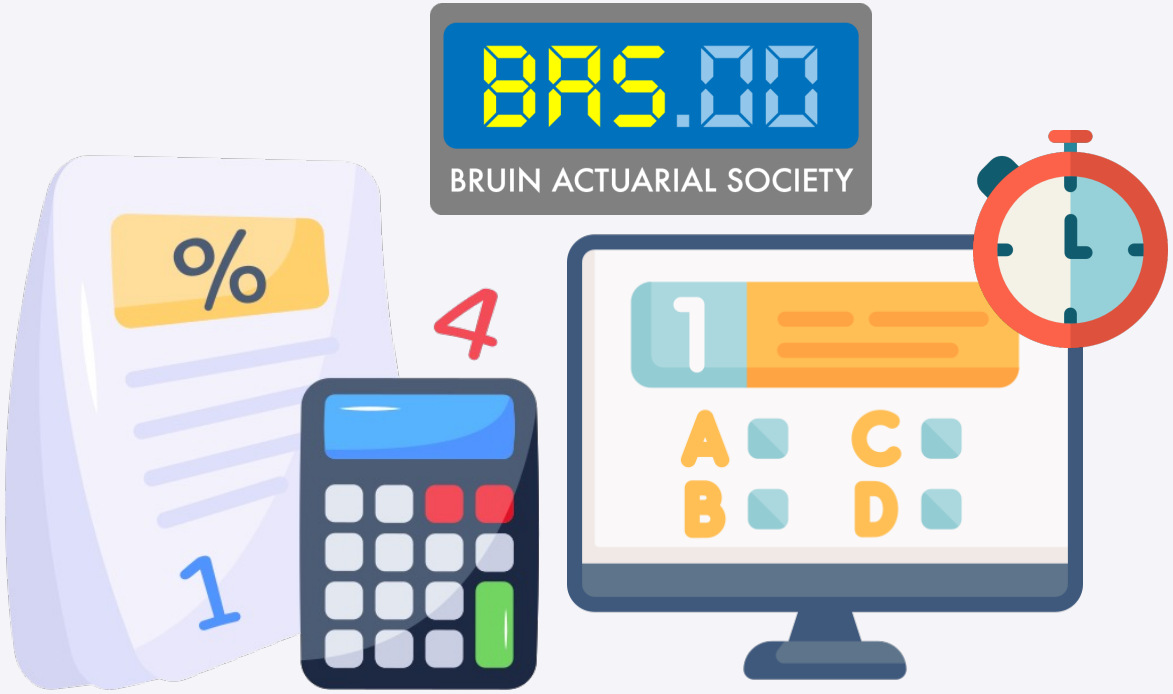


Introduction to Actuarial Exams Workshop

Bruin Actuarial Society

Agenda

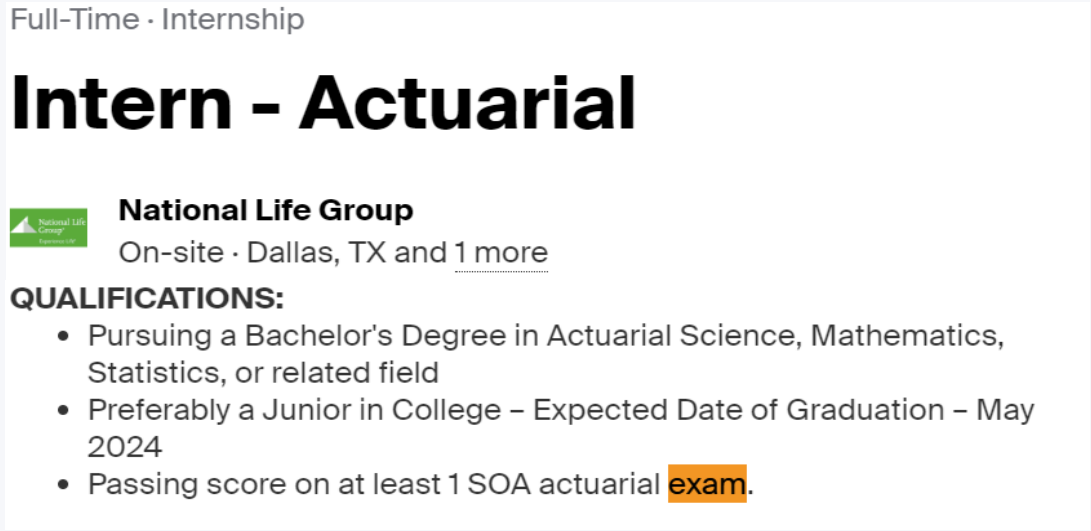
1. Introduction to Actuarial Exams
2. Exam Registration
3. Exam Study Plan
4. What To Know About Exam Day

