

THE ACTUARIAL SURVIVAL GUIDE – YOUR DESIGNATION

Edition 2.1

THE UNIVERSITY OF MANITOBA ACTUARIAL CLUB

SECTION FOUR

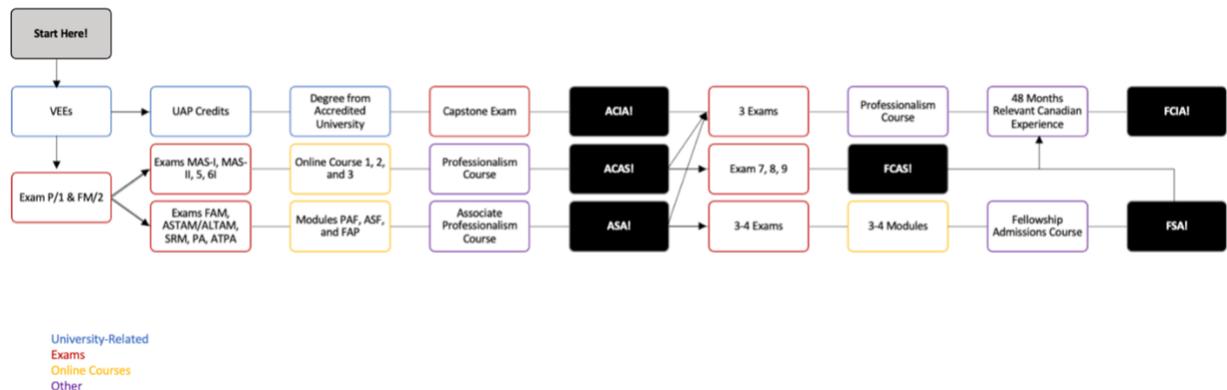
OTHER REQUIREMENTS & INFORMATION

INTRODUCTION

By *Katherine Stobbe*

You may have noticed that there are more requirements than just the exams! This section will first compare the requirements for each actuarial society, and then break down exactly what they are, when to complete them, and how they work. We will also include some information on university accreditation!

PATHWAY BREAKDOWN



| | Society of Actuaries | Casualty Actuarial Society | Canadian Institute of Actuaries |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description | Society for life, health, or pension actuaries | Society for property and casualty actuaries | Governing body for actuaries in Canada |
| Website | https://www.soa.org/Canada | https://www.casact.org | https://www.cia-ica.ca/home |
| Available Designations | Associate of the Society of Actuaries (ASA) Fellow of the Society of Actuaries (FSA) Chartered Enterprise Risk Analyst (CERA)*** | Associate of the Casualty Actuarial Society (ACAS) Fellow of the Casualty Actuarial Society (FCAS) Chartered Enterprise Risk Analyst (CERA)*** | Associate of the Canadian Institute of Actuaries (ACIA) Fellow of the Canadian Institute of Actuaries (FCIA) |
| Average Timeline* | 5.22 years | 6 years | No Data |
| Exam Requirements | P FM FAM (made up of FAM-S & FAM-L) ASTAM ALTAM SRM ATPA (project-based assessment) PA (project based assessment) | P/1 FM/2 MAS-I MAS-II Exam 5 Exam 6C | N/A |
| Exam Equivalencies | FAM-S & ASTAM = Former STAM FAM-L & ALTAM = Former LTAM ATPA = IFM Replacement | SOA Exam P = CAS Exam 1 SOA Exam FM = CAS Exam 2 | N/A |
| Exam Format | CBT MC + WA at designated testing center | CBT MC + WA at designated testing center | N/A |
| University Credit Program | Yes, UEC program | Yes, UAP program | Yes, UAP program |
| i.e. Is there a program which provides exam credit for university courses? | | | |
| Exams Eligible for University Credit | FM Others TBD | P/1 FM/2 | P FM IFM STAM LTAM SRM |
| Univeristy Degree Designation | No | No | Yes |
| i.e. Can completing my degree lead to this designation? | | | |
| Other Requirements** | 3 VEE: Economics, Accounting & Finance, Mathematical Statistics 3 Modules: Pre-Actuarial Foundations Module; Actuarial Science Foundations Module; Fundamentals of Actuarial Practice Associate Professionalism Course | 2 VEE: Economics, Accounting & Finance 3 Online Courses: Risk Management & Insurance Operations; Insurance Accounting, Coverage Analysis, Insurance Law & Insurance Regulation; Data Concepts Professionalism Course | Capstone exam Professionalism Workshop |
| Notes | | | Eligibility can be attained through either: -Attaining ASA or ACAS credentials OR -Completing degree at an accredited university AND obtaining all UAP* credits AND writing the capstone exam |
| Transferability | ASA can be used to attain ACIA | ACAS can be used to attain ACIA | ACIA cannot be used to attain ASA or ACAS |
| Timeline* | 7.32 years | 7.54 years | No Data |
| Specialty Track Options | Yes, 6 options | No | No |
| Exam Requirements | 3-4 total, dependent on track | Exam 7 Exam 8 Exam 9 | 3 total, exact details TBD |
| Exam Format | WA at designated testing center | WA at designated testing center | Remotely proctored, open book |
| University Credit Program | No | No | No |
| i.e. Is there a program which provides exam credit for university courses? | | | |
| Exams Eligible for University Credit | None | None | None |
| Univeristy Degree Designation | No | No | No |
| i.e. Can completing my degree lead to this designation? | | | |
| Other Requirements | 3-4 Modules, dependent on track Fellowship Admissions Course | None | 3 Modules Professionalism Course 48 months relevant Canadian experience Required to sign off on actuarial evaluations in Canada. |
| Notes | ASA is required to obtain FSA. | ACAS is required to obtain FCAS | Eligibility can be attained through either: -Attaining FSA/FCAS credentials through SOA/CASAND completing 48 months relevant Canadian experience OR -Attaining ASA/ACAS credentials through SOA/CAS AND completing CIA fellowship exams, modules, and professionalism course AND completing 48 months relevant Canadian experience OR -Attaining ACIA credentials through CIA AND completing CIA fellowship exams, modules, and professionalism course AND completing 48 months relevant Canadian experience |
| Transferability | FSA can be used to attain all exam/module requirements of FCIA. Transferrable internationally. | FCAS can be used to attain all exam/module requirements of FCIA. Transferrable internationally. | FCIA cannot be used to attain FSA or FCAS Transferrable internationally |
| Pros | -Transferrable to an FCIA -Examinations are eligible for study days, study bonuses, paid study material, etc | -Transferrable to an FCIA -Examinations are eligible for study days, study bonuses, paid study material, etc | -Since an FCIA designation is required to sign off on actuarial evaluations in Canada, it is generally required of actuaries to receive this designation, either through CIA exams, or SOA/CAS exams. -More flexibility in ways to attain designation -Potentially fewer exams |
| Cons | -Several exams -Likely will be required to also attain FCIA | -Several exams -Likely will be required to also attain FCIA | -Accrediting preliminary exams can make writing upper-level exams harder since one would lack the experience of writing actuarial examinations -FCIA cannot be used to attain FSA/FCAS -Salary is generally based on number of exams passed, and some companies do not count accredited exams as a passed exam |
| Notes | SOA also has Micro-Credentials, which act as "check-points" or "segments" that make up the ASA Credential. -Pre-Actuarial Foundations: VEE Accounting & Finance, VEE Economics, Exam P, Exam FM, Pre-Actuarial Foundations Module -Actuarial Science Foundations: Pre-Actuarial Foundations Micro-Credential, VEE Mathematical Statistics, Exam SRM, Exam FAM, Actuarial Foundations Module -Data Science for Actuaries: Exam SRM, Exam PA, Exam ATPA | | |
| Footnotes | * Average travel time according to http://www.actuarial-lookup.com/travel-times ** See our "VEE Guide" for more information on completing the VEE requirements ***Not covered in this chart | | |

