SOCIETY OF ACTUARIES

Basic Education Catalog

SPRING 2005

SOCIETY OF ACTUARIES

MISCELLANEOUS INFORMATION

- All applications and order forms can be found in the back of the printed catalog or on the SOA Web site, www.soa.org. For hard copies of the catalog send requests to inforequest@soa.org.
- Please refer to our web site for any future updates to course information.

The following is a list of abbreviations that will be found in this catalog:

AAA	American Academy of Actuaries
APC	Associateship Professionalism Course
ASA	Associate of the Society of Actuaries
ASB	Actuarial Standards Board
ASP	Actuarial Standards of Practice
ASPA	American Society of Pension Actuaries
BOG	Board of Governors—Society of Actuaries
CAS	Casualty Actuarial Society
CCA	Conference of Consulting Actuaries
CIA	Canadian Institute of Actuaries
CLU	Chartered Life Underwriter
CMA	Chartered Management Accountant
CPCU	Chartered Property/Casualty Underwriter
EA	Enrolled Actuary
EA-1	Enrolled Actuaries Basic Examination
EA-2, A	Enrolled Actuaries Pension Examination, Segment A
EA-2, B	Enrolled Actuaries Pension Examination, Segment B
E&E	Education and Examination
FAC	Fellowship Admissions Course
FAS	Financial Accounting Standard
FASB	Financial Accounting Standards Board
FSA	Fellow of the Society of Actuaries
ISN	Introductory Study Note
JBEA	Joint Board for the Enrollment of Actuaries
NAAJ	*North American Actuarial Journal*
PD	Professional Development
PE	Preliminary Education
RSA	*Record, Society of Actuaries*
SN	Study Note
SOA	Society of Actuaries
TSA	*Transactions, Society of Actuaries*
TSA Reports	*Transactions, Reports of Mortality and Morbidity Experience, Society of Actuaries*
VEE	Validation by Educational Experience

THE SOCIETY OF ACTUARIES

Mission and Vision Statement of the Society of Actuaries

The Society of Actuaries (SOA) is an educational, research, and professional organization dedicated to serving the public and Society members. Its mission is to advance actuarial knowledge and to enhance the ability of actuaries to provide expert advice and relevant solutions for financial, business, and societal problems involving uncertain future events. The vision of the SOA is for actuaries to be recognized as the leading professionals in the modeling and management of financial risk and contingent events.

Terms and concepts used in the Mission and Vision Statement may be amplified as follows:

1. **Education Organization**

   The SOA provides basic education in the fundamental principles of actuarial science, advanced education and professional development in areas requiring specific technical or regulatory knowledge, and continuing education for practicing actuaries.

2. **Research Organization**

   The SOA conducts research to develop studies of historical experience and techniques for projections into the future, to analyze the actuarial aspects of public policy issues, and to provide the foundation for further expansion of the profession.

3. **Professional Organization**

   The SOA promotes high standards of professional competence and conduct within the actuarial profession. The SOA has adopted a Code of Professional Conduct, and in matters of conduct and discipline, it cooperates with the Canadian Institute of Actuaries and with the American Academy of Actuaries, including the Actuarial Standards Board and the Actuarial Board for Counseling and Discipline.

4. **Serving the Public**

   By developing and valuing financial programs, actuaries provide service to the public. In addition to looking after the interests of direct participants and beneficiaries of such public and private programs, actuaries also provide advice to shareholders, regulators, financial analysts and others. The SOA meets its responsibility to the various publics by recruiting and educating actuaries and by its role as a professional organization. Note that the SOA places serving the public ahead of serving its members.

5. **Serving its Members**

   The SOA is committed to meeting the needs of its members. Members work in the traditional practice areas of life insurance, retirement systems, health benefit systems, financial and investment management, and in emerging practice areas. In meeting the needs of its members, the SOA conducts meetings and seminars, publishes papers and studies, makes or sponsors investigations, promotes educational activities for candidates and members, utilizes technology to enhance communications, sponsors academics and supports universities with actuarial science programs, organizes special interest sections, and undertakes such other activities as appropriate. However, in accomplishing many of these tasks, the SOA relies on the generous support of its members in volunteer roles.

   Although the majority of the SOA members reside in Canada or in the U.S., a significant number of members live or practice in other geographical areas. The SOA is committed to encouraging the development of actuarial science worldwide and to addressing the international needs of SOA members. The SOA is a member of the International Actuarial Association and of the worldwide actuarial profession.

6. **Advancing Actuarial Knowledge and Enhancing the Ability of Actuaries**

   Knowledge of actuarial science is the foundation of the actuarial profession. Actuaries often deal with problems relating to uncertain future events. With insurance based on scientific actuarial principles, financial aspects of uncertainties such as premature death, disability, need for medical care, etc., can be exchanged for the certainty of a premium payment. Pension and social security programs require actuarial analysis based on contingencies such as period of employment, covered earnings, and mortality. Investments and other financial transactions involving risk or uncertainty

can also be modeled using actuarial techniques. In a dynamic and rapidly changing world, actuarial knowledge must be continuously expanded to meet increasingly complex problems and to enhance the value added by actuarial analysis.

7. Recognition as the Leading Professionals

The vision of the SOA is not only to have actuaries be the leading professionals in the modeling and management of financial risk and contingent events, but to have this expertise widely recognized and accepted outside the actuarial profession as well.

8. Critical Success Factors

Critical success factors for the profession and the SOA are:

For the Profession

- Be relevant to the needs of our customers. Provide value to a constituency sufficiently large to sustain meaningful work for current and future members of the profession. This may mean expanding our horizons as a profession.
- Be recognized and credible with employers, clients, policymakers and the public by clearly defining who we are and how we differ from others.
- Expand the scope of the actuarial profession. Design a paradigm that expands the scope of meaningful applications of our science, while preserving its integrity and uniqueness.
- Have an effective influence on public policy.
- Focus on maintaining quality membership by recruiting, educating and retaining people who are a credit to the profession, the customers and the societies we serve.
- Be forward looking, flexible and adaptable. Where appropriate, motivate the need for actuarial services in the absence of government regulations. Focus our professional resources on outcomes most important to members and the public.

For the SOA

- Provide a relevant educational system to train new actuaries and provide continuing education for actuaries. Keep Education and Examination (E&E) and Continuing Education systems in line with the profession's needs.
- Carry out research initiatives that maintain a current knowledge base and expand it so that we can add value to our customers; publications should support dissemination of the knowledge base; knowledge base needs to support both new and existing practice areas.
- Provide appropriate scope for actuarial practice, encompassing attention to the new practice areas and appropriate geographical areas, and building and maintaining employment opportunities for actuaries. Focus should continue to be on customer needs.
- Provide and maintain strong and effective services for members. The key is helping members add value to their customers with emphasis on external focus.
- Maintain a strong volunteer system and effectively support it with staff.
- Provide support to help achieve the critical success factors for the profession.
- Prepare for the future, focusing on both the long and the short term.

  The critical success factors should serve as a framework for testing priorities and allocating resources.

Principles Underlying the Education and Examination (E&E) System

The SOA administers a series of courses leading to Associateship and Fellowship. The principles underlying the SOA E&E system are the following:

1. To provide the actuary with an understanding of fundamental mathematical concepts and how they are applied, with recognition of the dynamic nature of these fundamental concepts in that the actuary must remain up-to-date with developments in mathematics and statistics;
2. To provide the actuary with an accurate picture of the sociodemographic, political, legal, and economic environments within which financial arrangements operate, along with an understanding of the changing nature and potential future directions of these environments;
3. To expose the actuary to a broad range of techniques that the actuary can recognize and identify as to their application and as to their inherent limitations, with appropriate new techniques introduced into this range as they are developed;

4. To expose the actuary to a broad range of relevant actuarial practice, including current and potential application of mathematical concepts and techniques to the various and specialized areas of actuarial practice; and
5. To develop the actuary's sense of inquisitiveness so as to encourage exploration into areas where traditional methods and practice do not appear to work effectively.

Admission Requirements to the SOA

Associateship

A. Who may be admitted

Anyone pursuing actuarial studies may apply for admission to the SOA. If the Board of Governors (BOG) approves the Application for Admission as Associate, the candidate will be enrolled as an Associate of the Society of Actuaries (ASA) after completing the Associateship educational requirements as prescribed by the BOG, subject to any further requirements that the BOG may prescribe. Membership dues are not charged until the Application is accepted and all requirements prescribed by the BOG have been satisfied.

B. When and how to apply

A candidate planning to seek admission to the SOA should submit the Application for Admission as Associate before completing the educational requirements for Associateship. The Application for Admission as Associate is separate from the candidate's course registration application and will be sent to candidates who have passed the SOA Preliminary Education examinations. Upon receiving the Application for Admission as Associate, candidates are encouraged to complete the application and return it to the Membership Coordinator at their earliest convenience. Any questions regarding the application should be directed to the Membership Coordinator at 847-706-3532.

C. Associateship Requirements

To attain Associateship, the candidate must successfully complete the course requirements described below, and must have the Application for Admission as an Associate approved by the SOA Board of Governors.

Credit for all courses must be obtained by examinations offered by the SOA or by alternative methods approved by the BOG. In certain circumstances, course credit may be obtained by waiver for a candidate who has the examination credits in another actuarial organization.

Effective January 1, 2005 the following requirements for Associateship will be applicable.

1. All candidates must complete Exams P, FM, M and C, collectively known as the preliminary education component (Credit earned from a passing score on Courses 1–4 administered in the Fall 2004 will be converted appropriately).
2. Satisfy Validation by Educational Experience (VEE) for three subjects: economics, corporate finance and applied statistics. (VEE credit earned from a passing score on Courses 2 and/or 4 administered in the Fall 2004 will be converted appropriately).
3. Candidates may elect any two of the following, subject to stated restrictions:
   - Course 5
   - Course 6
   - Course 7
   - Course 8 (select one Course 8 examination)
   - Professional Development (PD) component
4. All candidates must also complete the Associateship Professionalism Course (APC). Candidates must also have an approved Application for Admission as an Associate on file, as described above.

Course selections from, among Courses 5, 6, 7, 8 and PD are subject to the following restrictions:

1. Candidates may not use the combination of Course 7 and PD unless Course 7 credit was obtained through conversion to the 2000 system.
2. A candidate who elects to use Course 7 must satisfy all of the prerequisites for Course 7 and complete all eligibility qualifications for the Course 7 Prerequisite Waiver as stated in the Course of Reading and Description of Examinations.
3. Candidates may not use two Course 8 examinations towards the ASA examination requirements.

4. If a candidate elects to use PD, the candidate must satisfy all of the requirements of the PD component. In addition, the following criteria apply when PD is used as one of the additional components for the ASA:
   - No plan can be filed until the candidate has received a passing score for all of the preliminary education exams; satisfied VEE requirements and obtained a passing score for one additional component (Courses 5, 6, or 8).
   - A minimum of 25 units of the total 50 required PD units of credit must be obtained with a passing score from an examination-validated program.
   - Candidate may use unassigned conversion credits from the pre-2000 SOA education system to satisfy the requirement for 25 units of examination-validated credits.
   - A candidate who uses the PD component towards the ASA requirements and who continues to Fellowship must submit a second PD plan to meet the requirements for Fellowship.

Fellowship

A. Who may be admitted

An Associate will be admitted as a Fellow of the Society of Actuaries (FSA) after completing the Fellowship educational requirements, including the Professional Development (PD) requirement, the Fellowship Admissions Course (FAC), and any additional requirements prescribed by the BOG. No application is required for an Associate to be admitted as a Fellow.

B. Fellowship Requirements

Associates must complete all remaining educational requirements including the PD Requirement. The FAC is required of all candidates for Fellowship, and candidates may not attend the FAC until they have completed the Preliminary Education examinations and Courses 5-8 and the PD requirement.

Education Redesign

The current education system is undergoing revision. The first phase of this Education Redesign covers the Preliminary Education Component and will be in effect during the period covered by this catalog. Information related to Validation by Education Experience (VEE), Exams P, FM, M and C, and the Conversion Rules can be found in the appropriate sections of this catalog.

Other components of the redesign, however, will not affect the syllabus in effect for the period covered by this current catalog. Please watch the SOA Web site for announcements on implementation plans and other updates to the Education Redesign components. You may also contact EQ2005@soa.org for general questions or VEE@soa.org for VEE related questions.

COURSE LISTINGS

Note that the Preliminary Actuarial Exams now consist of Probability (P), Financial Mathematics (FM), Actuarial Models (M) and Construction and Evaluation of Actuarial Models (C).

Specific Associateship and Fellowship requirements can be found under Current Admission Requirements to the SOA.

Course/Exam	**Title**	**Offered**
P*	Probability	Spring & Fall
FM*	Financial Mathematics	Spring & Fall
M	Actuarial Models	Spring & Fall
C*	Construction and Evaluation of Actuarial Models	Spring & Fall
5	Application of Basic Actuarial Principles	Fall
6	Finance and Investments	Spring
7	Applied Actuarial Modeling	Various
8	Advanced Specialized Actuarial Practice Candidates must choose one of the following: Finance and Enterprise Risk Management** Health, Group Life & Managed Care*** Individual Insurance (U.S. and Canada) Investments Retirement Benefits (U.S. and Canada)	Fall
Professional Development Requirement, Associate and Fellowship		
Associateship Professionalism Course (APC)		Various
Fellowship Admissions Course (FAC)		Various
Other Offerings		
Course	**Title**	**Offered**
EA-1	Enrolled Actuaries Basic Examination	Spring
EA-2, A	Enrolled Actuaries Pension Examination, Segment A	Fall
EA-2, B	Enrolled Actuaries Pension Examination, Segment B	Spring

*Courses P, FM and C are identical to the Casualty Actuarial Society (CAS) exams 1, 2 and 4 respectively.

**Candidates selecting the Course 8 Finance and Enterprise Risk Management examination will also select a subspecialty of either Finance or Enterprise Risk Management.

***Candidates selecting the Course 8 Health, Group Life and Managed Care examination will also select a subspecialty of either Managed Care or Health and Group Life.

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GENERAL INFORMATION REGARDING EDUCATION AND EXAMINATIONS

Spring 2005 Examination Dates and Times

Course/Exam	Duration	Date	Time
P*: Probability	**3 hours	Wednesday, May 25	8:30 AM–11:30 AM
FM*: Financial Mathematics	**2hours	Thursday, May 26	8:30 AM–10:30 AM
M: Actuarial Models	4 hours	Thursday, May 19	8:30 AM–12:30 PM
C*: Construction and Evaluation of Actuarial Models	4 hours	Wednesday, May 18	8:30 AM–12:30 PM
6	5 hours 25 min.	Friday, May 13	8:30 AM–11:45 AM and 1:30 PM–3:40 PM
EA-1	2 hours 30 min	Tuesday, May 17	8:30 AM–11:00 AM
EA-2, Segment B	2 hours 30 min	Tuesday, May 17	1:00PM–3:30PM

*Exams P, FM and C are identical to the CAS Exams 1, 2 and 4 respectively.

** There may be changes in the time allotments of Exams P and FM. However, starting times should be consistent with this schedule. You will be notified as soon as any changes in the schedule are finalized.