01.

Introduction to Actuarial Exams

Why Take Actuarial Exams?

- Exams are necessary to be an actuary
  - Many internships are given only to those with exams passed
- More information on BAS, SOA, and CAS websites
- Typical exam schedule:
  - First internship: 1-2 exams (P or FM)
  - Before graduation: 2-4 exams (ie. SRM/PA, FAM/ALTAM/ASTAM)



Full-Time · Internship

Intern - Actuarial

National Life Group

On-site · Dallas, TX and 1 more

QUALIFICATIONS:

- Pursuing a Bachelor's Degree in Actuarial Science, Mathematics, Statistics, or related field
- Preferably a Junior in College – Expected Date of Graduation – May 2024
- Passing score on at least 1 SOA actuarial exam.

SOA vs. CAS

- For Health, Life, & Retirement
- Associate of the Society of Actuaries (ASA) -> first 7 exams
- Fellow of the Society of Actuaries (FSA) -> 6 specialty tracks, 3 exams

- For Property and Casualty
- Associate of the Casualty Actuarial Society (ACAS) -> first 7 exams
- Fellow of the Casualty Actuarial Society (FCAS) -> 3 exams

Exam P/1: Probability

- Fundamental probability tools used for quantitatively assessing risk
- Usually the first actuarial exam (can also take FM first)
- Corresponds to Math 170E (or Math 170A/B)
- Exam registration fee: $250
- 3-hour exam, 30 multiple-choice questions
- Average passing rate: 42%
- Pass mark: 71% (equivalent to >22/30)
- Score scale: 0-10 (at least 6 to pass)

Exam FM/2: Financial Mathematics

- Fundamental concepts used in calculating present/accumulated values for cash flows
- Can also be taken as a first exam
- Corresponds to Math 177
- Exam registration fee: $250
- 2.5-hour exam, 30 multiple-choice questions
- Average passing rate: 48%
- Pass mark: 70% (equivalent to >22/30)
- Score scale: 0-10 (at least 6 to pass)

Recent Changes

- Exam P and FM will require less preparation (more accessible and elimination of outdated content)
- Exam IFM eliminated (shift in ASA pathway towards data analytics and certain key concepts will be tested elsewhere in the pathway)
- Exams LTAM and STAM will be replaced with new exams:
  - Fundamentals of Actuarial Mathematics (FAM)
  - Choice of either Advanced Long-Term Actuarial Mathematics (ALTAM) or Advanced Short-Term Actuarial Mathematics (ASTAM)
- Introduction of a new course- Introduction of Advanced Topics in Predictive Analytics (ATPA) (increasing our already strong data analytics coverage)
- Two new e-Learning modules (offering an increasing emphasis on AQ/EQ topics) with a shorter, streamlined FAP course – Pre-Actuarial Foundations and Actuarial Science Foundations
- VEE requirements, Exam SRM, Exam PA, and APC seminar remain unchanged
- For more information, see this link

Recent Changes

- IFM/ATPA Considerations
- The requirements for ASA, and therefore for FSA by implication, will be having credit for either IFM or ATPA
- Any candidate earning an ASA based on IFM will not be required to pass ATPA to earn an FSA
  - The last administration of IFM was in November 2022
  - Starting in 2023, only ATPA will be available

02.