VALIDATION BY EDUCATIONAL EXPERIENCE (VEE)

By Katherine Stobbe

What are VEE Credits? VEE (Validation by Educational Experience) are educational requirements for ASA/ACAS designations.

How do I finish VEE credits? VEEs can be completed by completing specific university courses with the required grades through an approved university, or by completing an online course and exam through an approved organization. You must apply for VEE credit with the SOA once you have completed them.

How do I apply for VEE credits? Once you have completed the VEE course(s), you must apply and pay for the VEE to be recognized through the SOA website. Some online courses (such as Coaching Actuaries) will automatically send your VEE results to the SOA, and thus a separate application is not required. You must apply for each VEE separately.

When should I apply for VEE credits? You must complete two SOA/CAS exams before you are eligible to apply for VEE credits. We recommend waiting until you are employed full-time before applying for VEE credits since most employers will reimburse the application fee.

What is the difference between the University Credit and Other options? Completing VEEs at an approved university allow you to complete them at the same time as your university degree. Completing VEEs as an online course will require you to go through a separate organization and pay an additional fee (i.e. a fee that is not simply part of a "tuition" payment). The format of online VEE courses vary, with some courses including assignments and quizzes, and the format of the proctored final will vary, with some courses using remote proctoring and others using a testing center.

Where can I find more info?

SOA: <https://www.soa.org/education/exam-req/edu-vee/>

CAS: <https://www.casact.org/exams-admissions/validation-educational-experience>

General Directory: <https://www.soa.org/education/exam-req/instructions-for-vee-directory/>

VEE Registration: <https://www.soa.org/education/exam-req/registration/edu-registration/>

COMPARING VEE OPTIONS

| VEE | General Info | | University Credit | | Other Options |
|-------------------------|--------------|-----------------------|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Society | U of M Course | Grade Requirement | Online Courses | Links |
| Economics | SOA & CAS | ECON 1010 + ECON 1020 | B or higher | Coaching Actuaries Microeconomics + Coaching Actuaries Macroeconomics ACTEX VEE Economics | https://www.coachingactuaries.com/vee-microeconomics/ + https://www.coachingactuaries.com/vee-macroeconomics/ OR https://www.actexamdriver.com/orderselection.aspx?id=453139680 |
| Accounting & Finance | | | | Coaching Actuaries Accounting + Coaching Actuaries Finance OR The Infinite Actuary Accounting and Corporate Finance OR ACTEX VEE Finance | https://www.coachingactuaries.com/vee-accounting/ + https://www.coachingactuaries.com/vee-finance/ OR https://www.theinfiniteactuary.com/ACF OR https://www.actexamdriver.com/OrderSelection.aspx?terms= |
| Mathematical Statistics | SOA & CAS | FIN 2200 + ACC 1100 | B or higher | Coaching Actuaries Mathematical Statistics Course OR The Infinite Actuary Mathematical Statistics OR ACTEX VEE Mathematical Statistics | https://www.coachingactuaries.com/vee-mathematical-statistics/ OR https://www.theinfiniteactuary.com/MS OR https://www.actexamdriver.com/OrderSelection.aspx?terms=actex%20vee%20Mathematical |
| | SOA | IDM 4050* | B or higher | | |

*Note this course is not always offered as "Mathematical Statistics". Make sure to check the course title and description

SURVIVING THE EXAMS

PRELIMINARY SOA/CAS EXAMS

EXAM P/1

By *Devin Kinley*

Most students preparing for this exam will be taking the courses STAT 2400 and STAT 2800. These courses are pretty good at teaching you the theory you will need to know in order to pass Exam P. Unfortunately, these courses will not give you the same type of questions you will see in Exam P.