Note: *Course 6 includes a read-through time. See the individual course description for details.*

Tentative Fall 2005 Examination Dates and Times

Course/Exam	Duration	Date	Time
Exam P: Probability*	**3-4 hours	September	TBD
Exam FM: Financial Mathematics*	** 2 hours	Wednesday, November 9	8:30 AM–10:30 AM
Exam M: Actuarial Models	4 hours	Tuesday, November 8	8:30 AM–12:30 PM
Exam C: Construction and Evaluation of Actuarial Models*	4 hours	Monday, November 7	8:30 AM–12:30 PM
Course 5	5 hours 25 min.	Wednesday, November 2	8:30 AM–11:45 AM and 1:30 PM–3:40 PM
Course 8 (8F) Finance & Enterprise Risk Management – Finance extension	6½ hours	Thursday, November 3	8:30 AM–11:45 AM and 1:30 PM–4:45 PM
Course 8 (8E) Finance & Enterprise Risk Management – Enterprise Risk Management Extension	6½ hours	Thursday, November 3	8:30 AM–11:45 AM and 1:30 PM–4:45 PM
Course 8 (8G) Health, Group Life and Managed Care—Health and Group Life Extension	6½ hours	Thursday, November 3	8:30 AM–11:45 AM and 1:30 PM–4:45 PM
Course 8 (8M) Health, Group Life and Managed Care—Managed Care Extension	6½ hours	Thursday, November 3	8:30 AM–11:45 AM and 1:30 PM–4:45 PM
Course 8 (8IU & 8IC) Individual Insurance - U.S. and Canada	6½ hours	Thursday, November 3	8:30 AM–11:45 AM and 1:30 PM–4:45 PM
Course 8 (8V) Investments	6½ hours	Thursday, November 3	8:30 AM–11:45 AM and 1:30 PM–4:45 PM
Course 8 (8RU & 8RC) Retirement Benefits U.S. and Canada— Comprehensive Segment	4 hours 55 min.	Thursday, November 3	8:30 AM–11:45 AM and 1:30 PM–3:10 PM
Course 8 (8P) Retirement Benefits— Pension Funding Mathematics	1 hour 40 min.	Friday, November 4	2:00 PM–3:40 PM
EA-2, Segment A	4 hours	Friday, November 4	8:30 AM–12:30 PM

* Exams P, FM and C are identical to the CAS Exams 1, 2 and 4 respectively.

**There may be changes in the time allotments for Exams P and FM. However, starting times should be consistent with this schedule. You will be notified as soon as any changes are finalized.

Note: *Courses 5 and 8 include read through times. See individual course descriptions for details.*

Computer Based Testing for Exam P

In spring 2005, Exam P will be offered in the traditional pencil-and-paper format. In September, 2005 Exam P will be offered as a computer-based test. Details will be posted in the Education and Jobs section of the SOA Web site (www.soa.org). There will not be a Fall 2005 administration for Exam P as Exam P will be offered by computer-based testing in early 2006. Starting in 2006, Exam P will be offered more than twice a year.

Course 7

Course 7 Applied Actuarial Modeling requires passing a pre-test and successfully completing a separate seminar. Pre-tests are administered on the first Friday of the following months: February, April, June, August, October and December. Course 7 seminars are scheduled as follows:

2005 Course 7 Seminars

Location	2005 Dates	Specialty	Number of Seminars
Atlanta	February 28-March 3	General	3
Montreal	March 14-17	Pension	1
Montreal	March 14-17	General (French)	1
Chicago	June 6-9	General	3
Hong Kong	July 11-14	General	2
Seattle	July 11-14	General	3
Boston	August 15-18	Pension	1
Boston	August 15-18	General	2
Chicago	December 5-8	General	3

All seminar schedule changes (whether location, date or specialty) will be made on the seminar application form found on the Course 7 page of the SOA Web site at http://www.soa.org/ccm/content/?categoryID=825036.

Course 7 pre-test applicants may cancel pre-test registration in writing no less than two weeks prior to the administration of the pre-test. The SOA will refund the registration fee, minus a cancellation fee of $60 (U.S.). No refunds will be considered for Course 7 pre-test applicants who fail to send a written cancellation request and simply do not write the pre-test. A written request to change pre-test registration to an alternate pre-test date will be accommodated when received no less than two weeks prior to the administration of the registered pre-test.

A candidate who submits an application for a Course 7 Seminar, but is unable to attend that seminar may submit a written request for a refund. The SOA will refund the registration fee, minus a cancellation fee of $200 (U.S.). A written request to change Course 7 registration to an alternate date or location will be accommodated when possible and a fee of $100 (U.S.) will be assessed if cancellation is received prior to the registration deadline. After the deadline, the transfer fee will be $200 (U.S.).

Candidates awaiting pre-test results who have submitted a seminar application and who are subsequently unsuccessful on the pre-test will have their seminar registration canceled and registration fee refunded, less a $100 (U.S.) processing fee. These candidates will not be permitted to register for another seminar until they have registered for another pre-test.

The SOA has the right to cancel or reschedule any of the Course 7 seminars if conditions warrant. In the event of a cancellation, full registration fees will be refunded. Candidates registered for a seminar that must be rescheduled may attend on the rescheduled date, choose another available seminar date or apply for a refund without penalty. The SOA will not be held liable for any airline or other cancellation fees assessed attendees in the event of a canceled or rescheduled seminar.

Applications to Write Examinations and Deadlines for Submittal

Applications for all SOA examinations are available in this catalog or may be obtained from the SOA web page (www.soa.org), or e-mail inforequest@soa.org or fax 847-273-8526. For the Enrolled Actuaries examinations, applications are also available from the American Society of Pension Actuaries (ASPA). Applications for the Casualty Actuarial Society (CAS) examinations are available from the CAS in the 'Students' Corner' of the CAS Web site (www.casact.org).

A candidate may not write an examination for a course for which the candidate already has credit.

Applications must be received on or before April 1 for the Spring session, and on or before September 24 for the Fall session. Applications received after the deadline will not be considered.

A registered candidate who requests a change of examination center must pay a $60 (U.S.) change-of-center fee. *No change of center may be made after April 1 for the Spring examinations, or after September 24 for the Fall examinations.*

The registration deadline for the Course 7 pre-test is no later than two weeks prior to the administration of the pre-test (administered on the first Friday of the following months: February, April, June, August, October and December). Applications for a Course 7 seminar must be received no later than four weeks prior to the starting date of the seminar. However, please note that Course 7 seminars do have limited seating and may fill to capacity prior to registration deadlines.

Candidates will not be considered registered for an examination until the SOA has received an original, signed application for the examination session. Unsigned, photocopied or facsimile applications are not valid. **All applications must include an original signature of the candidate.**

Course Fees

Fees listed in this Catalog are guaranteed through the Spring 2005 examination session only. Candidates will be notified of any changes in fees. The examination fees for the Preliminary Education examinations and Course 6 include electronic access to the required study notes.

Course Fees for Spring 2005

Course/Exam	Fee*
P**	$ 100.00
FM**	$ 150.00
M	$ 375.00
M Student Fee	$ 300.00
C**	$ 375.00
C Student Fee**	$ 300.00
VEE*** (Validation by Educational Experience) per topic	$ 50.00
6	$ 725.00
7 Pre-test	$ 150.00
7 Seminar	$ 1000.00
EA-1	$ 200.00
EA-2, Segment B	$ 200.00
Professional Development (Filing Fee)	$ 150.00

* All amounts in U.S. dollars
** Exams P, FM and C are identical to the CAS Exams 1, 2 and 4 respectively.
*** If applying for two VEE topics simultaneously, the application fee will be $75.
If applying for three VEE topics simultaneously, the application fee will be $100.

Student fees are available only to candidates currently enrolled in full-time university study programs.

Reduced examination fees are available to qualified candidates in eligible countries. Please see the SOA Web site at http://www.soa.org/ccm/content/exams-education-jobs/candidate-and-exam-information/examination - or contact Leslie Fausher, Core Studies and Global Initiatives Administrator lfausher@soa.org.

Fees should be remitted in U.S. funds (or equivalent) by check, money order, American Express, MasterCard or Visa. Please note that payment in non-U.S. currency may slightly delay the processing of the application.

Refunds

A candidate who submits an application for an examination but does not write that examination may submit a written request for an examination refund. **A $60 (U.S.) administrative fee is assessed on all refunds.** The written request must be received at the SOA no later than June 30, 2005 for the Spring examinations. Requests will not be considered after this date. *Change-of-center fees and fees for writing at specially arranged centers will not be refunded.* ***Fees cannot be transferred from one session to another.*** Special policies apply to the Course 7 pre-test and seminar. Please see the **Course 7** section for additional details.

Examination Locations

Regular examination centers are set up in many locations, with consideration given to the number of candidates in the vicinity and the availability of appropriate facilities and supervisory personnel. Special examination centers may be arranged at the discretion of the SOA office. The additional fee for these special centers is $60 (U.S.); *requests must be received by the **Aprll 1 registration deadline** for the Spring examinations*.

Examination centers are listed on the SOA Web site. A candidate's examination center will be indicated on the Ticket of Admission.

Please check our web site: www.soa.org periodically for updated center information. Center locations are subject to change prior to the exam date.

Special Arrangements for Candidates with Disabilities

A candidate with a formally diagnosed disability who needs special testing arrangements must submit a written request to the SOA office for each session the candidate intends to write. Documentation of the disability (e.g., physician's statement, diagnostic test results) as well as the need for special arrangements are required of each candidate; previous accommodations given to the candidate in an educational program or work setting are also considered. *Requests for special arrangements and supporting documentation must be submitted, at the applicant's expense, **no later than April 1** for the Spring examinations*.

Food and Beverage in Examination Room

Candidates will be permitted to bring bottled water into the examination room. No food or other beverage, except as required for medical situations and with preauthorization provided, will be permitted. Candidates requiring special accommodations must submit a written request with their application. Written requests should be directed to the Examination Services Department c/o Society of Actuaries.

Ticket of Admission/Instructions to Candidates

The SOA office will mail each candidate: 1) a *Ticket of Admission,* which indicates the examination(s) for which the candidate is registered, and 2) the *Instructions to Candidates,* which covers administrative details about the examination, and 3) the *Examination Center Locations* which lists the exact address of each exam center. ***This Ticket of Admission must be brought to the examination center***. Tickets of Admission will be mailed beginning March 1 for the Spring session and September 1 for the Fall session. The ticket indicates the examination center to which the candidate should report and also provides the candidate number. This candidate number is to be written by the candidate on the examination(s) for identification purposes. **Candidates are strongly encouraged to retain their candidate numbers after the examination session is completed**. A candidate number is required to access pass/fail information through the SOA **automated hotline**.

*A candidate who has not received a Ticket of Admission two weeks prior to the examination, or whose ticket contains incorrect information, should call the SOA Examination Services Department at **847-706-3583**.*

The Ticket of Admission also serves as a receipt and should be retained if needed for tax purposes.

Requirements for Admission to Examination Center

To be admitted into an examination center, each candidate must present a valid Ticket of Admission as well as positive identification with a signature and a photograph (e.g., driver's license, passport, school or work I.D., etc.). If a photo I.D. is not available, the candidate must present *two* forms of identification with a signature, with at least one form containing a physical description (height, weight, hair color, eye color, etc.). Each candidate will be required to sign in at the examination center. A candidate who does not present positive identification or who refuses or is unable to provide a matching signature will not be permitted to write the examination.

Signatures on Examination Answer Sheets and Envelopes

Candidates are **required** to sign their answer sheets and envelopes. Candidates submitting examinations without a signed statement on the multiple-choice answer sheet or written-answer envelope will not receive a grade for those examinations. The statement to be signed reads:

> **"I have neither given nor received assistance of any kind on this examination. I understand the examination is confidential and will not disclose its contents.**
>
> **This examination is being written with the understanding that if the answer sheet/envelope is returned unsigned, it will not be graded."**

Envelopes for written-answer examinations will be opened in the SOA office. Committee officers and graders will receive information identifying candidates only by candidate number.

Bilingual Examinations in Canada

For examination centers in Canada, examination booklets for the Preliminary Education examinations, 6, and 8 are printed in both English and French. For bilingual examinations, responses to written-answer questions may be in either English or French. The Course 7 seminar project may also be written in either English or French. French speaking candidates writing the Course 7 Pre-test may bring a French/English dictionary into the examination room.

Use of Calculators and Other Assistance in Writing Examinations

Only the calculators described in the following paragraphs may be brought into the examination room. Books, papers, computers or other electronic devices may not be brought into the examination room.

For the 2005 examination administrations, candidates may use the battery- or solar-powered Texas Instruments BA-35 model calculator (the official SOA/CAS calculator), the BA II Plus*, the BA II Plus Professional*, the TI-30X or TI-30Xa (the official CAS calculator) or TI-30X II* (IIS solar or IIB battery). Candidates using any of these calculators need not have calculators with the SOA or CAS logo; candidates may also continue to use any previous calculator model that bears either logo. Candidates may use more than one of the approved calculators during an examination.

The same calculator models are approved for use on the joint SOA/CAS examinations as well as the SOA examinations. For the Enrolled Actuaries (EA) examinations, candidates may use any model that meets the specifications of the Joint Board for the Enrollment of Actuaries. Specifications are listed in the Joint Board's *Examination Program*. Candidates writing these examinations will receive a special set of calculator rules with their tickets of admission. All of the approved SOA models meet the specifications of the Joint Board.

Calculator instructions cannot be brought into the examination room. During the examination, the calculator must be removed from its carrying case so the supervisor can confirm it is an approved model. Candidates using a calculator other than the approved models will have their examination disqualified.

Calculators are no longer available for purchase through the SOA. Candidates can purchase calculators from some of the book distributors listed in the back of this catalog or from Texas Instruments at http://epsstore.ti.com.

* ***The memory of TI-30X II (IIS solar or IIB battery), BA II Plus and BA II Plus Professional will need to be cleared by the examination supervisor upon the candidates' entrance to the examination room. For the BA II Plus and BA II Plus Professional, clearing will reset the calculator to the factory default settings.***

Examination Results

Candidates receive individual statements of their examination results, usually eight to ten weeks after the examination date. A few weeks later, a list of the names of passing candidates for the examination session is made available through the SOA web page (www.soa.org).

Grades are reported on a 0 to 10 scale. Passing grades range from 6 to 10; failing grades range from 0 to 5. On this scale, the interval is 10 percent of the score required to pass; for example, a grade of 5 means failing with a score of at least 90 percent but less than 100 percent of the score required to

pass. A grade of 0 does not mean that the candidate received no points, but that the candidate's score was less than 50 percent of the score required to pass.

Upon request, a copy of the candidate's answer sheet for EA-1 or EA-2 is available from the Joint Board for the Enrollment of Actuaries. Examination answer sheets are not returned to candidates for any other SOA examination. For certain examinations, an analysis of results is automatically sent to failing candidates.

An automated hotline service begins once grades have been mailed. A candidate may call the hotline at 847-706-3579. This automated hotline is an Interactive Voice Response (IVR) system that, with the use of the confidential candidate number and touch-tone phone, allows access to examination results, 24 hours a day, 7 days a week. This IVR system is designed only to give pass/fail results; no other information will be available. The hotline operates for a limited time each examination session after grades are mailed. Once examination results are released candidates are also able to access lists of passing candidate numbers via the SOA Web site.

Note: To preserve candidate confidentiality, in the event of a lost or misplaced candidate number, phone and facsimile requests to obtain the candidate number will not be honored by the SOA.

Lost Examinations

If a completed examination answer sheet or the written answers for an examination are inadvertently lost or destroyed, the examination fee will be refunded. The SOA and any jointly administering or sponsoring organizations assume no other obligation, and candidates must take all examinations subject to this understanding. The one exception to this policy is noted in the following paragraph.