Exam Registration

Exam Registration: Step 1

- Make an account and check the exam schedule on SOA
  - Check the SOA Exam Schedule (look for the registration deadline and CBT dates)
    - Exam registration typically opens ~6 weeks before the registration deadline

Exam Registration: Step 1

- Exam P is offered in *ODD* months
- Exam FM is offered in *EVEN* months
- Exam fees are NOT refundable
  - So plan ahead of time!!
- Make sure you avoid time conflicts
  - Example: finals season
  - Recommended time for exams: July-October (over summer break)

Exam Registration: Step 2

- Register for CBT and finish the payment to receive emails
  - https://www.soa.org/education/exam-req/registration/edu-registration/
- First email will be immediately sent after registration as Order Confirmation
  - This will contain…
    - Order number
    - Candidate/eligibility ID (needed for registration on Prometric)

Sample Email Confirmation

Subject: Confirmation of computer-based **Probability: English, U.S./Intl,#0000000096810355**

Your appointment for the computer-based **Probability: English, U.S./Intl** is confirmed. Please find the confirmation details that follow:

Confirmation:	**0000000096810355**
Program:	**SOA/CIA**
Exam Code:	**P1EnL**
	Probability: English, U.S./Intl
Exam Date:	**13 Sep 2021**
Exam Time:	**12:00**

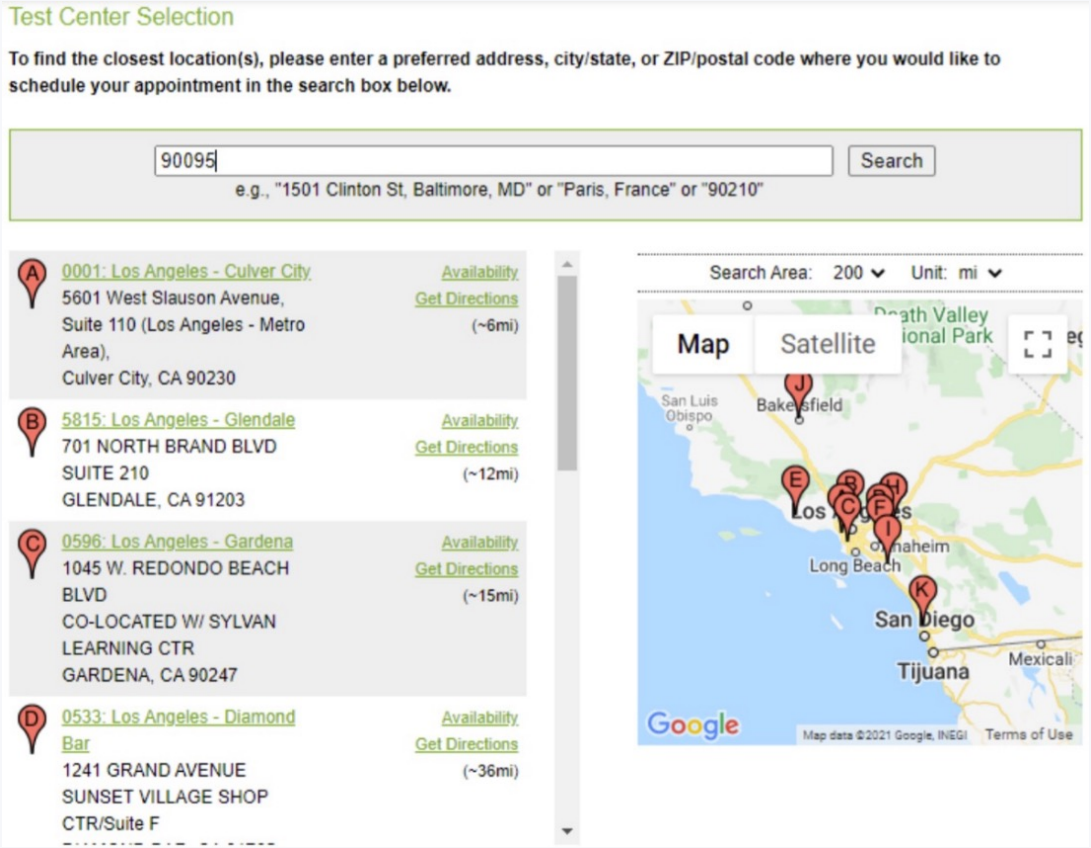
Prometric Test Center: **# 5863**
Los Angeles - Glendale
701 NORTH BRAND BLVD
SUITE 210
GLENDALE CALIFORNIA 91203
UNITED STATES