I believe taking the courses then taking practice tests on ADAPT for 3-4 weeks is sufficient to pass Exam P. I did about 20 Exam P practice exams, this was probably overkill but I passed.

For those of you who will be taking those courses here are a couple of tips specifically for that course:

- You will have to do a lot of proofs. I used to hate proofs but take this opportunity to understand the proofs rather than memorize them
- Generally the textbook questions suck. If you are finding them too hard, go online to practice questions or use the ACTEX study manual. I found this particularly useful when doing permutations and combinations

Here are some concepts that are important to highlight for Exam P:

General Probability

All I will say in this section is that if you can understand how Bayes' Theorem works then you are probably ready to move onto the next section. Both draw out Bayes' Theorem and prove it mathematically.

$$\begin{aligned}
P(E_i|A) &= \frac{P(A \cap E_i)}{P(A)} \\
&= \frac{P(E_i)P(A|E_i)}{P(A)} \text{ (by multiplication rule of probability)} \\
&= \frac{P(E_i)P(A|E_i)}{\sum_{j=1}^n P(E_j)P(A|E_j)} \text{ (by the result of theorem of total probability)}
\end{aligned}$$

Distributions

Understanding what each distribution does and how they are related to one another will absolutely save you time. Success in the actuarial career cannot be achieved by just performing the mathematics without understanding the concepts. You must always understand the concepts. Looking at the proofs for these formulas and how they were developed is massively beneficial.

Univariate Probability Distributions

The survival function ($S(x)$) is very very important for Exam P. This is one of those functions they hardly touch on in the stats courses. It becomes especially helpful for calculating expected losses given there is a deductible and a limit.

Another function that is sometimes useful is the moment generating function. I'll be honest, I hardly used the formula but after revisiting the material I can definitely see the value in using this formula. I recommend familiarizing yourself with this formula because in certain situations where you have to calculate variance or moments of a function, this function could prove to be useful and time-saving.

Multivariate Probability Distributions

In statistics, there are a lot of tricks that can save you a lot of time. Since in the actuarial exams you are given such little time to complete each question it is very important that you learn as many of these tricks as you can. These tricks you will come across when doing practice problems so all I can recommend is to record each time-saving trick and do a lot of practice questions.

You have to be able to recognize a distribution when given to you. For example a type of

question you may see is "Find the expected value of $f(x,y) = \frac{e^{-\left(\frac{3x+2y}{6}\right)}}{6}$ ".

However, we can see that this function is just two independent exponential distributions multiplied together. By only doing a few calculations I know $f(x) = \frac{e^{-x/2}}{2}$ and $f(y) = \frac{e^{-y/3}}{3}$ meaning that $E(x) = 2$ and $E(y) = 3$, so $E(x,y) = E(x) * E(y) = 6$

Had I not recognized that this was two independent exponential distributions multiplied together then it would have taken me much more time.

Some of these tricks are found on the ADAPT cheat sheet. The ADAPT cheat sheet is a little more than 3 pages; not learning every part of it would be a mistake.

Insurance and Risk Management

This section boils down to really one beautiful formula that you will absolutely use.

Expected Value of Payment, Y

$$\mathbf{E(Y)} = \int_d^{d+u} \mathbf{S(x)dx}$$

- Where $S(x)$ is the survival function $(1-F(x))$
- d = deductible
- u = limit

EXAM FM/2

By Alex Morakis

After completing Interest Theory, you have learned most of the syllabus that is on Exam FM. Typically students either take Exam P or FM first, the decision is up to you. The course does a pretty good job in preparing you for the exam, however I believe additional practice will increase your probability of succeeding on exam day. Here are some things I would recommend for preparing for the exams:

Study Options

- The SOA publishes sample questions for every preliminary exam on their website. They're representative of exam questions and they are also free.
- The ASM Manual is a great resource for more practice questions as well as solved examples. If you purchase the manual, you get access to GOAL, a question bank of exam style questions. There is an ASM manual in reserve in the Drake Library. Currently the Warren Centre provides a subscription to GOAL if you are enrolled in Interest Theory.
- Coaching Actuaries (CA) also has a comprehensive question bank (Adapt) for Exam FM. Adapt provides summaries which show which areas of the syllabus you need to improve

on which is a great feature. There is also a study manual and video lectures available within CA, however it is more expensive (there is a full-time student discount!).

- TIA has comprehensive video lectures for all the material, practice questions and practice exams. It is also an expensive option, however there is a full-time discount available.

Personally I used the SOA sample questions, Adapt (CA) question bank as well as referred to course notes and the ASM manual in order to prepare for the exam. With most of the material being covered in the course, I was able to dive right in to practice questions about a month before the exam.