In the case of a multiple-choice examination, whenever reasonably possible, the SOA will make use of a candidate's examination book to reconstruct the answers selected by the candidate. Where a candidate has clearly indicated the response selected for each question, the E&E Steering and Coordinating Committee can determine when the candidate demonstrates a passing performance and give that candidate a passing grade. Therefore, candidates may want to circle or otherwise clearly indicate their answer choices in the examination books. However, additional time in the examination period will not be given for candidates to do this. If a candidate receives a passing grade as a result of the review of the examination book, the examination fee will not be refunded.

Defective Questions

Occasionally, through an inadvertent error or a difference in interpretation, an examination question is found to be defective. Examples of defects might include typographical errors, ambiguities, or questions that test material no longer covered in the Course of Reading. Candidates who believe that a question is defective should write to the Ombudsperson at the SOA within two weeks of the date the examination was administered. This letter should explain in detail why the question seems to be defective. The SOA E&E Committee will investigate all questions brought to its attention in this way, and may make allowances in the grading process, if appropriate. The E&E Committee may make use of candidates' examination books to determine whether their scores should be adjusted. The committee makes no guarantee it can consider correspondence which does not reach the SOA office within two weeks after the examination administration.

Confidentiality of Examination Records

The fact that a candidate has passed an examination for credit with the SOA is considered public knowledge. Any further information about the examinations taken or grades received by a candidate is available only to that candidate and to E&E Committee Officers as required for Committee purposes. However, a candidate may request in writing to the SOA office that a designated person or institution should receive such information.

Disciplinary Action

Candidates must not give or receive assistance of any kind during the examination. Any cheating, any attempt to cheat, assisting others to cheat, or participating therein, or engaging in such improper conduct as listed below is a serious violation and will generally result in the SOA disqualifying the candidate's paper, and such other disciplinary action as may be deemed appropriate. Candidates have

agreed in their applications for examination to be bound by the rules and regulations governing the examinations.

Examples of improper conduct:

1. Gaining access to examination questions before the examination
2. Using an unauthorized calculator or other mechanical aid that is not permitted
3. Looking in the examination book before the instruction to begin is given
4. Marking or otherwise writing on the examination book or answer sheet before the instruction to begin is given
5. Making any changes, additions, deletions, or otherwise marking, erasing or writing on the examination book or answer sheet after the time for the examination has expired
6. Having access to or consulting notes or books during the examination
7. Looking at or copying from another candidate's paper
8. Enabling another candidate to copy from one's paper
9. Talking or otherwise communicating with another candidate during the examination.
10. Disturbing other candidates during the examination
11. Consulting other persons outside the examination room during the examination
12. Copying questions, answers, or answer choices onto paper or into a calculator to take from the examination room
13. Taking an examination book from the examination room
14. Taking an examination for another candidate
15. Arranging to have another person take an examination for the candidate
16. Threatening or physically or verbally abusing a supervisor or proctor responsible for curbing or reporting improper conduct
17. Disclosing the contents of an examination to any other person
18. Presenting false information on an examination application
19. Failing to remain in the examination room for a minimum of two hours, the duration of the exam, or a 30 minute minimum for the afternoon portion of an examination that has distinct morning and afternoon segments
20. Failing to follow other examination instructions

The E&E Committee of the SOA will pursue any evidence that a candidate has cheated or failed to follow examination rules, either in letter or spirit. Any irregularity or suspected violation will be investigated. When a violation is confirmed, disciplinary actions may include, but are not limited to, disqualification of the candidate's examination paper and a prohibition against writing SOA examinations for a specified period. The SOA rules and regulations concerning examination administration, including disciplinary action, are comprised of the information in this Catalog, as well as the information in the *Instructions to Candidates* mailed with the Tickets of Admission, the information on the covers of examination booklets, and the material read by the supervisors during each examination administration. All candidates, on their applications for examinations, are required to read and sign the following statement:

> **"I have read the rules and regulations concerning the examination(s) for which I am applying, and agree to be bound by them. I also agree that the results of any examination(s) which I take, and any action taken as a result of my conduct (such as an irregularity, violation or cheating, and any hearings thereon) may, at the sole discretion of the SOA, be disclosed to any other bona fide actuarial organization that has a legitimate interest in such results and/or action."**

The SOA may, at its sole discretion, disclose to any other bona fide actuarial organization having a legitimate interest, information on the identity of any candidates determined to have committed a serious examination violation (those for which the penalty is greater than the simple disqualification/nullification of the examination), and the specific penalties imposed on those candidates.

Where an actuarial organization with which the SOA has a direct working relationship invokes a penalty against a candidate for an examination-related violation on an examination for which the SOA is not a joint sponsor or administrator, the SOA will invoke the same penalty on the candidate with respect to writing any SOA examinations.

Candidates will have the right to appeal the SOA's application of the disciplinary decision of another actuarial organization. Where a candidate makes such an appeal, the SOA will request the transfer of the appropriate disciplinary case files, including all direct evidence, from the other organization to the SOA for disposition of the appeal under the general provisions of the SOA disciplinary process.

If a candidate appeals an SOA examination-related disciplinary penalty to another actuarial organization invoking the same penalty based on the reciprocal agreement, the SOA will provide the relevant disciplinary case files upon receipt of formal written request from the organization, subject to the applicable SOA policies and procedures (and respecting the legitimate protection of the SOA attorney/client privileged communication). The candidate will be required to acknowledge that the appeal requires the exchange of the confidential information between the SOA and the other organization, and must provide written authorization for the release of the information to the other organization.

These standards may seem stricter than those to which candidates are accustomed in other examination environments. The SOA maintains these strict standards because the examinations are such a significant part of a candidate's career. Therefore, equitable administration of the examinations and enforcement of the highest standards of conduct cannot be emphasized too strongly. The conduct of the majority of candidates for the SOA examinations is of the highest quality.

Candidates who desire a copy of the full procedures followed in disciplinary cases should send a written request to the Ombudsperson at the SOA office address.

Credit for Examinations Passed in Other Actuarial Organizations

The BOG may waive certain requirements for passing some examinations of the SOA if the applicant has passed substantially equivalent examinations that are required by another recognized actuarial organization. Requests for these waivers should be sent to the Registrar at the SOA office.

FSAs Writing Examinations

FSAs have expressed a desire to write SOA examinations to satisfy a professional continuing education provision, or to acquire new knowledge. The SOA supports enabling FSAs with a legitimate purpose to write SOA examinations, subject to limited restrictions.

As is the case for all candidates, FSAs cannot write examinations they have previously passed unless such demonstration is required to satisfy licensing/certification continuing education requirements (e.g., Enrolled Actuaries in the U.S.).

FSAs serving on an education or examination committee may need to separate themselves from that committee involvement for a period of time before taking an examination. FSAs who are interested in writing an SOA examination but have questions about any relevant restrictions should contact the Ombudsperson at 847-706-3527 or ombudsperson@soa.org.

Joint Sponsorship

The Casualty Actuarial Society (CAS) jointly sponsors and administers Exams P, FM and C with the SOA. These three courses/exams are part of the basis for the Preliminary Education Component. They form a body of knowledge common to all actuarial candidates. The CAS actively participates with its cosponsors to set objectives, syllabus, assessments and passing standards for the courses/examinations. Validation by Educational Experience (VEE) is jointly sponsored by the SOA, CIA and CAS.

The Canadian Institute of Actuaries (CIA), with the exception of the EA examinations, sponsors and administers the Associateship and Fellowship examinations with the SOA. The CIA actively participates with its cosponsors to set objectives, syllabus, assessments and passing standards for the courses/examinations.

The SOA and the American Society of Pension Actuaries (ASPA) jointly sponsor and administer EA-1, EA-2, A and EA-2, B with the Joint Board for the Enrollment of Actuaries (JBEA). The organizations actively participate with their cosponsors to set objectives, syllabus, and assessments for the courses/examinations. Each organization may set its own pass mark.

The American Academy of Actuaries (AAA) and the Conference of Consulting Actuaries (CCA) jointly sponsor the Associateship and Fellowship examinations with the SOA.

The addresses for the above organizations can be found on the back inside cover of this catalog.

Correspondence

Requests for application forms or correspondence regarding examinations, Study Notes (SNs), classes, or other matters should be e-mailed to inforequest@soa.org, downloaded from www.soa.org, fax 847-273-8526 or mailed to:

Society of Actuaries
Information Request
475 North Martingale Road, Suite 600
Schaumburg, Illinois 60173-2226 U.S.A.

THE EDUCATION AND EXAMINATION COMMITTEE

Organizational Structure of the Education and Examination Committee

The Education and Examination (E&E) Steering and Coordinating Committee oversees the basic education program of the SOA. Within this overall committee, two separate committees operate. The Education Committee is responsible for the selection and development of the study material for the SOA basic educational programs. The Examination Committee is responsible for the development and grading of the examinations. Both of these committees report to the General Chairperson. Each of these committees has its own Chairperson and several General Officers. The E&E Committee operates under guidelines set by the SOA E&E Management Committee.

The Education Committee is responsible for determining the content of the Course of Reading and learning objectives. Input and suggestions for improvements may come from many sources, including the SOA Staff Fellows, the individual examination committees, Education Committee members, Sections and Practice Areas, the general SOA membership, academics, and candidates.

The Examination Committee consists of several individual examination committees, each responsible for specified examinations. Each examination committee develops and is responsible for the initial review of all of the questions to be included in its examinations. The committee recommends the pass marks for its examinations.

Review and Development of Course of Reading

The Course of Reading is reviewed regularly by members of the Education Committee. Both short-term and long-term goals for improvement are developed. Textbooks and articles may be selected or Study Notes (SNs) developed to be included in the Course of Reading. From time to time, new textbooks are written for the specific purpose of inclusion in the Course of Reading.

If new study material needs to be developed, or existing material needs to be revised, authors and reviewers who are experts in the area are recruited. Every effort is made to develop material that is appropriate, relevant, up-to-date, concise and well written. Suggestions for improvement are always welcome and should be sent to the Core Studies Department of the SOA office in care of the Ombudsperson.

Every effort is made to present educational material clearly and unambiguously. Occasionally, however, errors do occur. Candidates who believe that they have found an error in any study material should write to the Core Studies Department at the SOA office in care of the Ombudsperson so that any necessary corrective action may be taken.

Development of Examinations

Each examination is developed by the appropriate committee to test candidates' knowledge of the subject matter as defined in the Course of Reading in this Catalog. The officers of the individual examination committee, one or more General Officers, and where applicable, representatives of jointly administering organizations, review each examination to assure its quality.

Every effort is made to ensure that the questions fall within the scope of the Course of Reading, and that each question can be answered in the allocated time. Complete coverage of all parts of the Course of Reading is not practical for every examination every year, but the goal is to develop well-rounded examinations containing representative, high-quality questions that test the candidates' knowledge and ability to make use of material from many parts of the Course of Reading. Trick questions are avoided, and the wording of each question is carefully considered to eliminate possible ambiguities. Preliminary versions of each examination are thoroughly reviewed in relation to all of these factors before the final examination is set.

Grading Process

Multiple-choice questions are scored by optical-scanning equipment. As a check, several papers for each examination are scored by hand. Only the answer sheet determines the score. No credit, partial or full, is given for anything written in the multiple-choice examination book, except as indicated in the next paragraph and as described in the **Lost Examinations** section found within this catalog.

A multiple-choice question found to be defective may be discarded, leaving scores and rankings as they would have been if the defective question had not been asked. In this situation, the individual examination chairperson may examine the examination books of candidates with the highest failing scores to see if credit should be granted for work on the defective question. See the **Defective Questions** section within this catalog for information.

For all multiple-choice examinations, no guessing adjustment is made to candidates' scores. Therefore, candidates will maximize their scores by answering every question, even if some of those answers are pure guesses. When there is no guessing adjustment, there is never an advantage to be gained by omitting a question.

For written-answer questions, every effort is made to grade the answers according to completely objective standards. The anonymity of the candidates is fully preserved; committee members see only a candidate number when grading a written-answer examination. Each examination committee has the same grading process adjusted for the number of papers to be graded. A committee with a relatively small number of papers to grade might work as follows.

A single committee member is assigned to grade each written-answer question. The grader starts with a grading outline that lists possible items that are directly relevant to the question with numerical values set according to each item's importance. All answers are measured against the same grading outline to ensure that the same standards are applied to all candidates. Written-answer scores are then combined with multiple-choice scores.

Approximately one-third to one-half of the candidates—those with scores fairly near the expected pass mark—will have their written-answer papers regraded at a central grading session. The papers of the other candidates will not be regraded, since their scores would not change sufficiently to move from pass to fail or vice versa.

At the central grading session, a different committee member using the same grading outline independently grades each paper. If the second grader's score on a question varies from the first grader's score by more than a small defined tolerance, the two graders discuss the paper in detail and settle upon a score.

For an examination with a relatively large number of candidates, two or more graders will be assigned to each question at the beginning and procedures modified accordingly.

Papers are retained for six months in case questions or problems arise that would warrant special action. After this, the papers are destroyed.

Determination of the Pass Mark

The objective of the examinations is to identify those candidates who, as a prerequisite for qualifying for Associateship and/or Fellowship, demonstrate adequate knowledge of the Course of Reading based on standards that are formulated and applied consistently from year to year.

For the multiple-choice examinations, a panel of experts in the subject material is convened to review the examination. Each expert is asked to review each question in the examination, and assess the difficulty of that question. More specifically, they are asked to estimate the likelihood that a candidate with minimum adequate knowledge competency would answer the question correctly. The sum of these probabilities, averaged across the panel of experts, gives a preliminary estimate of the pass mark. Performance on the examinations is considered in finalizing the pass mark and especially the effect of any particularly difficult questions. For written-answer questions, the assessment process is different. A similar panel of experts is used, and a sample of actual candidate responses is used in the review. Each expert reviews each response in the sample, and makes an assessment as to how well the candidate demonstrated that they understood the material. The responses are then sorted into broad categories, relative to how close they are to the pass/fail line (in the opinion of the expert, for that particular question). The sum of the average scores of those papers closest to the pass/fail line provides a good indication of a preliminary pass mark.

There is no preconceived notion of the passing percentage. With the use of content-based pass marks, fluctuation in pass rate from session to session is expected. The final decision is reached by consultation among the Chairperson and Vice-Chairpersons of the individual examination committee and Officers of the E&E Committee and any co-administrators.

These procedures are somewhat different, however, for EA-1, EA-2, A and EA-2, B, which are jointly administered by ASPA, the Joint Board for the Enrollment of Actuaries, and the SOA. For the purposes of EA credit, the Joint Board sets the pass mark. Each of the sponsoring organizations has the right to set its own pass mark for credit towards its own educational requirements. While a common pass mark is anticipated, it is possible for the SOA pass mark to differ from the pass marks of the other sponsoring organizations.

SUGGESTIONS FOR CANDIDATES

Study Methods

For mathematical examinations, candidates should acquire proficiency with techniques and formulas by working on a large number of problems similar to those expected on the examinations.

For any examination, schedule study time so that each subject is covered adequately. Try to approach each subject from more than one perspective. Do not limit yourself to the approach taken in daily work. Maintain an interest in current developments. Knowledge of actuarial practice is helpful. The discussions of papers, unless excluded, are an essential part of the reading and should be studied as carefully as the papers themselves. Integrate the material studied. Compare programs, methods and so on. The more connections developed in the studied material, the deeper the understanding and the better the use made of the acquired information.