Exam Registration: Step 3

- Schedule a seat at Prometric Center *IMMEDIATELY* after you receive the email and wait for the *letter of appointment confirmation*
- For more detailed information, refer to this link
- The closest Prometric Testing Center to UCLA is a 14-minute drive: 5601 W Slauson Ave, Los Angeles, CA 90056

Appointment Availability

- Go to https://www.prometric.com/soa and click on “Actions” and then “Locate”
  - Check the availability of exam centers before registering



Questions?

03.

Exam Study Plan

Corresponding UCLA Courses

SOA	CAS	Topic	UCLA Course(s)
Exam P	Exam 1	Probability	Math 170E
Exam FM	Exam 2	Financial Mathematics	Math 177
VEE Economics		Microeconomics & Macroeconomics	Econ 1/101 Econ 2/102
VEE Accounting & Finance		Accounting & Finance	Mgmt 1A (2021)/1B Mgmt 130A/Math 174E
VEE Mathematical Statistics	-	Mathematical Statistics	Stats 100B (2021)/201B/ Math 170S (2022)/ Biostats 200A

Exam Study Plan: Self Study

- Free Resources
  - Online study manuals (P and FM) and free resources (Marcel Finan)
  - Benefits
    - Lower cost
    - Flexibility
- Alternatives
  - ASM and ACTEX study manual (~$100-150)
  - E-learning courses (The Infinite Actuary, Coaching Actuaries) (~$300)
  - Benefits
    - More comprehensive
    - Abundance of resources

Studying for Exams

- Official recommended study time = 100 hours per exam hour
  - 3-hour test = 300 hours of studying
- Some study resources:
  - Paper Manuals: ACTEX, ASM
  - Online Seminars: Coaching Actuaries (CA), The Infinite Actuary (TIA)
  - Free Resources: Dr. Finan's study manual for P/FM, old manual from Boelter Library
    - Warning… may be outdated as exams have changed in recent years
- Exam Prep tab on our website: https://www.math.ucla.edu/~actuary/examPrep.html
  - Contains reviews of study resources as well as links to those that are free

Exam Study Plan: Step 1

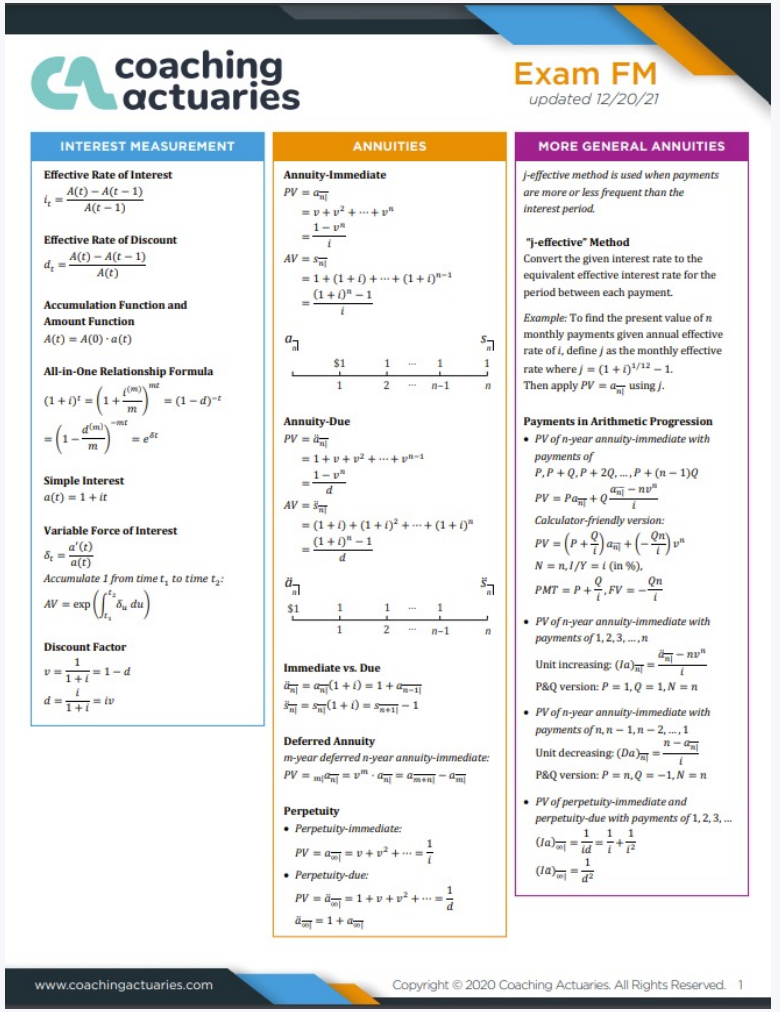
- Step 1: Learn the basic exam topics (2-3 months)
- Follow the dated syllabus for your exam found on the SOA website
- Create a study schedule to learn each topic in a timely manner
- Make detailed notes on each topic with emphasis on specific formulas
- Note down difficult topics to revisit after learning the rest of the material