Exam Tips

- There are a few additional study notes on the FM syllabus that are tested on the exam. They are qualitative type questions. Make sure you are familiar with them for potential easy points on the exam.
- Make sure you are focusing on your mistakes when practicing questions, however uncomfortable and frustrating that it is.
- Get familiar with your calculator! On a TI-30 calculator, one shortcut that saved a lot of time was storing a discount rate (v) on $\text{Sto}>$ when calculating the present value of an annuity. The TVM functions on a Ba-II plus can also be a timesaver for some questions.
- If a question is asking to rearrange a formula, it can be faster to plug in numbers to each possible solution instead of solving the actual question.

EXAM STAM

By *Dillon Doan*

STAM (Short-Term Actuarial Mathematics) is regarded as one of the advanced preliminary exams. The exam focuses on statistical theories and methods used by actuaries in reserving and ratemaking. This exam is somewhat of an extension of exam P, with many of the probability topics going much more in depth. This exam consists of 35 multiple choice questions, with a time limit of three-and-a-half hours. It may be beneficial to take ACT 4020 (STAM 1) and ACT 4030 (STAM 2) if you are studying at the University of Manitoba. These two courses will cover everything that you will need to know for this exam, however I still suggest supplementing these courses with a study aid (Coaching Actuaries, TIA, ASM, etc.). Relative to FM, P, or IFM there is much more material that will need to be covered for this exam so one should plan their study schedule accordingly. You know what works for you; however, I do suggest leaving about 1.5 months to work on questions. Like many of the preliminary MC exams, doing many practice problems is key. We will now discuss two potential options for using as a study aid.

Study Options

Two very popular aids for this exam are Coaching Actuaries (CA) and The Infinite Actuary (TIA). Both will be very good options to review/learn the material and both have an extensive question bank with great question systems. I personally used TIA, as I thought the videos provided a greater explanation of the more complex topics within STAM. Additionally, the TIA question bank was greater in difficulty, which is frustrating at first, but is appreciated closer to the exam day as they are very representative of the exam itself.

Exam Tips

- This exam is very calculation/math intensive, so make sure to brush up on your calculus and basic probability skills (There is a review in the first section of TIA)
- Practice is key, do as many practice problems you need to feel comfortable.
 - There are many old exams to practice from. However, the question bank and exams provided by TIA are more than sufficient.
 - Make sure you understand how and why you got questions wrong when you are studying. You'll learn much more from mistakes
- Take breaks. The exam is grueling and mentally taxing. Make sure to take time for yourself.
- The day before the exam, take it easy. Brush up on formulas, do a couple of questions you've gotten wrong but don't do anything too intense.
- On the exam, know when to take the loss. Remember that each question is worth the same marks, so devote more time to questions that you know you will get right. Skip questions if you have no clue how to approach it.

EXAM LTAM

By Mark SanFillippo with additional CBT tips by Lynette Rutbeek

LTAM (Long-Term Actuarial Mathematics) is notorious for being one of the most rigorous preliminary SOA exams due to the vast amount of content contained within its syllabus compared to the other preliminary exams. Furthermore, LTAM is the second-longest preliminary exam, consisting of four hours of multiple-choice and long answer questions (Exam PA is the longest preliminary exam, lasting five hours and fifteen minutes). It is beneficial to take at least one (if not both) of the Models courses (ACT 3130 and ACT 3230) offered by the University of Manitoba to introduce yourself to the material for this exam. Regardless of whether you have prior knowledge from the courses, it is suggested that you study for at least three months to master the material for Exam LTAM. The remainder of this document will provide you with some study tips that will help you succeed in passing Exam LTAM.

Study Material

There are two main options for study material to use for this exam, TIA (The Infinite Actuary) and CA (Coaching Actuaries). Both are formidable options that provide you with extensive notes and videos detailing the course material, a bunch of practice questions to help you master the material, as well as tips and tricks that are valuable for you to use during the exam. In my opinion, TIA is the better option because the difficulty of the practice questions and practice exams very closely resemble the difficulty of the actual exam.

Timeline

It is important to properly prepare for this exam as it is the most intensive preliminary exam. Each individual has different study habits, so it is difficult to provide a definitive study timeline for this exam. Below is a general timeline that can be used when preparing for this exam, but please tailor it to suit your own study habits and needs.

Note: If you already have prior knowledge of the course material through taking either of the Models courses, feel free to shorten this timeline.

~ 3 months (~ 12 weeks):

- Learn the material (~ 6.5 weeks)
- Practice questions and review the material (~ 2.5 weeks)
- Practice exams and review (~ 3 weeks)

Study Tips

As mentioned above, this exam consists of a mixture of multiple-choice and written answer questions. It is important that you give yourself enough time to not only learn the material, but to

practice doing both multiple-choice and written answer questions. For the written answer questions specifically, it is important to understand what the SOA is looking for in an adequate solution. Every written-answer question that is provided for practice by the SOA is accompanied with a solution as well as remarks by the graders. It is important that you review the grader's remarks so that you become acquainted with how the SOA would like these written answer questions to be solved. Other important study tips are as follows:

- Practice, practice, practice. Make sure you spend enough time practicing both multiple-choice and written answer problems.
- If you get a question wrong while practicing, take the time to go through the solution and *understand* your mistake. It may be helpful to jot down errors that you have previously made so that you can review them and make sure you don't make the same error more than once (especially on the exam).
- Memorize the formulas. There is no formula sheet on the exam, so it is important to understand when to use each formula. The more practice you do, the easier this will be.
- Sometimes it is helpful to briefly go through the study material for a second time after you finish your first passthrough. Since there is so much content, it is common to forget some of the material presented in the first few sections.
- There are numerous TIA and old LTAM exams that can be used as practice. It is important to try to simulate the exam environment when practicing with these papers (e.g. do a 15 min read through, do not look at your notes, set the clock for 4 hours, etc.). Since this exam is very time restrictive, trying to replicate your in-exam experience can really make the exam day go a lot smoother.