Maintain contact with other candidates and take advantage of the opportunities to discuss difficult topics. Do not hesitate to consult established members of the profession in your own organization or elsewhere.

Do not rely solely on commercial outlines of study material. Rather, strive to summarize knowledge of the material by adequate review prior to the examination. For written-answer examinations, try constructing "trial" examinations. These trial examinations will not only test knowledge and understanding of the Course of Reading, but they may also improve speed and confidence.

Expect integrated questions. Integrated questions encompass different sections of the material, and require the candidate to pull together various concepts into a cohesive response. This method mirrors a real-life situation, and provides a better discriminator with regard to who demonstrates understanding of the material.

Meet the Learning Objectives or Outcomes

In the SOA Basic Education Catalog, we provide a set of learning objectives or outcomes for each course. Our goal is that, by the time of the examination, candidates will have met those learning objectives or outcomes and can demonstrate that knowledge on the examination. From that perspective, it's no longer sufficient to have just gone through all the material on the syllabus. Candidates need to be confident that they have met all the learning objectives or outcomes. Note that the objectives or outcomes are stated in terms of being able to "do" something, as opposed to "knowing" something. This is a subtle difference, but important when it comes to being successful on the examination.

Structure Written-Answer Responses Accordingly

Because we are now asking questions which require more integration of material, candidates should structure their responses on the examination in a similar way. A candidate who can synthesize concepts into an organized answer will perform better than a candidate who simply recites facts. Even though the examinations contain larger questions in terms of point value, we have taken into account the fact that candidates will need time to think through the issues and formulate an integrated response. Extra time has been built into the point values for that purpose.

Become Familiar with the Case Study

All of the Course 8 examinations contain a case study. This is a good way to bring real-life applications into the study setting. A common misconception that candidates may have is that the case study is simply another study note. In fact, the case study is used to link to as much of the examination material as possible, and references to the case study will appear on the examination. It is a good idea to read through the case study before reviewing anything else on the syllabus, and refer back to the case study as new topics are covered. As a reminder, candidates will not be permitted to bring their copy of the case study into the examination room. A copy will be included in the examination booklet.

Review Classes and Seminars

Many candidates study by themselves or participate in informal study groups to prepare for examinations, but a few additional options are available. In certain areas, universities or actuarial clubs offer classes to assist candidates.

Review seminars and workshops are held at several universities and in various cities. Order forms are included with your study note order, or a listing of providers can be found on the SOA Web site under Study Notes/Information or e-mail inforequest@soa.org.

Study Manuals

Study manuals for examinations administered by the SOA are available from various sources not associated with the SOA. These products contain material such as summary outlines of Course of Reading material, various types of practice problems, and, in some cases, solutions to recent sample examination problems.

These study materials are neither a part of the Course of Reading nor a substitute for the SOA SNs; nor do they reflect any official interpretation, opinion or endorsement of the SOA or its E&E Committee.

Some book distributors carry study manuals, as shown on their order forms. Order forms for study manuals are included with the SOA SNs. A listing of these providers can be found on the SOA Web site under Study Notes/Information.

The required SOA SNs are not contained in any of these study manuals. The official SNs are available only from the SOA, and are obtained by completing the order form in the back of the printed catalog or on the Study Note/Information page on the SOA Web site. (Study notes for the Preliminary Education examinations, 5 and 6 are available electronically on the SOA Web site, www.soa.org).

Approaches to Writing Multiple-Choice Examinations

A key to success in writing multiple-choice examinations is to make steady progress through the questions. Do not spend a disproportionate amount of time on a single question with which you are having trouble. Move on, and come back to it if time is left at the end. Chances of correctly completing the greatest number of questions are increased if each question is attempted seriously at least once. It may help to determine the proportionate number of questions to answer in the first half hour of the examination, check how much ground was actually covered in that time and adjust the pace accordingly.

When pressed for time, a good strategy is to omit questions that are expected to require more than average time and use the time to complete a larger number of more quickly answered questions. For example, if a cluster of questions with a common introduction is not readily grasped, skip the entire cluster on the first attempt. Look for questions that deal with more familiar subject matter.

When answering a question, look for the quickest way possible to arrive at the correct choice and mark it on your answer sheet.

If a question is encountered for which all choices appear to be incorrect, simply move on. It later may be determined that one of the answers is correct. Also, develop shortcuts for eliminating impossible answers by checking out boundary conditions, inspecting other aspects of certain suggested solutions, or substituting numerical values.

Because there is **no** guessing adjustment, mark an answer choice on the answer sheet for every examination question.

Approaches to Writing Written-Answer Examinations

Written-answer questions are intended to elicit answers in essay and/or outline form. Numerical written-answer questions require extended numerical or formula solutions; credit given is based not only on the correct results, but also on the steps used to derive these results. Candidates should define formulas and show all work.

Paper is provided at the examination room for your answers. Take time to write legibly, since graders can only give credit for what they can read.

Each written-answer question is assigned a specified number of points. The number of points indicates the relative weighting each question bears to the total examination and to other questions and suggests the relative time that should be spent on that question. Try to distribute the examination time over all questions and limit consideration of any question to the time proportionately allotted to it. Generally, it will be more profitable to write at least a brief answer to a question for which you are relatively unprepared than to spend time refining an answer to a question on which you are well informed. No extra points are given for padding an answer.

Read each question thoroughly. Before starting to write, determine what is being asked and try to organize the intended answer. It is most important to answer the question that is asked. Points are not awarded for providing a good answer to a question not asked. It may be helpful to write a brief outline before beginning the actual answer. Answer the questions in any order. Some candidates prefer to answer the questions in the order given, while others read over the entire paper, warm up with an answer that comes easily, and gradually work into the more challenging questions.

It may be helpful to jot down on scratch paper ideas that come to mind concerning both answered and unanswered questions. (Hand in the scratch paper with the rest of your papers.) Questions may be answered in outline form, provided the meaning is clear and the question is fully answered. Another acceptable technique is to use one sheet of paper for "advantages" and another for "disadvantages," and similarly for other contrasts. This method allows going back and forth from one page to the other and putting down items as they occur. Use as much paper as needed. An uncrowded and orderly presentation can do no harm, and the use of additional pages may result in putting down further facts and considerations that earn additional credit.

If you believe that there is a better answer or approach than what is indicated in the Course of Reading (e.g., because of recent changes in regulations), it is acceptable to provide this answer, although state at the outset that this answer differs from the Course of Reading. If possible, also indicate the answer or approach given by the Course of Reading, thus demonstrating to the individual examination committee that the assigned material was read and mastered. However, there is no advantage to adding to an answer that is already complete.

Obscure interpretations should not be read into a question; each question is designed to be straightforward. Try to cover all aspects of the question in the answer, and include pertinent facts and details even if, based on practical experience, they seem obvious. However, including facts and details not pertinent to the question will waste examination time and will not earn any additional credit. Do not expand upon one or two points to the exclusion of others of equal importance. Try to state both sides of a question where called for in an answer. Do not, however, try to hedge an issue if a definitive statement is called for; no additional credit will be earned through that approach. If the question involves calculations, show all formulas and work involved in arriving at the answer. If time permits, review your answers.

In most written-answer examinations, there is an average of three minutes for every examination point. However, it may be helpful to adjust the time per question to leave some time for the initial reading of the entire paper and for a final review. Then allocate the net remaining time in proportion to the points for each question. It is well worth attempting every question; generally some credit will be earned, even if a question is only partially answered. However, when no more can be done on a question (even though some time remains for it), move on to another.

Questions will cross subject lines. Prepare for this by thoroughly understanding the interrelationship of the various subjects within each course.

Case studies will be used as the basis for questions on the Course 8 examinations. Be sure to answer the question asked by referring to the case study. For example, when asked for the advantages of a particular plan design to the company referenced in the case study, limit the response to that company. Do not list other advantages as they are extraneous to the question and will result in no additional credit. Further, if they conflict with the applicable advantages, no credit will be given.

Since each question is graded separately, each of the answers must be self-contained. An answer must not say, for example, "Part of the answer to question 1 is found in the answer to question 3." Also, each answer must be started on a new sheet of paper.

Ombudsperson

In an effort to remain responsive to the individual concerns of candidates, the SOA has an Ombudsperson. The Ombudsperson is available to respond to non-routine E&E inquiries from candidates, and to direct candidate inquiries to the appropriate staff member or department. Candidates may contact the Ombudsperson at 847-706-3527 (phone); 847-706-3599 (fax); or ombudsperson@soa.org.

COURSE OF READING AND DESCRIPTION OF SPRING 2005 EXAMINATIONS

The following Course of Reading is a guide to those preparing for the examinations. The objective of the examinations is to test the candidates' ability to grasp the underlying principles and apply them in the solution of problems.

A "#" indicates a **change** in the Course of Reading from a previous syllabus (new or revised study material, shift of study material from one examination to another, different chapter references from a previously used textbook, a new textbook or a new edition of a textbook, etc.).

If a paper or article from an actuarial or insurance publication is recommended for study, candidates should study any discussions of the papers or articles published in the same volume, unless the Course of Reading or SNs indicate otherwise. All appendices should be included as reading material unless it is stated in the syllabus that they are excluded.

An item noted as "background reading" may be helpful to the candidate in providing additional background on a topic. No examination questions will be based on an item noted as background reading.

Candidates are expected to obtain their own copies of software and texts from the distributors, publishers or actuarial organizations listed in the back of the catalog. SNs must be purchased from the SOA. The Study Note and Published Reference Order Form is located in the back of the printed catalog or on the Study Notes/Information page on the SOA Web site.

References to publications of the SOA, the CCA, the CIA, AAA and the ASB are abbreviated in the Course of Reading. These abbreviations can be found in the Miscellaneous Information section.

Study Notes

General Information

Candidates are urged to obtain SNs for any examination that they plan to take. SNs for the Preliminary Education examinations and Courses 5 and 6 are available electronically on the SOA Web site, www.soa.org.

The E&E Committee publishes SNs to help candidates prepare for the examinations. In some instances, SNs are the principal references; in others, they are designed to coordinate the subject for the candidate or to complement other readings.

Sample questions, illustrative solutions, and answer keys for the Preliminary Education examinations, Courses 6, 7 pre-test, and 8 are available as part of the set of SNs.

Introductory Study Notes (ISNs) contain important information about the examinations, including any changes to the Course of Reading, changes in examination times or dates, errata and descriptions of examination formats.

Occasionally, the Course of Reading for an examination may be changed after publication of the Catalog. Such a change will be announced in the ISN for the affected examination. *If any conflict exists between information contained in this Catalog and that contained in the ISNs, the ISN will govern.* Additional corrections or notices to the Course of Reading that are made after the initial release of the ISNs, will be mailed to the candidates who order the study notes. These notices will also be posted on the SOA Web site under Education and Jobs/Candidate and Exam Information/Spring 2005 Basic Education Catalog - Study Notes Information. Candidates should be sure to check this site periodically.

Ordering SNs

Paper copies of SNs for the Preliminary Examinations may be ordered after January 1 for the spring administration and July 1 for the fall administration. SNs for the Preliminary Examinations and Courses 5 and 6 are also available on the SOA Web site.

SNs may be ordered after December 1 for Course 6 and June 1 for Courses 5 and 8. Course 7 pre-test study notes may be ordered throughout the year and are periodically updated. Check the order form for more details. SNs for Courses 5, 6 and 8 are available in two forms—Complete Sets (which contain all material, including revisions) or Revisions Only. The Complete Set contains the ISN, at least one sample examination for the course, and all SNs on the syllabus for the course. The Revisions Only package contains the ISN, the most recently released sample examination for the course, and those SNs that are new to the syllabus or that have been revised since the previous administration of the respective examination. Candidates who are writing the course examination for the first time should order a Complete Set of SNs rather than the Revisions Only package.

Study Note fees are listed on the order form at the back of this catalog. The completed order form, together with the total payment (check or money order in U.S. funds, payable to the **SOA**; or charged to American Express, MasterCard or Visa) should be sent to the address on the order form. **SN fees are non refundable**.

In referring to the sample questions, candidates should keep in mind that the questions are intended to serve as a study aid, and that the actual examinations may vary somewhat as to the proportion of question styles and subjects. New forms of questions may appear, and certain forms may not be used in the future.

Questions concerning SNs or SN orders should be directed to the Publication Orders Manager at 847-706-3525 or azionce@soa.org.

PRELIMINARY EDUCATION COMPONENT

Validation by Educational Experience (VEE)

There are three topics that will require Validation by Educational Experience (VEE). Validation of these topics is required in addition to four Preliminary Education examinations referenced in this catalog. The SOA in conjunction with the CIA and CAS has implemented VEE requirements for the following topics.

- VEE-Applied Statistical Methods
- VEE-Corporate Finance
- VEE-Economics

Please note that after 2004 the VEE topics of Economics, Corporate Finance and Applied Statistics will no longer be tested on the preliminary exams. Those candidates with credit for Course 2 will have credit for VEE-Economics and VEE-Corporate Finance. Those candidates with credit for Course 4 will have credit for VEE-Applied Statistical Methods. VEE topics are not prerequisites for the preliminary examinations and may be fulfilled independently of the preliminary exam process.

VEE Process - Four Ways to Get VEE Credit

Candidates without credit for Courses 2 and 4 at the end for 2004 can accomplish VEE credit in one of four ways:

1. **College Course(s)**
   Complete one or more courses offered by a college or university and approved by the CAS, CIA, and SOA. Candidates must receive a grade of B- or better in each course. If the institution does not use letter grading, an appropriate translation will be determined.
2. **Standardized Examination**
   Achieve a pre-set score on a standardized examination as determined by the CAS, CIA, and SOA. Specified score minimums on the Advanced Placement (AP) and College Level Examination Program (CLEP) tests for micro and macroeconomics will be accepted as VEE credit for economics. The VEE Administration Committee (VEEAC) will determine which other examinations qualify and the score required for credit.
3. **Other Educational Experiences**
   Complete other educational experiences as approved by the CAS, CIA, and SOA. The organizations are currently identifying appropriate alternatives.
4. **Transitional VEE Exams**
   Achieve a passing grade on a CAS transitional VEE exam that will be offered through at least 2006. More information on the CAS transitional VEE exams can be found on the CAS web site at http://www.casact.org/admissions/news/vffexams.htm

Step 1: Approval of Courses/Experiences

The VEE Administration Committee determines which college courses, standardized exams, and other educational experiences are appropriate for VEE credit. Before a candidate may submit an application to receive individual credit for a VEE topic, the course or educational experience itself must first be approved.

All approved courses/experiences will be listed in the "Directory of Approved VEE Courses/Experiences" available on the SOA Web Site. This directory identifies the educational institution, the approved courses/experiences by VEE topic, a unique approval code for each course/experience, and the years for which the courses/experiences are approved.

If a VEE Course/Experience does not appear in the Directory, approval must be requested by completing an official application form and submitting it along with the required documentation. The course/experience approval application is available in this catalog and on the web site. The guidelines for course approval can be found at the end of this section.

NOTE: In 2004, only educational institutions may submit course/experience applications for approval. The initial version of the "Directory of Approved VEE Courses/Experiences" will be posted on the web site and updated regularly. Beginning in January 2005, candidates may begin to submit course/experience applications for approval if their course/experience is not already listed in the directory. (Alternatively they may wish to contact the institution they attended and request that the institution submit an approval request.)