Exam Study Plan: Step 2

- Step 2: Practice, practice, and practice!! (1-2 months)
- Do free mock test found online or practice tests from CA, TIA, etc. and sit for 3 hours each time
- Mark down incorrect questions to review after each mock test
- Note new topics encountered in mock test to go over
- Keep track of progress on mock tests and understand your goals for each attempt

Exam Study Plan: Step 3

- Step 3: Final review and formula sheet (1 week)
- Create concise notes and formula sheet to review at testing site before exam
- Coaching Actuaries has free formula sheets for each exam
- Again, do a 3-hour mock exam (if possible, do it at the same time as your real exam)



coaching actuaries

Exam FM
updated 12/20/21

INTEREST MEASUREMENT

Effective Rate of Interest

$$i_t = \frac{A(t) - A(t-1)}{A(t-1)}$$

Effective Rate of Discount

$$d_t = \frac{A(t) - A(t-1)}{A(t)}$$

Accumulation Function and Amount Function

$$A(t) = A(0) \cdot a(t)$$

All-in-One Relationship Formula

$$(1+i)^t = \left(1 + \frac{i^{(m)}}{m}\right)^{mt} = (1-d)^{-t}$$
$$= \left(1 - \frac{d^{(m)}}{m}\right)^{-mt} = e^{\delta t}$$

Simple Interest

$$a(t) = 1 + it$$

Variable Force of Interest

$$\delta_t = \frac{a'(t)}{a(t)}$$

Accumulate 1 from time t_1 to time t_2:

$$AV = \exp\left(\int_{t_1}^{t_2} \delta_u \, du\right)$$

Discount Factor

$$v = \frac{1}{1+i} = 1 - d$$
$$d = \frac{i}{1+i} = iv$$

ANNUITIES

Annuity-Immediate

$$PV = a_{\overline{n}|} = v + v^2 + \cdots + v^n = \frac{1 - v^n}{i}$$
$$AV = s_{\overline{n}|} = 1 + (1+i) + \cdots + (1+i)^{n-1} = \frac{(1+i)^n - 1}{i}$$

$a_{\overline{n}|}$ $s_{\overline{n}|}$

$1 1 \cdots 1 1$
$1 2 \cdots n-1 n$

Annuity-Due

$$PV = \ddot{a}_{\overline{n}|} = 1 + v + v^2 + \cdots + v^{n-1} = \frac{1 - v^n}{d}$$
$$AV = \ddot{s}_{\overline{n}|} = (1+i) + (1+i)^2 + \cdots + (1+i)^n = \frac{(1+i)^n - 1}{d}$$