Exam Day Tips

Time management is crucial when writing this exam. It is important that you spend a proportionate amount of time on multiple-choice and written answer questions. The exam consists of 20 multiple-choice questions worth 40 points and written answer questions worth 56 points (usually 5-7 questions). Thus, spending approximately 1.5 hours on multiple choice and 2.5 hours on written answer is a good guideline to follow. Other important tips for exam day are as follows:

- *Previously, you were provided a 15 minute read through. However, since LTAM has moved to prometric testing centers, this is no longer current. The 15 minute read through was scrapped; the exam starts immediately. In it's place, the exam time is extended by 15 minutes in order to provide a 'break time'. I personally treated this as 15 additional minutes of exam time*
- **Try your best to not leave any questions blank.** Even writing down a formula can earn you partial credit.
- Show your work! It is important to show the process you followed to achieve the solution. Even if your answer does not match what the question is asking for, you will earn a majority of the marks if you demonstrate to the grader that you followed the correct process to obtain the answer.
- *Additionally: If you do not get the same answer as the given result, I personally would not make it a priority to erase/cross off and redo the question. First, I would make sure I am able to get to all of the other questions first. Second, if I had time remaining, I would go*

back and review the question to find the mistake. Once you find the mistake, you can simply make a note that identifies the mistake, and explain that this caused your answer to differ from the intended solution.

- Do not spend too long on a single question. If you are stuck, move on and come back to it later.

EXAM SRM

By *Corey Haverstick*

For exam SRM I used 3 different study materials (which might have been a bit overkill). My 3 sources were: TIA and the 2 source textbooks listed by the SOA: Regression Modeling with Actuarial applications and Introduction to Statistical Learning with Applications in R. I would highly recommend using TIA for this exam; the course goes very in-depth into the material being tested which gives the user a better chance at passing this exam. Unlike many of the other preliminary exams (except for parts of IFM), this exam is heavily weighted towards the **qualitative** questions. Having a deep understanding of the material will make it easier to have success. The two SOA source textbooks are good supplementary materials and are sometimes helpful to refer to as this is where the SOA gets its information from to make the questions. Both can be found online for free which is a bonus.

I studied for about 2 months for this exam; watching TIA for the first month and then doing questions and reviewing my notes and the source textbooks for the second month. I thought this was a good strategy that allowed me to really learn and understand the material and as a result I felt quite confident when sitting. A good number of questions in the real exam listed 3 statements about a given topic and asked which of the following are true/false. The answers will then give combinations of all the statements making the questions a little tricky. That is why knowing the material in-depth will allow for these tougher questions to become easier as you can really decipher between the right and wrong statements.

ACT 4010 is the sole course available for exam SRM at the university. I did happen to take this course, but it was after I had already written exam SRM. I would say this course gives you a good background on the much less tested quantitative questions asked in the exam. So, taking the course would not hurt you, but there would still be a bunch of work to do to prepare for the exam as it has a much higher weighted qualitative aspect.

EXAM PA

By *Adrian Ferens*

Exam PA is probably one of the trickiest preliminary exams that the SOA has produced. The learning modules are quite expensive and tell you to reference material in another textbook that they want you to buy as well. However, there are solid ways to approach the exam, such that you will pass this exam on the first try.

There are three components to Exam PA: understanding the methods and theory behind predictive modelling, writing the script in RStudio to establish your model and writing a report that describes the results of the predictive model(s) you chose. The next paragraphs will outline the best way, in my opinion, to approach these sections, and prepare for the exam.

Theory

I would again like to preface this by saying the modules you purchase with the exam are impractical, at least in the early stages of learning. The best way to begin learning the theory for Exam PA, especially for those that do not need to take Exam SRM, is through the ISLR videos/textbook. The videos are completely free on YouTube and were probably my saving grace when it came to this exam; they are phenomenal, and also provide really cool RStudio tutorials. The textbook is also free, but I would prioritize watching the videos because they are really that good. The link below has the videos, the free textbook, and other resources. My recommendation is to watch the videos at least once, and make sure that you are comfortable with the material before moving on to next steps.

<http://fs2.american.edu/alberto/www/analytics/ISLRLectures.html>

RStudio

If you are very comfortable with RStudio, you can skip this section. I found that the modules that you are required to purchase with this exam did not teach RStudio very well. Learning RStudio with the modules the SOA provides is like trying to eat soup with a fork. I turned to an online course which was phenomenal and was an integral part of my learning for the exam. I have nothing but amazing things to say about the course and instructor and would HIGHLY recommend purchasing it if you do not know how to code in RStudio. They tend to have insane deals on the course too, sometimes costing as low as \$30 CAD. The link to the course is below. At the bare minimum, my recommendation is to go through all of the videos, *understand* the end of lesson examples, and *complete* the end of unit tests. These are great practice and will get you comfortable with moving quickly in the exam. If you do not want to spend the money, there are free resources such as datacamp that you can use to learn the material. Furthermore, please refer to the cheat sheet I made that contains important codes for this exam that are frequently used.