Step 2: Approval of Individual VEE Credits for Candidates

Beginning in January 2005, candidates who have credit for at least two actuarial examinations may submit applications for their own VEE credits. In addition to the applications, candidates are required to arrange for an official transcript(s) to be submitted to the VEE Administrator. The special "Application for Validation by Educational Experience Credit," is available in this catalog and online. Only courses/experiences that are listed in the "Directory of Approved VEE Courses/Experiences" may be used for VEE credit.

Once a candidate's application and documentation of the required grade on an approved course/experience has been validated, credit for the specific VEE topic will be granted. The candidate will be sent a response to each application.

Guidelines for Approval of VEE Courses and Experiences

The following guidelines for the three VEE requirements will be used by the VEE Administration Committee to determine whether or not specific courses or educational experiences are appropriate to fulfill the VEE requirements.

VEE–Applied Statistical Methods
Courses that meet this requirement may be taught in the mathematics, statistics, or economics department, or in the business school. In economics departments, this course may be called Econometrics. The material could be covered by one course or two. The mathematical sophistication of these courses will vary widely and all levels are intended to be acceptable. Most of the topics listed below should be covered:

Regression analysis
- Least square estimates of parameters
- Single linear regression
- Multiple linear regression
- Hypothesis testing and confidence intervals in linear regression models
- Testing of models, data analysis and appropriateness of models

Time series
- Linear time series models
- Moving average, autoregressive and/or ARIMA models
- Estimation, data analysis and forecasting with time series models
- Forecast errors and confidence intervals

VEE–Corporate Finance
The typical corporate finance sequence in a business school consists of an introductory semester followed by an advanced semester. The advanced semester will more likely be the one that aligns with the learning objectives.

The standard validation method will be completion of the second semester of a two-semester corporate finance sequence. Generally, only the second semester course grade will be evaluated unless this is a narrow course in which case ***both*** the first and second semester course grades will be evaluated. The

exceptional case where the corporate finance material is covered in one course only will also be considered.

Most of the topics in each category listed below should be covered:

Finance
- Definitions of key finance terms: stock company; capital structure
- Key finance concepts: financing companies; characteristics and uses of financial instruments; sources of capital; cost of capital; dividend policy; personal and corporate taxation
- actors to be considered by a company when deciding on its capital structure and dividend policy
- Impact of financial leverage and long/short term financing policies on capital structure
- Characteristics of the principal forms of financial instruments issued or used by companies, and the ways in which they may be issued
- How a company's cost of capital relates to the investment projects the company wishes to undertake

Investment
- Key finance concepts: option pricing theory and stock valuation
- Definitions of key finance terms: financial instruments – bond, stock, basic options (calls, puts); dividends; price to earnings ratio
- Structure of a stock company and the different methods by which it may be financed
- Calculate value of stocks
- Calculate value of options
- Measures of financial performance: balance sheet; income statement; statement of cash flows; financial ratios (e.g. leverage, liquidity, profitability, market value ratios); net present value: the payback, discounted payback models; internal rate of return and profitability index models
- Assessment of financial performance using various measures: balance sheet; income statement; statement of cash flows, financial ratios (e.g. leverage, liquidity, profitability, market value ratios); net present value; the payback, discounted payback models; internal rate of return and profitability index models

VEE–Economics
Typically, the VEE requirement for economics will be met if a candidate has completed two introductory economics courses, one course covering microeconomics and the other covering macroeconomics. Most of the topics listed below should be covered:

Microeconomics
- Interaction between supply and demand in the provision of a product and the way in which equilibrium market prices are determined
- Elasticity of demand and supply and the effects on a market of different levels of elasticity
- How rational utility maximizing agents make consumption choices
- How profit-maximizing firms make short run and long run production choices
- Different types of competition, or lack of it, and the practical effect on supply and demand

Macroeconomics
- Structure of public sector finances of an industrialized economy
- GDP, GNP, and Net National Product. How these concepts are used in describing the economy and in making comparisons between countries, and their limitations
- Propensity to save or to consume by the private sector or the corporate sector and how it affects the economy
- Impact of fiscal and monetary policy and other forms of government intervention on different aspects of the economy, and in particular on financial markets
- Role of exchange rates and international trade in the economy and the meaning of the term balance of payments
- Major factors affecting the rate of inflation, the level of interest rates, the exchange rate, the level of unemployment, and the rate of economic growth in the economy of an industrialized country

Additional information on the VEE requirements can be found on the SOA web site at http://www.soa.org/ccm/content/exams-education-jobs/education-redesign/process-for-validation-by-educational-experience/

Specific questions may be sent to vee@soa.org.

Exam P Probability

The examination for this material consists of 3 hours of multiple-choice questions and is identical to CAS Exam 1.

The purpose of this course of reading is to develop knowledge of the fundamental probability tools for quantitatively assessing risk. The application of these tools to problems encountered in actuarial science is emphasized. A thorough command of probability topics and the supporting calculus is assumed. Additionally, a very basic knowledge of insurance and risk management is assumed.

A table of values for the normal distribution will be included with the examination booklet.

LEARNING OUTCOMES

Candidates should be able to use and apply the following concepts in a risk management context:

1. General Probability

    - Set functions including set notation and basic elements of probability
    - Mutually exclusive events
    - Addition and multiplication rules
    - Independence of events
    - Combinatorial probability
    - Conditional probability
    - Law of total probability
    - Bayes' Theorem

2. Univariate probability distributions (including binomial, negative binomial, geometric, hypergeometric, Poisson, uniform, exponential, chi-square, beta, Pareto, lognormal, gamma, Weibull, and normal).

    - Probability functions and probability density functions
    - Cumulative distribution functions
    - Mode, median, percentiles, and moments
    - Variance and measures of dispersion
    - Moment generating functions
    - Transformations

3. Multivariate probability distributions (including the bivariate normal)

    - Joint probability functions and joint probability density functions
    - Joint cumulative distribution functions
    - Central Limit Theorem
    - Conditional and marginal probability distributions
    - Moments for joint, conditional, and marginal probability distributions
    - Joint moment generating functions
    - Variance and measures of dispersion for conditional and marginal probability distributions
    - Covariance and correlation coefficients
    - Transformations and order statistics
    - Probabilities and moments for linear combinations of independent random variables

Suggested Texts

There is no single required text for this exam. The texts listed below may be considered as representative of the many texts available to cover material on which the candidate may be examined.

Not all the topics may be covered adequately by just one text. You may wish to use more than one of the following or other texts of your choosing in your preparation. Earlier or later editions may also be adequate for review.

- *A First Course in Probability* (Sixth Edition), 2001, by Ross, S.M., Chapters 1–8.
- # *Fundamentals of Probability* (Third Edition), 2005, by Ghahramani, S., Chapters 1–11.
- # *John E. Freund's Mathematical Statistics with Applications (*Seventh Edition), 2004, by Miller, I., Miller, M., Chapters 1-8.
- # *Mathematical Statistics with Applications (Sixth Edition), 2002,* by Wackerly, D., Mendenhall III, W. Scheaffer*,* R., Chapters 1-7.
- *Probability for Risk Management*, 1999, by Hassett, M. and Stewart, D., Chapters 1–11.
- *Probability: The Science of Uncertainty with Applications to Investments, Insurance and Engineering 2*001, by Bean, M.A., Chapters 1–9.

Study Notes

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Code	**Title**
P-05-05#	P Introductory Study Note
P-09-05#	P Sample Exam Questions and Solutions
P-21-05#	Risk and Insurance

Exam FM Financial Mathematics

The examination for this material consists of two hours of multiple-choice questions and is identical to CAS Exam 2.

The goal of the Financial Mathematics course of reading is to provide an understanding of the fundamental concepts of financial mathematics, and how those concepts are applied in calculating present and accumulated values for various streams of cash flows as a basis for future use in: reserving, valuation, pricing, duration calculation, asset/liability management, investment income, capital budgeting and valuing contingent cash flows.

The following learning outcomes are presented with the understanding that candidates are allowed to use specified calculators on the exam. The education and examination of candidates should reflect that fact. In particular, such calculators eliminate the need for candidates to learn and be examined on certain mathematical methods of approximation.

LEARNING OUTCOMES

1. Candidates will know definitions of key terms of financial mathematics: inflation; rates of interest [simple, compound (interest and discount), real, nominal, effective, dollar-weighted, time-weighted, spot, forward], term structure of interest rates; force of interest (constant and varying); equivalent measures of interest; yield rate; principal; equation of value; present value; future value; current value; net present value; accumulation function; discount function; annuity certain (immediate and due); perpetuity (immediate and due); stocks (common and preferred); bonds (including zero-coupon bonds); other financial instruments such as mutual funds, and guaranteed investment contracts.

   Specifically, candidates are expected to demonstrate the ability to:
   a. Choose the term, given a definition
   b. Define a given term
   c. Determine an equation of value, given a valuation problem involving one or more sets of cash flows at specified times

2. Candidates will understand key procedures of the financial mathematics: determining equivalent measures of interest; discounting; accumulating; determining yield rates; estimating the rate of return on a fund; amortization

   Specifically, candidates are expected to demonstrate the ability to:
   a. Calculate the equivalent annual effective rate of interest, given a nominal annual rate and a frequency of interest conversion, discrete or continuous, other than annual.
   b. Calculate the equivalent effective rate of interest per payment period given a payment period different from the interest conversion period.
   c. Estimate the interest return on a fund
   d. Calculate the appropriate equivalent single value (present value, net present value, future (accumulated) value or combination), given a set of cash flows (level or varying), an appropriate term structure of interest rates, the method of crediting interest (e.g., portfolio or investment year) as necessary, an appropriate set of inflation rates as necessary, and accounting for reinvestment interest rates as necessary; for example:
      i. Calculate the loan amount or outstanding loan balance, given a set of loan payments (level or varying) and the desired yield rate (level or varying)
      ii. Calculate the price of a bond (callable or non-callable), given the bond coupons, the redemption value, the term of the bond (constant or varying), the coupon interest rate, and the desired yield rate (level or varying)
      iii. Calculate the value of a stock, given the pattern of dividends and the desired yield rate (level or varying)
      iv. Calculate the net present value, given a set of investment contributions and investment returns

e. Calculate a unique yield rate, when it exists, given a set of investment cash flows
f. Calculate the amount(s) of investment contributions, given there is more than one contribution, and given a set of yield rates, the amount(s) and timing of investment return(s), and the desired timing of the investment contributions
g. Calculate the amount(s) of investment returns, given there is more than one return, and given a set of yield rates, the amount(s) and timing of investment contribution(s) and the desired timing of the investment returns; for example:

    i. Calculate loan payments, given the loan amount(s), the term of the loan, and the desired yield rate (level or varying)
    ii. Calculate the principal and interest portions of a loan payment, given the loan amount, the set of loan payments (level or varying), and a set of interest rates (level or varying)
    iii. Calculate bond coupons or redemption values, given the bond price, the term of the bond, and the desired yield rate (level or varying)

h. Calculate the term of an investment, given a set of cash flows (level or varying), and a set of interest rates (level or varying); for example
    i. Calculate the length of time required to accumulate a given amount, given the yield rate and an initial amount
    ii. Calculate the length of time to repay a given loan amount, given the loan payments and the loan interest rate(s)
    iii. Calculate the time to maturity of a bond, given the price of the bond, the coupon payments, redemption value, and yield rate

3. Candidates will know <u>definitions</u> of key terms of modern financial analysis at an introductory and intuitive level, and be able to complete basic calculations involving such terms: yield curves, spot rates, forward rates, duration, convexity, immunization, and short sales.

   Specifically, candidates are expected to demonstrate the ability to:
   a. Choose the term, given a definition
   b. Write the definition, given a term
   c. Perform calculations such as:

      i. yield rate on a short sale
      ii. measuring interest rate risk using duration and convexity
      iii. basic immunization calculations

Note that probability-based calculations for applications of financial mathematics are in Exam M.

Suggested Texts

The Candidate may use either of the options shown below. Knowledge and understanding of financial mathematics concepts are significantly enhanced through working out problems based on those concepts. Thus in preparing for the Financial Mathematics examination, whichever of the source of textbooks students choose to use, students are encouraged to work out the textbook exercises related to the listed readings.

OPTION A

- *Theory of Interest* (Second Edition), 1991*,* by Kellison, S.G., Chapters 1-2, Chapter 3 (exclude 3.6 and 3.10), Chapter 4, Section 4.1 and the rest of page 95 , Examples 4.1 and 4.2, Sections 4.4–4.8, Chapter 5, Sections 5.1–5.7, Chapter 6, Sections 6.1–6.4 and 6.6, Chapter 7, Sections 7.1–7.7 and 7.10, Chapter 8, Sections 8.7 and 8.8 (exclude Options, Futures, Forwards and Swaps), Chapter 9, Sections 9.4, 9.6, 9.8–9.10, Appendix VIII.

OPTION B

- # *Mathematics of Investment and Credit* (Third Edition), 2004, by Broverman, S.A., Chapter 1 through section 1.6, Chapter 2 through section 2.4 (excluding 2.4.2 and 2.4.3), Chapter 3 through section 3.3 (excluding pages 188–189), Chapter 4 through section 4.3.1, Chapter 5 through section 5.3 (excluding 5.1.3, 5.1.4 and 5.3.2), Chapter 6 through section 6.3 (excluding 6.2), Chapter 7 through section 7.2, Chapter 8, sections 8.2.1, 8.2.2, 8.2.4, 8.3.1–8.3.3.

OPTION C

- # *Mathematics of Investment and Credit* (Second Edition), 1996, by Broverman, S.A., Chapter 1, Sections 1.1–1.7, Chapter 2, Sections 2.1–2.9, Chapter 3, Sections 3.1–3.3, Section 3.4 (exclude bottom of page 159 (interest preference rates) through top of page 161), Sections 3.5.2, 3.5.3, Chapter 4, Sections 4.1–4.4, 4.5.2, 4.5.3, 4.5.4, Chapter 6, Sections 6.1, 6.2 (exclude discussion of interest rate swaps), 6.3.1 (through solution of Example 6.2 only), 6.6.
- Supplements to the 2nd Edition of *Mathematics of Investment and Credit,* (ACTEX, http://www.actexmadriver.com/actex_pages/actex_downlods2.cfm)

Study Notes

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Code	Title
FM-05-05#	FM Introductory Study Note
FM-09-05#	FM Sample Exam Questions and Solutions
FM-22-05#	Review of Calculator Functions for the Texas Instruments BA-35
FM-23-05#	Review of Calculator Functions for the Texas Instruments BA II Plus

Exam M Actuarial Models

The examination for this material consists of four hours of multiple-choice questions.

This material develops the candidate's knowledge of the theoretical basis of actuarial models and the application of those models to insurance and other financial risks. A thorough knowledge of calculus, probability and interest theory is assumed. Knowledge of risk management at the level of Exam P is also assumed.

The candidate will be required to understand, in an actuarial context, what is meant by the word "model," how and why models are used, their advantages and their limitations. The candidate will be expected to understand what important results can be obtained from these models for the purpose of making business decisions, and what approaches can be used to determine these results.

A variety of tables will be provided to the candidate in the study note package and at the examination. These include values for the standard normal distribution, illustrative life tables, and abridged inventories of discrete and continuous probability distributions. These tables are also available on the SOA Web site. Since they will be included with the examination, candidates will not be allowed to bring copies of the tables into the examination room.