$\ddot{a}_{\overline{n}|}$ $\ddot{s}_{\overline{n}|}$

$1 1 1 \cdots 1$
$1 2 \cdots n-1 n$

Immediate vs. Due

$$\ddot{a}_{\overline{n}|} = a_{\overline{n}|}(1+i) = 1 + a_{\overline{n-1}|}$$
$$\ddot{s}_{\overline{n}|} = s_{\overline{n}|}(1+i) = s_{\overline{n+1}|} - 1$$

Deferred Annuity

m-year deferred n-year annuity-immediate:

$$PV = {}_{m|}a_{\overline{n}|} = v^m \cdot a_{\overline{n}|} = a_{\overline{m+n}|} - a_{\overline{m}|}$$

Perpetuity

- *Perpetuity-immediate:*

$$PV = a_{\overline{\infty}|} = v + v^2 + \cdots = \frac{1}{i}$$

- *Perpetuity-due:*

$$PV = \ddot{a}_{\overline{\infty}|} = 1 + v + v^2 + \cdots = \frac{1}{d}$$
$$\ddot{a}_{\overline{\infty}|} = 1 + a_{\overline{\infty}|}$$

MORE GENERAL ANNUITIES

j-effective method is used when payments are more or less frequent than the interest period.

"j-effective" Method

Convert the given interest rate to the equivalent effective interest rate for the period between each payment.

Example: To find the present value of n monthly payments given annual effective rate of i, define j as the monthly effective rate where $j = (1+i)^{1/12} - 1$.
Then apply $PV = a_{\overline{n}|}$ using j.

Payments in Arithmetic Progression

- *PV of n-year annuity-immediate with payments of* $P, P+Q, P+2Q, \ldots, P+(n-1)Q$

$$PV = P a_{\overline{n}|} + Q\frac{a_{\overline{n}|} - nv^n}{i}$$

Calculator-friendly version:

$$PV = \left(P + \frac{Q}{i}\right) a_{\overline{n}|} + \left(-\frac{Qn}{i}\right) v^n$$

$N = n$, $I/Y = i$ (in %),

$$PMT = P + \frac{Q}{i}, FV = -\frac{Qn}{i}$$

- *PV of n-year annuity-immediate with payments of* $1, 2, 3, \ldots, n$

Unit increasing: $(Ia)_{\overline{n}|} = \frac{\ddot{a}_{\overline{n}|} - nv^n}{i}$

P&Q version: $P = 1, Q = 1, N = n$

- *PV of n-year annuity-immediate with payments of* $n, n-1, n-2, \ldots, 1$

Unit decreasing: $(Da)_{\overline{n}|} = \frac{n - a_{\overline{n}|}}{i}$

P&Q version: $P = n, Q = -1, N = n$

- *PV of perpetuity-immediate and perpetuity-due with payments of* $1, 2, 3, \ldots$

$$(Ia)_{\overline{\infty}|} = \frac{1}{id} = \frac{1}{i} + \frac{1}{i^2}$$
$$(Ia)_{\overline{\infty}|} = \frac{1}{d^2}$$

www.coachingactuaries.com

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04.

What to Know About Exam Day

Exam Day

- Get enough sleep the night before the exam day
- What the test center provides:
  - Pencils (ask for more)
  - Ear plugs
  - Scratch paper
- What you should bring:
  - Approved calculator(s) (check SOA website)
  - Valid non-expired government-issued ID with a photo & signature
  - Short notes, snacks, jacket

Exam Day

- Arrive at the test center 30 minutes before the exam
- Tentative pass/fail results will be given right after the exam (never wrong)
  - Official test scores will be confirmed after ~8 weeks
- Check SOA website for…
  - Passing candidate names/numbers/percentages
  - Online transcript

Questions?

AND THAT'S A WRAP!

KEY TAKEAWAYS

- ✓ Actuarial exams are important for internships and career development
- ✓ Consider first taking Exam P or FM
- ✓ Register early and make + follow a study plan

ANNOUNCEMENTS

- ✓ Coaching Actuaries Tutorial Workshop on Thursday 2/9 @6pm in MS 6627

ATTENDANCE

https://forms.gle/muyhhP9LMdPh3sqWA

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