<https://www.udemy.com/course/data-science-and-machine-learning-bootcamp-with-r/>

The Report

Once you are comfortable with the theory and coding, it is now time to start the modules they provide. The foundation you developed in the previous steps will be large enough to ensure you will understand the random, sporadic nature of the provided learning modules. Read through all

the modules, and open all of the RStudio examples they provide. The way they construct their RStudio examples is by having chunks you can run to show each step of the process. My recommendation is to not actually write the chunks yourself, but rather just understand the way the code is set up, for now. In regard to the report you write, I believe the best approach is to look at the solutions for the old exams. The modules are decent in teaching you ways to write the report as well. Please refer to the cheat sheet I made (hyperlinked below in the Cheat Sheet) that has tips for addressing the report.

Preparing for the Exam

Once you have finished all of the prerequisites above, it is time to start doing practice exams. The beauty of this exam is that there is no right answer, but there is a right approach: **choose the simplest model, even if it means accuracy is sacrificed (to a degree, of course)**. Keep in mind that the end user of this model will be a business leader that does not necessarily have the predictive modelling background you would have. It is important to cater your report to this audience, and by choosing a simple model that generates results that are "good enough", your solution will be effective. Be sure to include language in your report that you chose the simpler model for this reason, however. Try out all of the exams that the SOA has archived; this is probably your greatest resource in preparing for the exam. As for recommended study time, anywhere between 4-12 weeks is sufficient. Definitely start as early as possible and reassess your position every week to see where you are at.

If I were to summarize my recommendation, it is to learn the content through ISLR videos, learn RStudio through the online course, go through the modules and their examples in RStudio, and attempt the practice exams to learn how to write the report and get a general feel for the exam. Be sure to reference the cheat sheet that is uploaded on the Survival Guide, but most of the learning should be done through the resources mentioned above.

Cheat Sheet

MEMO STEPS:

1. Who is the report for?
2. Explain the problem at hand
3. Describe the target variable
4. Describe the features
5. High level steps of alteration of features (ex, PCA - combined features)
6. Note any features that may be an ethical problem
7. Explain why we are using a GLM and what it is (high level!)
8. Note the final variables retained
9. State that the model was validated/checked
10. Explain the model output from running the GLM on the full dataset
11. Note if the changes predictions make are small, and make recommendations / how they use it is at their discretion

[Important Codes](#)

CAS EXAMS

These exams are specific to the Casualty Actuarial Society (CAS) exam path, so you should only prepare for them once you are committed to pursuing an actuarial career that requires an associate/fellow designation from the CAS (ACAS/FCAS).

EXAM MAS-1

By *Braeden Hamm*

MAS-1 is a significant step-up in terms of difficulty from IFM, both in the breadth of material covered and the complexity of the questions. It is the first CAS exam for many test-takers and requires a somewhat different approach than the prior prelims. For P, FM, and IFM, ADAPT has these exams down to a science, and there should not be too many surprises on exam day for well-prepared students. CAS exams, on the other hand, frequently pull questions from previously untested sections of the syllabus, making the “brute-force” ADAPT strategy less effective. Passing this exam therefore requires having a good understanding of the frequently tested topics, and a moderate understanding of many smaller topics that may come up. There are a few options for study materials below that do a good job of teaching in this manner.

Study Options

- Mahler Study Guide – My personal recommendation for MAS-1. Yes, it is extremely long, and the formatting is not perfect, but if you are able to get through it, you will pass as it covers all topics thoroughly. It is also very cost effective.
- Mahler Practice Exams – Extremely valuable resource even if you did not use Mahler's study guide. The questions are similar in style to the actual exam and often touch on previously untested topics.
- TIA – A good option if you like video lessons. Practice questions are on the easier side, so mixing in past/Mahler exams is recommended. Student discount available to those in university.
- ASM/ADAPT – Would not personally recommend for this exam, but I have heard of people passing that used them.
- Source Material – Reading the source material is not required to pass, but it can help in sections where the study manual explanation is not clear. I would recommend reading the covered parts of Introduction to Statistical Learning, as the text is free online and very well written.

Exam Tips

- Get a Multiview calculator and learn how to use it. The data functions are a massive time saver.
- Create a schedule and stick to it. Make sure the schedule is realistic (i.e. include days off), otherwise you will burn out before exam day. As mentioned above, this exam covers a very large amount of material, and you want to ensure you have time to get through it all.

- If you have the time, a quick first pass through the material to familiarize yourself with the topics can help. Just watching/reading and absorbing it at a high level over the course of a few weeks.
- The bulk of the time you spend studying will be grinding through the manual over the course of a few months. I recommend doing questions as you work through each section to retain the information better. The number of questions you do should be inversely proportional to how much the section made sense to you when read/watched it (i.e. if the section made sense and you got the first question or two correct, skip the rest and move on to the next part). This is very important as it will allow you to spend your time as effectively as possible and progress through the syllabus quicker.
- If you still can't wrap your head around a particular section after trying to grind through it, add it to a list and move on. It may click later or make more sense in the context of other material, and if not, you can always come back to it later once you have finished getting through the manual.
- At around 2-3 weeks before the exam, you should have completed the manual and be trying to increase your understanding of the topics you are struggling with. Practice/past exams can be a great tool for this, and you should look for patterns in the questions you get wrong to see which topics require the most focus. I wrote about 8 practice exams during this time when I was studying. Past Exam S papers can also be used if you skip the questions which are no longer on syllabus.
- Flashcards can be done in this final period as well, or as you go through the manual. There are a decent number of free marks on the exam for knowing random facts and formulas.

EXAM MAS-2

By *Keren Chheang*

In my opinion MAS-2 is a unique exam because there is a shift of focus from quantitative questions to qualitative questions. Consequently, there will be a shift in study strategy. Buying a 2-week Adapt subscription and grinding out questions like a lunatic won't work here—unfortunately, you *actually have to understand the material* to get by.