LEARNING OUTCOMES

A. Survival and severity models.
   1. Define survival-time random variables
      a) for one life, both in the single- and multiple-decrement models;
      b) for two lives, where the lives are independent or dependent (including the common shock model);

      whether they be left-truncated, right-censored, both, or neither.
   2. Assuming a uniform distribution of deaths, define the continuous survival-time random variable that arises from the discrete survival-time random variable.
   3. Define severity random variables
      a) with or without a deductible;
      b) with or without a limit;
      c) with or without coinsurance.
   4. For any survival-time or severity random variable defined above, with single or mixed distributions, calculate
      a) expected values;
      b) variances;
      c) probabilities;
      d) percentiles.
   5. Define non-homogeneous and homogeneous discrete-time Markov Chain models and calculate the probabilities of
      a) being in a particular state;
      b) transitioning between particular states.

B. Frequency models.
   1. Define and calculate expected values, variances and probabilities for frequency random variables
      a) under the Poisson distribution;
      b) under the Binomial distribution;
      c) under the Negative Binomial distribution;
      d) under the Geometric distribution;
      e) under any mixture of the above.
   2. Define and calculate expected values, variances and probabilities for Poisson processes,
      a) using increments in the homogeneous case;
      b) using interevent times in the homogeneous case;
      c) using increments in the non-homogeneous case;
      d) resulting from special types of events in the Poisson process;
      e) resulting from sums of independent Poisson processes.

C. Compound (aggregate) models.
   1. Define compound random variables, combining severity distributions with frequency distributions and Poisson processes.
   2. Calculate, for the compound random variables defined above,
      a) expected values, including recursion for aggregate deductibles (stop-loss insurance);
      b) variances;
      c) probabilities.

D. Life contingencies
   1. Define present-value-of-benefit random variables for life insurances defined on survival-time random variables
      a) for one life, both in the single- and multiple-decrement models;
      b) for two lives, where the lives are independent or dependent (including the common shock model).
   2. Define present-value-of-benefit random variables for annuities defined on survival-time random variables
      a) for one life, in the single-and multiple-decrement models;
      b) for two lives, where the lives are independent or dependent (including the common shock model).
   3. Calculate the expected values, variances and probabilities for present-value-of-benefit random variables for the life insurances and annuities described above.
   4. Define and calculate the expected values, variances and probabilities for the present-value-of-loss-at-issue random variables, as a function of the considerations (premiums), for the life insurances and annuities described above.
   5. Calculate considerations (premiums) for life insurances and annuities,
      a) using the Equivalence Principle;
      b) using percentiles.
   6. Define and calculate the expected values, variances and probabilities for the present-value-of-future-loss random variables for life insurances and annuities.
   7. Calculate liabilities, analyzing the present-value-of-future-loss random variables for life insurances and annuities,
      a) using the prospective method;
      b) using the retrospective method;
      c) using special formulas.
   8. Using recursion, calculate expected values (reserves) and variances of present-value-of-future-loss random variables for general fully-discrete life insurances written on a single life.
   9. For the life insurances and annuities described above, calculate
      a) gross considerations (expense-loaded premiums);
      b) expense-loaded liabilities (reserves);
      c) asset shares.
   10. Extending present-value-of-benefit, present-value-of-loss-at-issue, present-value-of-future-loss random variables and liabilities to discrete-time Markov Chain models, calculate
      a) actuarial present values of cash flows at transitions between states;
      b) actuarial present values of cash flows while in a state;
      c) considerations (premiums) using the Equivalence Principle;
      d) liabilities (reserves) using the prospective method.

Note: Concepts, principles and techniques needed for Exam M are covered in the references listed below. Candidates and professional educators may use other references, but candidates should be very familiar with the notation and terminology used in the listed references.

Texts

- *Actuarial Mathematics* (Second Edition), 1997, by Bowers, N.L., Gerber, H.U., Hickman, J.C., Jones, D.A. and Nesbitt, C.J., Chapter 3 , Sections 3.1–3.3, 3.5, 3.6 (excluding constant force and hyperbolic assumptions), 3.7 and 3.8, Chapter 4, Sections 4.1–-4.4, Chapter 5, Sections 5.1–5.4, Chapter 6, Sections 6.1(excluding utility-theory approach), 6.2–6.4, Chapter 7, Sections 7.1(excluding utility-theory approach), 7.2–7.6, Chapter 8, Sections 8.1–8.2, 8.3 (**only** the recursion in Equation 8.3.9 and

its equivalent variants), 8.4 (**only** Equation 8.4.6 for UDD and its equivalent variants), Chapter 9, Sections 9.1–9.5, 9.6.1, 9.7, Chapter 10, Sections 10.1–10.3, 10.5–10.5.1, 10.5.4, 10.6, Chapter 11, Sections 11.1–11.3 and Chapter 15, Sections 15.1–15.2.1, 15.4, 15.6–15.6.1.

- *Introduction to Probability Models* (Eighth Edition), 2003, by Ross, S.M., Chapter 5, Sections 5.3.1, 5.3.2 (through Definition 5.1), 5.3.3, 5.3.4 (through Example 5.14 but excluding Example 5.13), Proposition 5.3 and the preceding paragraph, Example 5.18, 5.4.1(up to example 5.23**),** 5.4.2 (excluding Example 5.25), 5.4.3, and Exercise 40.
- # *Loss Models: From Data to Decisions,* (Second Edition) 2004, by Klugman, S.A., Panjer, H.H., and Willmot, G.E., Chapter 2 (**background only),** Chapter 3 (**background only),** Chapter 4, Sections 4.1–4.4 (excluding data-dependent distributions), 4.6.1–4.6.5, 4.6.7 through Theorem 4.51 (excluding zero-modified distributions, in particular Example 4.46 and Theorem 4.49), 4.6.9–4.6.11, Chapter 5, Sections 5.1–5.6, Chapter 6, Sections 6.1–6.3, 6.7 (excluding discretization), Chapter 8, Section 8.1.1.

Study Notes

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Code	**Title**
M-05-05#	M Introductory Study Note
M-09-05#	M Sample Exam Questions and Solutions
M-24-05#	Multi-State Transition Models with Actuarial Applications
M-25-05#	Section 8.5 from the second printing of *Actuarial Mathematics,* Second Edition (only the variance recursion given by Equation 8.5.16 with i=1)

Exam C Construction and Evaluation of Actuarial Models

The examination for this material consists of four hours of multiple-choice questions and is identical to CAS Exam 4.

This material provides an introduction to modeling and covers important actuarial methods that are useful in modeling. A thorough knowledge of calculus, probability and mathematical statistics is assumed.

The candidate will be required to understand the steps involved in the modeling process and how to carry out these steps in solving business problems. The candidate should be able to: 1) analyze data from an application in a business context; 2) determine a suitable model including parameter values; and 3) provide measures of confidence for decisions based upon the model. The candidate will be introduced to a variety of tools for the calibration and evaluation of the models on Exam M.

A variety of tables will be provided to the candidate in the study note package and at the examination. These include values for the standard normal distribution, chi-square distribution, *t* distribution, *F* distribution, and abridged inventories of discrete and continuous probability distributions. These tables are also available on the SOA and CAS Web sites. Since they will be included with the examination, candidates will not be allowed to bring copies of the tables into the examination room.

LEARNING OUTCOMES

The candidate is expected to apply statistical methods to sample data to quantify and evaluate models presented in SOA Exam M or CAS Exam 3. The candidate is further expected to identify steps in the modeling process, understand the underlying assumptions implicit in each family of models, and recognize which assumptions are applicable in a given business application.

Specifically, the candidate is expected to be able to perform the tasks listed below:

LEARNING OUTCOMES

A. Construction of Empirical Models

- Estimate failure time and loss distributions using
  - Kaplan-Meier estimator, including approximations for large data sets
  - Nelson-Aalen estimator
  - Kernel density estimators
- Estimate the variance of estimators and confidence intervals for failure time and loss distributions.
- Estimate failure time and loss distributions with the Cox proportional hazards model and other basic models with covariates.
- Apply the following concepts in estimating failure time and loss distribution
  - Unbiasedness
  - Consistency
  - Mean squared error

B. Construction and Selection of Parametric Models

- Estimate the parameters of failure time and loss distributions using
  - Maximum likelihood
  - Method of moments
  - Percentile matching
  - Bayesian procedures
- Estimate the parameters of failure time and loss distributions with censored and/or truncated data using maximum likelihood.
- Estimate the variance of estimators and the confidence intervals for the parameters and functions of parameters of failure time and loss distributions.
- Apply the following concepts in estimating failure time and loss distributions
  - Unbiasedness
  - Asymptotic unbiasedness
  - Consistency
  - Mean squared error

    - Uniform minimum variance
- Determine the acceptability of a fitted model using
    - Graphical procedures
    - Kolmogorov-Smirnov test
    - Anderson-Darling test
    - Chi-square goodness-of-fit test
    - Likelihood ratio test

C. Credibility
- Apply limited fluctuation (classical) credibility including criteria for both full and partial credibility.
- Perform Bayesian analysis using both discrete and continuous models.
- Apply Bühlmann and Bühlmann-Straub models and understand the relationship of these to the Bayesian model.
- Apply conjugate priors in Bayesian analysis and in particular the Poisson-gamma model.
- Apply empirical Bayesian methods in the nonparametric and semiparametric cases.

D. Interpolation and Smoothing
- Demonstrate an understanding of the purpose of smoothing data.
- Apply polynomial splines, and cubic splines in particular to actuarial data.

E. Simulation
- Simulate both discrete and continuous random variables using the inversion method.
- Estimate the number of simulations needed to obtain an estimate with a given error and a given degree of confidence.
- Use simulation to determine the p-value for a hypothesis test.
- Use the bootstrap method to estimate the mean squared error of an estimator.
- Apply simulation methods within the context of actuarial models.

Texts
- # *Loss Models: From Data to Decisions,* (Second Edition), 2004, by Klugman, S.A., Panjer, H.H. and Willmot, G.E., Chapter 1, Section 1.1 only, Chapters 9–11, Chapter 12 (excluding 12.5.4, 12.5.5 and 12.6), Chapter 13, Chapter 15 and Chapter 17.

Reading Options for Credibility
The candidate may use any of the alternatives shown below.

Option A
- # *Loss Models: From Data to Decisions,* (Second Edition), 2004, by Klugman, S.A., Panjer, H.H., and Willmot, G.E., Chapter 16, Sections 16.3, 16.4 (excluding16.4.7), 16.5 (excluding 16.5.3, 16.1 (**background only),** 16.2 (**background only).**

Option B
- *Foundations of Casualty Actuarial Science* (Fourth Edition), 2001, Casualty Actuarial Society, Chapter 8, “Credibility”, by Mahler, H.C., and Dean C.G., Section 1 (**background only**) Sections 2–5 **(Available as SN C-21-01)**.
- *Topics in Credibility Theory* (Study Note C-24-05) by Dean, C.G.

Option C
- # *Introduction to Credibility Theory* (Third Edition), 1999, Herzog, T.N., Chapter 1-3 (**background only),** 4–8, and 9 (**background only).**

Study Notes

SNs for the Preliminary Education examinations and Course 6 are available on the SOA Web site under Education and Jobs/Candidate and Exam Information/Spring Exam Session/Spring 2005 Basic Education Catalog – Study Notes Information. Hard copies may be purchased by using the Study Note and Published Reference order form in the back of the printed catalog or by downloading the form from the Spring Exam Session Web page.

Code	**Title**
C-05-05#	C Introductory Study Note
C-09-05#	C Sample Exam Questions and Solutions
C-21-01	Credibility
C-24-05#	Topics in Credibility Theory (**to be used with Option B only)**

Course 6 Finance and Investments

The examination for this course consists of five hours of multiple-choice and written-answer questions. A read-through time will be given prior to the start of the exam, 15 minutes in the morning session and 10 minutes in the afternoon session.

This course extends the candidate's knowledge of basic actuarial principles in the fields of investments and asset management. Candidates completing this course will have developed some expertise in the areas of capital markets, investment vehicles, applications of derivatives, principles of portfolio management and asset-liability management.

A "Course Overview" study note 6-20-02 has been prepared for this course. It is intended to give candidates additional insights into the Course of Reading as well as a possible approach to take when studying the various sections of the course.

LEARNING OBJECTIVES

The candidate is expected to be able to perform the following actions:

1. Identify and evaluate the risk and return characteristics of various types of investments.
   - Explain the risks to which an investor may be exposed.
   - Evaluate the relationship between risk and return in the investment markets.
   - Explain the general design features and risk characteristics of fixed income and equity investments.
   - Evaluate the risk and return characteristics of government and corporate debt securities.
   - Evaluate the risk and return characteristics of real estate securities.
   - Evaluate the risk and return characteristics of Guaranteed Investment Contracts (GICs).
2. Identify how markets operate and explain the fundamental principles of modern portfolio theory.
   - Explain how individual securities are valued and traded.
   - Evaluate the risk/return trade-off from an investor's perspective.
   - Explain the term structure of interest rates including the yield curve and pricing of fixed income securities and spot and forward rates of interest.
   - Explain the Capital Asset Pricing model (CAPM) and its application to portfolio management.
   - Discuss the properties of the Markowitz Portfolio Selection model.
   - Evaluate the three versions of the efficient market hypothesis and explain their application to portfolio management.
   - Discuss the impact of investment diversification upon portfolio management.
   - Explain arbitrage pricing theory and its application to portfolio management.
   - Discuss the impact of behavioral finance on asset prices and financial markets.
3. Determine how options are priced in financial markets.
   - Evaluate the features and risk/return characteristics of financial derivatives including put and call options, swaps, forwards, interest rate caps, floors and compound options.
   - Evaluate the factors that affect the value of an option.
   - Identify the principles and applications of no arbitrage pricing models.
   - Apply binomial option pricing techniques.
   - Determine how options are priced using the Black-Scholes model.
4. Determine the value of cash flow streams with embedded options.
   - Calculate option-adjusted spreads including the impact of prepay on Mortgage-Backed Securities.
   - Apply option-adjusted pricing techniques to Mortgage-Backed Securities and other financial instruments.
   - Determine the cost and price-yield relationship of an embedded option in a series of cash flows.
5. Apply the concepts of interest rate risk management and effective duration.
   - Explain the concepts of immunization including modern refinements and practical limitations.
   - Calculate an effective duration measure using option-adjusted spread analysis.
6. Explain how principles of asset liability management (ALM) impact portfolio construction and management for institutional investors.

- Evaluate the impact of liquidity requirements, valuation concerns, cash flow variability, regulatory constraints and investment management mandates in developing investment policies and strategies for insurance and other financial companies and pension plans.
- Apply ALM principles to the establishment of investment policy and strategy including asset allocation.
- Determine the impact of interest rate risk analysis on portfolio construction.
- Apply matched funding and dedicated portfolio management strategies to control interest rate risk.

7. Identify and apply portfolio management techniques to the ongoing investment management of financial institution and pension fund assets.
   - Explain principles of risk-based capital management and their impact upon portfolio management.
   - Apply principles of active and passive investment management techniques to equity and fixed income portfolios.
   - Evaluate key considerations in developing investment policies and strategies for financial institutions and pension plans.
   - Identify key considerations in managing surplus pension funds.
   - Identify and apply the obligations of a fiduciary in managing investment portfolios.
   - Describe liquidity requirements of an investor and their impact upon portfolio management.

Concepts, principles and techniques needed for Course 6 are covered in the references listed below. Candidates and professional educators may use other references, but candidates should be very familiar with the notation and terminology used in the listed references.

Texts

- *Bond Portfolio Management*, (Second Edition), 2001, by Fabozzi, F.J., editor, Chapters 2, 15–16.
- # *Investments*, (Sixth Edition), 2005, by Bodie, Z., Kane, A., and Marcus, A., Chapters 1 (background only), 2–5, 6 (excluding appendix), 7, 8 (excluding appendix), 9–12 and 25.
- *Financial Economics*, 1998, by Panjer, H.H., editor, Chapters 2 (sections 1–6 only), 3, 5–6.
- *Handbook of Fixed Income Securities*, (Sixth Edition), 2000, by Fabozzi, F.J., Chapters 1–2, 5–6, 8, 11, 14, 24, 25, (pp. 573–588, 594–601, and 607–618 only), 26, 28, 29 (pp. 679–695 only), 32 (pp. 739–740, 750–756 only), 34, 37 (pp. 837–846 only), 39, 44–45, 47, 50 and 58.
- *Managing Investment Portfolios*, (Second Edition), 1990, by Maginn, J.L., and Tuttle, D.L., Chapters 7 (exclude pp. 36–69), 8. **(Out of Print. Available as SN 6-36-04)**
- *Valuation of Interest-Sensitive Financial Instruments*, (Second Printing),1996, by Babbel, D. and Merrill, C., Chapters 1 (background only), 2–3, 5 and 8.

Study Notes

SNs for the Preliminary Education examinations and Course 6 are available on our Web site in the Education and Examination area under "Study Notes/Information." Hard copies may be purchased by using the Study Note and Published Reference order form in the back of the printed catalog or on the "Study Notes/Information" Web page.

Code	Title
6-05-05#	Course 6 Introductory Study Note
6-10-02	May 2002 Course 6 Examination
6-10-03	May 2003 Course 6 Examination
6-10-04#	May 2004 Course 6 Examination
6-20-02	Course 6 Overview
6-21-03	Defaults & Returns on High Yield Bonds: Analysis Through First Half 2002
6-23-00	GIC Portfolio Design
6-28-00	Introduction to the Formation of Investment Strategy for Life Insurance Companies and Pension Plans
6-30-00	Liquidity: The Hidden Risk Factor
6-31-00	Fiduciary Liability Issues for Selection of Investments
6-32-00	Investment Management of Retirement Plans in Canada
6-35-03	An International Survey of Stress Tests

6-36-04 Managing Investment Portfolios **(Not available on SOA Web site. Must be ordered from the SOA)**

Published References

"A Practical Guide to Interest Rate Generators for C-3 Risk Analysis," TSA XLIV
"Investment Strategy Formulation and Implementation," RSA Vol. 22, No. 3
"Management of Insurance Company Risk," RSA Vol. 23, No. 2
"Managing Risk-Based Capital," RSA Vol. 23, No. 3
"Risk-Based Capital Strategies," RSA Vol. 20, No. 4A
"Which Pension Funding Method is Right for You?", RSA Vol. 23, No. 1
"CIA Guidance Notes: An Overview of an Investment Policy Statement in an Asset/Liability Management Context," 1994
"CIA Educational Note: Measurement of Exposure to Interest Rate Risk," (including appendices), 1995

Course 7 Applied Actuarial Modeling

This course introduces the candidate to the practical considerations of modeling through an intensive seminar using a case study format. Candidates are required to pass a pre-test to be eligible to take the Course 7 seminar. The interactive approach of the seminar requires candidates to draw upon knowledge from the basic courses and to apply modeling and communication skills in a hands-on environment. The seminar also emphasizes teamwork and the synthesis of subjects in an applied setting.

Learning Objectives

The candidate must demonstrate the ability to appropriately apply the modeling process in order to support recommendations and/or facilitate business decision-making. Further, the candidate must effectively communicate the findings and/or implications of his/her model to technical and non-technical audiences. The emphasis of the course is not on specific modeling techniques but on modeling process, business problem solving, and communication. At the seminar, technical knowledge of a limited number of models and/or modeling techniques will provide the context for assessing the primary objectives.

Within the context of these overall objectives, the candidate must demonstrate knowledge and capability in the following areas:

A. The Context of Modeling

The candidate shall be able to:

1. Define a model.
2. Define an actuarial model.
3. Demonstrate a general understanding of the modeling techniques used in actuarial practice such as, but not limited to, survival models, credibility models, risk theory models, ruin theory models, option pricing models, cash flow and cash flow testing models, and nontraditional models by,
    a. Defining the general characteristics of each modeling technique.
    b. Describing the characteristics of the data, assumptions and/or input required to specify a unique model.
    c. Describing the characteristics of the output of each modeling technique.
    d. Recognizing alternative modeling techniques that may be appropriate for solving a particular business problem.
4. Explain the modeling process, including the feedback loop.
5. Recognize when a modeling approach is appropriate or inappropriate. When a modeling approach is appropriate, recognize when a simplistic approach may be sufficient.
6. Apply principles underlying models, by
    a. Defining principles common to all models.
    b. Creating models that apply the principles appropriately.
    c. Recognizing when principles have been violated and if any such violations have material effect on the solution to a business problem.
    d. Adjusting a model or the output of a model to correct for material violations of principles.
7. Identify and describe limitations of specific applications of the modeling process.
8. Identify and describe sources of error in the modeling process, including:
    a. Process error (pure risk),
    b. Statistical estimation error,
    c. Model selection error,
    d. Model versus the universe, and
    e. Assumption error, including explicit and implicit assumptions about the future environment.

B. Model Design, Selection and Set-up

The candidate shall be able to:

1. Select and apply models(s) appropriate to solving business problems.
2. Justify his/her model selection(s).
3. Calculate and explain potential errors in the model(s) selected.
4. Select and justify reasonable and appropriate assumptions to the selected underlying model(s).
5. Select and justify the parameters of any parametric model(s) selected.
6. Explain the explicit and implicit advantages and limitations of alternative models.

7. Explain how the model(s) selected was influenced by data quality and accessibility, available resources and output requirements.
8. Explain how professional and regulatory requirements affect the model(s) selected.
9. Explain explicit and implicit assumptions of the modes(s) selected.
10. Assess model usefulness using a variety of techniques including sensitivity analysis.

C. Input Data Selection and Analysis

The candidate shall be able to:

1. Assess the quality and relevance of a given data set for solving business problems.
2. Evaluate and assess the effect of data quality on the solution to a specific business problem.
3. Balance data quality, accessibility, credibility and relevance when selecting the data needed to solve a business problem.
4. Identify, if possible, alternate data sources for solving a business problem.
    a. Explain the variety, reliability and availability of data from each source.

D. Analysis of Results

The candidate shall be able to:

1. Assess the reasonableness of the results of the modeling process.
2. Measure the sensitivity of output to changes in the input, model and model parameters. Assess the effect of sensitivity on the usefulness of the results.
3. Integrate the results of several models together.
4. Draw conclusions and/or make recommendations that support business decision-making.
5. Recognize the useful life of a model, its input and its assumptions.

E. Communicating the Modeling Process

The candidate shall be able to:

1. Effectively communicate his/her conclusions, model, and limitations to technical and non-technical audiences alike. The communications shall recognize:
    a. The nature of the audience,
    b. Professional requirements (Standards of Practice),
    c. Regulatory requirements.
2. Select appropriate format and medium for his/her communications.
3. Create and maintain sufficient documentation to meet professional standards.

Pre-Test

Prior to attending the seminar, candidates must pass a pre-test on the readings outlined below. Successfully passing the pre-test assures that candidates have sufficient background on the modeling process (beyond passing the prerequisite courses) to attend and participate in an applied modeling seminar.

Candidates must attend a Course 7 seminar (from which a passing score is received) within 12 months of their successful pre-test administration. If the candidate is unsuccessful in passing the seminar within 12 months, the candidate will be required to pass another pre-test.

Administered on the first Fridays of the following months: February, April, June, August, October and December, the pre-test is a two-hour, open book test (limited to the material on the syllabus), and will consist of multiple-choice questions. After finding an FSA to supervise the administration of the pre-test, the candidate must submit a pre-test application to the SOA. The registration deadline is exactly two weeks prior to each administration of the pre-test. The pre-test is administered by the candidate's FSA supervisor in an appropriate workplace or other business location agreed upon by the candidate and supervisor.

The syllabus for the pre-test is guaranteed to be in effect for the period covered by the current catalog and for a period of at least five weeks after the release of the next catalog. The Spring catalog syllabus is in effect for the February, April and June pre-tests. The Fall catalog syllabus is in effect for the August, October and December pre-tests. If a new catalog is released after a candidate has purchased his/her study notes, the candidate is advised to check the pre-test syllabus in the new catalog for changes or additions. If new notes are listed in the most recent catalog, the candidate is responsible for obtaining those new notes through the Publication Orders department.

Pre-test Readings
Study Notes

Code	Title
7P-01-05#	Course 7P Introductory Study Note
7P-10-04	Sample Pre-Test
7P-21-00	Long Range Forecasting—From Crystal Ball to Computer (excluding pp. 373–386)
7P-22-00	Pitfalls in Human Research—Ten Pivotal Points
7P-23-00	The Modeling Process
7P-25-00	Model Uncertainty, Data Mining and Statistical Inference (excluding discussion)
7P-26-00	Applied Futurism—An Introduction for Actuaries
7P-29-00	The Strategic Uses of Value at Risk: Long-Term Capital Management for Property Casualty Insurers
7P-31-00	A Mechanic's Perspective to Model Building
7P-33-00	Actuarial Standard of Practice No. 23—Data Quality
7P-35-00	Designing Effective Graphs
7P-36-00	Report Writing: Communicating Data Analysis Results
7P-37-00	Report Writing Aids and Author's Checklist of Editorial Guidelines
7P-39-03	Actuarial Standard of Practice No. 41—Actuarial Communications, March 2002
7P-41-02	Actuarial Standard of Practice No. 38—Using Models Outside the Actuary's Area of Expertise (Property and Casualty)
7P-42-04	CIA Consolidated Standards of Practice, General Standards, May 2002, revised Sept. 2003, (Sections 1530, 1560, 1610, 1810, 1820, 1830 and 1840)
7P-43-04	Life Insurance Forecasting and Liability Models: An Examination of the Trade-offs Involved with Certain Modeling Decisions (pages 1-23 only)
7P-44-04	Data Quality: Theory and Practice
7P-45-04	Understanding Actuarial Management: The Actuarial Control Cycle, chapters 1,8,17,18

Internet Download

"Modeling Policyholder Outcomes under a Disability Income-Type Long-Term Care Insurance Policy," 2003 by Jones, B.L.

Note: The interactive notebook above is available on the SOA web site. However, before you can download and run the interactive notebook, you must purchase a copy of the CD-ROM, "Actuarial Models and Modeling: An Interactive Approach," 2000, by Jones, B.L. [ACTEX Publications] and load the CD-ROM on your computer. Once you have loaded the CD-ROM on your computer you can download the interactive notebook from SOA site at http://www.soa.org/ccm/content/exams-education-jobs/candidate-and-exam-information/course-7-pre-test-and-seminar/pre-test-syllabus-item/

The interactive notebook includes a case study with 30 exercises. The text of the interactive notebook is required reading. Completion of the exercises, while not required, is also considered a valuable tool for candidates. (Although the CD-ROM software package includes reading material, required reading is limited to the content and text of the interactive notebook. Candidates will not be tested on the content of the CD-ROM.)

Printing the Interactive Notebook for use at a Pre-test Administration
While the Interactive Notebook is not intended to be a printable document, you may print a copy of the notebook text and bring it to the administration of the Pre-test along with your study notes. Please be aware that some candidates have had difficulty printing the notebook text. When you open the interactive notebook it is generally in a window that is not full screen. Be sure to print the notebook without maximizing the window. If you still have problems printing the tables in the notebook, these can be cut and pasted fairly easily into a blank document that can be printed. These printouts may be used during the Pre-test administration.

Seminar

Enrollment for the seminars will be on a first-come, first-served basis, with priority given to those candidates who have attained ASA level. To register for a seminar, the candidate must meet the following qualifications:

- Has passed the Preliminary Education examinations and two of courses 5, 6 and 8 or has passed five of these seven courses (including the Preliminary examinations) and written the final examination for a sixth course, awaiting results. However, priority will be given to those candidates who have already passed six of the courses. Candidates who apply while awaiting May/November results will be put on an Ineligible List until grades are released, at which time registration status will be updated. Candidates will **not** be allowed to attend a seminar until successfully completing the Preliminary Education examinations and two of Courses 5, 6 and 8.*****
- Has attended and passed the pre-test within the 12 months prior to the seminar dates requested on the seminar registration form. Candidates may submit a seminar application when registering for the pre-test, however, priority will be given to those candidates who have already passed the pre-test. Candidates who apply for a seminar prior to passing the pre-test will be put on an Ineligible List until grades are released, at which time registration status will be updated. Candidates passing the pre-test at that time will be moved to registered status, space permitting. Candidates will **not** be allowed to attend a seminar until successfully completing the pre-test. (Candidates who have submitted a seminar application and who are subsequently unsuccessful on the pre-test will have their seminar registration canceled and registration fee refunded, less a $100 processing fee. These candidates will not be permitted to register for another seminar until they have registered for another pre-test.)

Note: Candidates who have submitted a seminar registration and fee prior to the registration deadline will receive the advance reading for the seminar regardless of their registration status, including those on the Wait List or Ineligible List. Candidates may only register for one seminar at a time and are not permitted to register for a future seminar while awaiting results of a previous seminar.

Ineligible List—Candidates registering for a Course 7 seminar who are not yet fully eligible to attend (i.e., have not yet passed the Preliminary Education examinations and two of Courses 5, 6 and 8, as well as the Course 7 Pre-test) will be placed on the Ineligible List.

Wait List—Fully eligible candidates registering for a Course 7 seminar that is currently at capacity for attendance will be given the choice of transferring to another seminar or remaining on the Wait List for the original seminar.

The registration deadline for the seminar is exactly four weeks prior to the first day of the desired seminar. However, a seminar may be closed prior to the deadline if registration reaches the maximum for the seminar.

The seminar includes a Common Core segment featuring case studies that illustrate various aspects of the modeling process. A second segment, the Extended Case Study segment, features the presentation and discussion of a general or practice-area-specific case study that covers all of the major components of the modeling process. The focus of this segment varies from seminar to seminar. The content of this segment of a practice area specialty seminar will focus on application(s) in a single practice area. The content of this portion of a general seminar will be designed so that no particular practice area background is significantly advantageous. During the fourth day of the seminar, candidates individually complete the project assignment (general or practice-area specific) which is the means of evaluation of the candidates' comprehension of the seminar content.

Candidates will complete advance reading for each seminar. The advance reading material will be provided on a special web site approximately 4–8 weeks prior to the seminar. Candidates will be notified of the site address via the email address supplied on their seminar application. Advance reading will include a combination of readings, data sets, and exercises specific to the seminar. In addition to providing valuable preparation for the seminar, the advance reading and assignments also allow candidates to practice needed skills and verify that their laptop computer hardware and software have the required capabilities. **Candidates who do not complete the advance reading will be at a significant disadvantage during the seminar**. It is strongly recommended that candidates complete the advance reading on the laptop they will be bringing to the seminar.

All candidates are required to bring a laptop computer to the seminar and will be responsible for the proper operation of the laptop during the seminar. The seminar facility will have outlets for plugging in the laptop. Minimum requirements and recommended configurations for the laptop are subject to change. Current requirements and configurations can be found on the Course 7 page of the SOA Web site at http://www.soa.org/ccm/content/?categoryID=825036. Printers with dedicated computers will be provided. Candidates may also bring an electronic calculator for use during the seminar.