Study Options

- Source Material – I recommend using the source material as your main study reference. Going through the material several times is necessary to pass.
 - Section A: The readings for section A can be skimmed over if you have taken ACT 4030 since credibility is already covered well in the course.
 - Section B: This section makes up the second largest portion of the exam, and case study questions will be based on this material. I highly recommend going through this textbook twice and pay attention to the accompanying R examples since you will be given R output to read through as part of the case study questions.
 - Section C: This section makes up the largest portion of the exam, reading this at least **three** times should be a requirement since majority of the topics covered here cannot be tested computationally. This means that you will be given difficult theoretical questions which will only be easy to answer if you have a thorough understanding of the concepts. The CAS also includes a study note for this section from which past exam questions have been drawn from.
 - Section D: The exam typically has a few questions from this section that are straightforward so make sure to understand this for free marks. Basically, know all the concepts that's the bottom line.

- Manuals – ASM, ACTEX, and TIA all have manuals for MAS-ii but they should not be your primary source of studying. Each of these manuals have several practice problems but I don't believe that they are indicative of what the actual exam will look like.
- Past exams – There are three of these available and they are very good practice, but don't get too comfortable with questions style that appears on these exams. The CAS is known for throwing a lot of curve balls when it comes to the MAS exams so don't expect any copy pasta.

Tips

- Just read the source, you'll be surprised at how much of a better understanding you'll get through the source material compared to a manual.
- When reading the source text, I recommend the first pass through to be quick. Don't take any notes just try to get exposure to all the topics just so you can gauge what you'll have to spend more time on.
- Cue cards can be valuable for this exam since there are a lot of definitions to know
- Get familiar with Pearson's Excel spreadsheet which can be found [here](#) at the very bottom of the site. This will be available during the exam and if you are familiar with basic excel functions it is much faster than using the Multiview.
- Some of the questions on the exam deal directly with examples from the textbooks so I don't know if I got this point across yet but read the source, it is more than enough to pass.
- The textbooks for sections A and B can be found online for free on the U of M library, the reading for section D is also available on the CAS website for MAS-ii. The source text for section C is the only one you must buy but you can rent a pdf for a fairly low price. I got it on VitalSource.

EXAM 5

By *Shine Wang*

Exam 5 seems far away for university students. But it is actually the exam that is most relevant to actual P&C work. During my internship in pricing team, I was working with extension of exposure models, which is covered in the first half of the exam (rate making). My full time job is in reserving team, everything we do on the daily basis can be found in the second half of the exam (reserving). By studying these two books, students can gain better knowledge of the industry, which can also help with your interviews in the coming recruitment season.

Study Options

I personally used TIA. TIA has nice video lessons and they converted all historical exams into excel form, which is really nice to have. Other options include Bedford, battleacts, ALL10, etc.

Exam Tips

Take ACT4160! This course covers half of the material for exam 5 - the ratemaking. And it is the harder part. If you can take the 4 months to study hard on this course, everything else will come naturally.

During CAS exams you have access to spreadsheets (no excel shortcuts tho!). So get yourself used to spreadsheet calculation while doing exercise (no more calculators!)

Starting from this exam, it is no longer MC. Be prepared for short paragraph answers. One widely accepted rule is one sentence (or one point if the question asks you to list out things) per 0.25 point. This also applies to ACT4160!

If you had enough time in your previous MC exams. This one will be different. It is 24 written answer questions (some may have 3 or 4 parts) in 4 hours - 10 mins per question. Time yourself well.

ADVANCED SOA/CAS EXAMS

FSA TRACKS

By Devin Kinley



Figure 1.6 The path to FSA

Recall this big scary graph. Now let's look at the big scary part of the big scary graph.

These descriptions reflect my general understanding of the tracks based on research and speaking with dozens of actuaries about their opinions on the different options.

It is important to note here that the track you decide to follow will not limit your career options in any way. Students sometime believe, for instance, that those following the Investments track will have to work in investments for the rest of their career. This is far from the truth. Because of this, it is often recommended that you choose a track that interests you, so to make studying for the exams as enjoyable as possible.

INDIVIDUAL LIFE AND ANNUITIES

The Life and Annuities track is the most traditional actuarial path. These exams deal with the design, pricing, and reserving of individual life and annuity products. This path is considered one the easier tracks and is the preferred track for those working at life insurance companies. If you enjoyed exam MLC, this track might be for you.

QUANTITATIVE FINANCE AND INVESTMENTS

The QFI track is notoriously difficult. This track deals with investments, hedging strategies, and variable annuity products. Great for those who hate memorizing and are interested in the world of investments. If you enjoyed exam MFE, this track might be for you.

CORPORATE FINANCE AND ENTERPRISE RISK MANAGEMENT

The ERM track will allow you to gain a thorough understanding of risk evaluation and strategic decision-making areas. It is meant to be applicable across all industries, making it an appealing option for those looking to eventually work outside of the actuarial world.

GENERAL INSURANCE

The General Insurance track is the FSA equivalent of the FCAS as it prepares you for the world of Property & Casualty. Currently, the general consensus is that students interested in working in the world of P&C in North America should consider the FCAS designation over FSA-General Insurance. This is evidenced by the fact that as of now there is currently only 15 FSA's in the world who pursued this track. Perhaps this track will improve in coming years, but for now, stay away.

GROUP AND HEALTH

This track will prepare you for the world of group insurance. A wise move if you plan to start your career in group insurance, and if you have lots of room in your brain because you have to be ready for loads of memorization.

RETIREMENT BENEFITS

Generally, the track of choice for those working in pension consulting as it will prepare you for working with pensions, their design and ensuring their proper reporting. If you choose this route and work is the US, you may also want to consider pursuing the Enrolled Actuary (EA) designation.

BONUS: CERA DESIGNATION

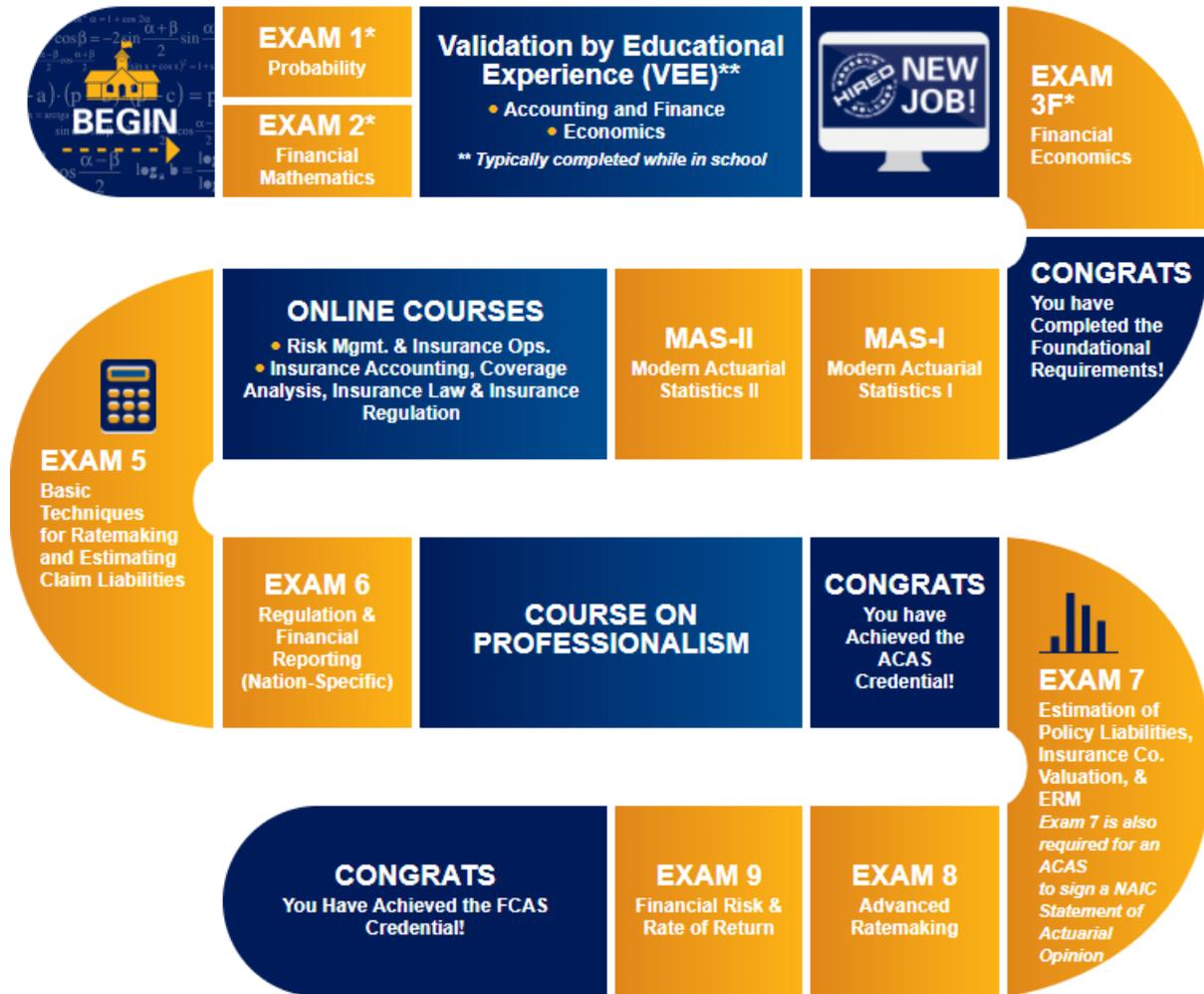
From soa.org

The CERA designation was introduced in 2007 to meet current and future market changes on critical Enterprise Risk Management (ERM) including actuarial approaches to risk. This designation is one you can attain while achieving your FSA with a small addition of 2 exam hours to help improve your opportunities and further your risk management knowledge.

FCAS TRACKS

By Devin Kinley

There is only one CAS track that every CAS actuary takes to become an FCAS. Below is a graph from the CAS website on the path to becoming an FCAS.



It's as simple as that – no more decision for you if you've chosen the FCAS route!

OVERALL TIPS AND ADVICE

By *Lynette Rutbeek*

1. Don't be afraid to take breaks during the exam progress when needed
2. Always seek advice from students who have previously taken the exam. These exams can feel very daunting at times, and having the support of someone who understands how grueling they are helps so much!
3. Tailor your studying to your learning type. If you learn best from listening to lectures, perhaps video lessons and taking the courses first would be your preferred method of studying. However if you are a visual learner and feel as though you gain very little from attending university classes; then grinding through manuals, even before taking the class, may be a suitable approach.
4. Make sure your study schedule is not overly ambitious. If you do not schedule breaks, and time to engage in social activities – not only will you be burnt out in a couple months, but in the long run; you will regret absolutely slaving over these exams when you could have benefited greatly from a more balanced approach