Candidates Writing in French

Candidates planning to write their project report in French at an English speaking seminar must contact the Course 7 Coordinator in the SOA Exam department no later than two weeks prior to the exam. These candidates should also be aware that the project materials will be presented in English at an English speaking seminar. Candidates writing in French may incorporate English from the project materials into their project without penalty.

***Course 7 Prerequisite Waiver**

Experienced candidates wishing to complete the Course 7 Pre-test and Seminar prior to attaining eligibility for the Course must meet the following qualifications:

- has passed the Preliminary Education examinations and one of Courses 5, 6 or 8 and
- can demonstrate completion of at least 4 years of responsible actuarial work experience.

Requests for a Course 7 Prerequisite Waiver should be submitted in writing to the SOA Ombudsperson at the SOA office address. Please note: Candidates whose Course 7 eligibility is dependent on a waiver will be placed on the Ineligible List until registration for the seminar is closed. If at that time seats remain, Waiver candidates will be added to the list of fully registered candidates.

Notice for Unsuccessful Candidates

Recognizing that candidates who were unsuccessful in a previous Course 7 Seminar attempt may believe that they have fully mastered the content of the Common Core segment, previously unsuccessful candidates may choose to attend the seminar beginning with the Extended Case Study in the afternoon of the second day. Such candidates are, nevertheless, encouraged to attend the full seminar in order to benefit from the educational value of the entire course. The selection of Common Core cases is chosen specifically to provide the appropriate foundation for the seminar's Extended Case Study and project.

A previously unsuccessful candidate electing to attend this abbreviated version of the seminar must include a written request when submitting the seminar registration form. There is no fee reduction for attending only this portion of the seminar.

Professional Development Requirement

The Professional Development (PD) requirement of the SOA curriculum serves to cover topics that the practitioner will need to learn throughout his/her career, including those that are country-specific, regulatory, or otherwise time-sensitive in nature. While this catalog attempts to cover all major facets of the PD requirement, candidates are advised to read carefully the information provided on the PD page of the SOA web site at http://www.soa.org/ccm/content/?categoryID=833077
for more in-depth coverage of the requirement, helpful sample information, approved program lists and any updates regarding the PD process.

PD for Associateship

A candidate who uses PD as one of the components for Associateship must satisfy **all** requirements of PD. The candidate must select an advisor, submit a formal plan, obtain a minimum of 50 credits within a 25-month period (as described in section E below), submit a project demonstrating effective application of professional skills relative to a legitimate issue within the chosen practice area, and satisfy all other PD requirements. No plan may be filed until the candidate has received a passing score for the Preliminary Education examinations and one additional component (Course 5, 6, or 8). A minimum of 25 units of credit must be obtained with a passing score from a recognized examination-validated program. You may locate the examination-validated options on the PD page of the SOA web site at
http://www.soa.org/ccm/content/exams-education-jobs/candidate-and-exam-information/values/
A candidate may use unassigned conversion credits from the pre-2000 SOA education system to satisfy the requirement for 25 units of examination-validated credits.

All candidates who choose to complete PD at the Associateship level will also be required to complete a PD component prior to Fellowship. A candidate who previously used PD to meet the ASA requirements may use the credit obtained at the Associateship level through examination-validated programs, the completion of a project, and the application of unassigned conversion credits. Credit for seminars, symposia, meeting sessions, etc. (live or through distance learning) will not be carried forward and applied to the PD units required for FSA. Credit attained from conversion or from examination-validated options does not expire, with the exception of the PEC. Credit obtained through the completion of a project expires five years from the date the candidate's Associateship level PD plan was approved by the SOA.

Candidates are strongly encouraged to file their initial plan prior to working on Professional Development credits.

PD for Fellowship

All candidates for Fellowship must satisfy the PD requirements. No plan may be filed until the candidate has received a passing score for Courses 1-8. The depth of topic treatment for PD must go beyond the level covered on the Preliminary Education examinations and Courses 5-8. At least 35 units must come from the completion of suitable formal professional development programs relevant to the chosen practice area (e.g.,seminars and symposia, meeting sessions, professional examinations, and courses). The candidate must obtain a minimum of 50 units of eligible education within a 25-month period. A project demonstrating effective application of professional skills relative to a legitimate issue within the chosen practice area must be completed for 15 units of credit. Candidates are permitted to include up to 15 units of PD credit from activities occurring prior to the date the initial plan is accepted by the SOA.

Associateship & Fellowship Level

Eligible programs and projects are to be selected in accordance with SOA guidelines and the following overall educational objective approved by the Board of Governors.

Upon completion of the Professional Development (PD) requirement, the candidate will have a deeper understanding of the technical, legal, ethical, cultural, professional and practical

parameters that apply to the chosen practice area, within the geographic territory or jurisdiction of the practice of the candidate.

PD candidates will first file an initial PD plan package for SOA acceptance, followed by an executed plan package when all required elements are complete.

Process—Initial Plan

A. The candidate will identify his/her chosen practice area, territory of jurisdiction of practice, if applicable, and type of professional environment (business connection) in which the candidate plans to practice.

B. The candidate will recruit an advisor with a minimum of 5 years experience as an FSA. (Candidate may include non-FSAs in an advisory panel if head of panel is a five-year FSA.) Advisor and candidate agree to and sign the PD Letter of Commitment (form available in back of catalog). Both are subject to the SOA's Code of Professional Conduct.

C. In consultation with the advisor, educational objectives for the candidate's PD plan are identified that will address the candidate's own areas of professional interest, responsibility, long-term goals, or educational needs. Based on these objectives, the candidate may either adapt a Model Plan, or where the candidate elects to go outside the standard practice areas (or make use of programs not suitable for inclusion in a Model Plan), the candidate may develop a customized initial plan. The Model Plans are intended to be used primarily as a framework and candidates should consider tailoring the model plan objectives and topics to be covered to best fit their own PD needs.

   Whether a candidate develops a PD plan that is based on the framework of the Model Plans or develops a completely customized plan, the educational objectives articulated by the candidate should be clear and cohesive. A candidate may choose to provide a well-articulated overall educational objective or several, clearly integrated educational objectives.

   The initial plan document must include specific educational objectives, topics to be covered and an outline of the planned project. A candidate may include in the initial plan the general nature of the activities when known. Candidate and advisor then agree upon and sign the appropriate initial plan document for the candidate.

   Initial PD plans filed with the SOA will receive initial acceptance as of the date eligibility processing at the SOA office is completed. Responsibility for ensuring the quality and appropriateness of initial plans will rest directly with the candidate and advisor. The SOA will send an acknowledgement (via email when possible) that the plan has been received and confirm the initial acceptance date. When confirmation of initial acceptance is received, candidates may proceed with the additional activity required to completely execute their plans.

   The PD Committee will explicitly review initial plans only at the request of the candidate and advisor. Candidates may want to request a formal review of their initial PD plans if the proposed plan includes unique features such that the candidate is uncertain about executed plan acceptance. Candidates are advised that because their initial plans have not been reviewed and approved by the PD review groups, the review of their final executed plans may more frequently result in requests for justification or clarification of educational objectives as well as formal program elements (including the research project).

D. The candidate files an initial plan package with the SOA office, Attn: PD Committee. The package must contain the following:
   1. Initial plan document – signed by the candidate and advisor (Model or custom plan)
   2. Letter of Commitment – signed by the candidate and advisor
   3. PD filing fee and payment form (form available in the back of this catalog)

      Note: A maximum of 15 units of activity may be undertaken prior to the date of initial plan acceptance confirmation from the SOA.

E. Once the candidate has received confirmation of initial plan acceptance from the SOA, the candidate will proceed with the execution of the proposed PD plan with continued guidance and review from the advisor. The plan must be completely executed within a 25-month period. The 25-month effective period for PD begins with the earlier of the following dates:
   1. date of the earliest professional program included in the PD plan, or
   2. date of advisor's sign-off on completion of the PD project component

   The PD effective period (25-month maximum) ends with the advisor's sign-off on the completely executed PD plan.

Process—Executed Plan

The candidate and advisor take on full responsibility during the executed plan review stage. When advisor and candidate agree that all elements of the PD plan are completed, they are required to sign off on the review checklist, demonstrating that the final review was performed in accordance with the standards of the SOA. A written response to an executed plan submission will generally require 5–6 weeks.

The PD Committee will thoroughly review a sample of the PD completion reports submitted. An administrative review for eligibility and adherence to limits and requirements will be conducted on all final PD reports submitted. Any concerns flagged during the administrative review will also merit a plan submission through the formal content review process.

Executed plan package must include the following:

A. Statement attesting to the plan's completion—signed by the advisor and candidate.
B. Executed PD Plan Review Checklist—signed by the advisor and candidate. (Checklist available in the back of this catalog.)
C. A brief report describing the overall educational benefits obtained and discussing any modifications to the original plan.
D. A program summary for each program/session that describes how that program helped to attain the educational objectives of the plan and what the candidate learned from the program that may benefit the candidate's current or future practice. The summary must be more than a list of the topics covered at the session.

   Note: Given the examination-validated format of the CIA's Practice Education Course and the AAA's Seminar on Life and Health Qualifications, candidates making use of these courses need not provide individual summaries for these programs.
E. Copy of the project report.
F. For non-approved programs, supporting documents obtained through program attendance (e.g., programs, handouts).

PD Document Submission—Additional Guidelines

A. All PD plan documents should be submitted to the PD Committee at the following address:

Professional Development Committee
Society of Actuaries
475 N. Martingale Road, Suite 600
Schaumburg, IL 60173-2226

B. Please allow 5–6 weeks for a response to your executed plan submission.
C. Do <u>not</u> use company letterhead when submitting plan documents.
D. Avoid binding plan documents, as the materials will need to be copied for review by the PD Committee. (Staples, clips or rubber bands are acceptable.)
E. Include a cover memo stating the intent of the package (initial plan, executed plan, follow-up to previously submitted plan etc.)
F. Include your PD filing fee and payment form when submitting your initial plan

   Note: *If it is necessary to submit your PD filing fee and payment form separate from your PD plan documents, please send the payment to the address specified on the payment form for check or*

credit card payments. If submitting payment form along with plan documents, please send to the SOA office address, not the P.O. Box listed on the payment form.

Electronic Plan Submissions

PD plans may be submitted electronically to pdcomments@soa.org. When adhering to the following guidelines, electronic submission of the plan facilitates the review/approval process.

1. Initial Plan Package—Only the PD plan document need be submitted electronically. The *original* signed PD plan document along with hard copies of the letter of commitment and PD filing fee payment form must still be submitted to the PD Committee at the SOA office via mail or other courier at the same time as the electronic submission.
2. Executed Plan Package—The executed plan documents may be submitted electronically. The *original* signed documents along with any necessary handouts or supporting documents not in electronic form must be submitted to the PD Committee at the SOA office via mail or other courier at the same time as the electronic submission.

Electronic Document Guidelines

1. Word, EXCEL, PowerPoint or PDF documents only
2. One document submissions only—If information is currently stored in more than one file, it is necessary to combine those files into one document prior to submission
3. Include cover letter information at the front of the document, not in the message portion of the email. Include the names of you and your advisor only once at the beginning of the document. Employer information should not be included in this document.

Plan Components—Minimum 50 units required

A. Formal Professional Program Component = 35 units minimum

1. SOA-approved Programs = 20 units minimum
   All SOA-approved programs and meeting sessions are listed on the PD page of the SOA Web site. Program sponsors requesting formal program approval may submit information to the SOA office, Attn: Jacquenette Moody in the Continuing Education Department, or electronically to jmoody@soa.org. A sixty-minute hour will generally be awarded 1 unit. Typically, an SOA-approved seminar will be given a maximum of 6 units per day, with a limit of 15 units for any one program, regardless of length. The following types of programs will in most cases be SOA-approved:

   a. SOA, CAS, CIA, CCA, ASPA or AAA programs (and other recognized actuarial organizations)
      - seminars
      - symposia
      - appropriate meeting sessions

   b. Evaluation-validated programs (with passing score)—Values for many examination-validated options are listed on the PD page of the SOA Web site. Credits earned from examination-validated options or conversion do not count towards the 15 maximum credits allowed prior to filing an Initial PD plan.
      - Conversion credit from pre-2000 SOA education system—Credits are first applied to the project component, then to the SOA-approved program requirement and finally to any remaining units needed. However, a candidate with 15 or more units of conversion credit may elect to complete a project if desired.
        Note: Candidates completing PD for ASA level credit must have a minimum of 25 units of examination-validated credit plus 15 units of conversion credit from the pre-2000 system to be exempt from completing the project component.
      - Ph.D. dissertations or research papers published in refereed journals may also be eligible for credit if relevant.

   c. Programs or examinations required for PD by JBEA, AAA or CIA

Note: In special circumstances, such as when the candidate is active in an emerging practice area, relevant programs outside these categories (e.g., graduate level courses) may receive SOA-approved status.

Non-approved Programs = 15 Units maximum

The non-approved category includes educational programs that the candidate and advisor believe are consistent with the educational objectives of the candidate's plan. Nonactuarial seminars, professional meetings and graduate level courses are among the programs suitable for inclusion. Non-approved programs are valued at a maximum of 5 units per full day program and 10 units maximum for any one program, regardless of length.

Program presenters may be awarded credit at a rate of 3 units for 1 hour of presentation. If the program is classified as SOA-approved, the presenter will receive SOA-approved units. If the program is not SOA-approved, the presenter will receive non-approved units for appropriate programs.

Candidates are permitted to make use of distance learning option up to a maximum of 15 units per plan (either SOA-approved or non-approved). Distance learning options may include activities such as professionally audiotaped or videotaped programs, Internet programs, CD-ROM products or other distance media. However, distance learning options are limited to those sponsored by the SOA or other recognized actuarial organizations (e.g., CAS, CIA, CCA, ASPA, AAA). If you have questions regarding the types of distance learning that may be appropriate for PD, please contact pdcomments@soa.org for clarification.

Please note: In the case of previously presented programs (e.g., audio or videotaped sessions or rebroadcasts of earlier live internet sessions), the date of the actual program will serve as the effective date for a candidate's PD plan, not the date a candidate listens to a tape or views a recorded program. The effective date is used for determining if the credit is to be included in the 15-unit limit prior to initial acceptance. The effective date must also fall within the candidate's 25-month timeframe; no credit will be granted for distance learning elements outside of that window.

All programs, regardless of approval status, must be consistent with the educational objectives of the candidate's PD plan for credit to be received.

B. Project Component = 15 units (60–100 hours expected for completion)

The candidate defines a project that addresses an issue of relevance to his/her chosen practice area and that relates to the candidate's stated educational objectives. The candidate discusses the project with his/her advisor and then undertakes the necessary research and investigation including most or all of the following steps:

1. Identification of the practical situation or issue requiring research and analysis
2. Review of appropriate literature
3. Collection of data
4. Analysis of data and literature
5. Development and articulation of conclusions and recommendations reached from the research and analysis
6. Oral communication of the project's purpose, scope, results and conclusion to the advisor and other relevant parties
7. Written report

The project represents a significant work effort. It may be associated with work done in conjunction with the candidate's employment but must include additional independent research and relate to the educational objectives of the candidate's PD plan.

The PD Committee anticipates that the project will require a commitment of 60–100 hours by the candidate. The candidate will communicate the essential aspects of the project, orally for peer review and comment.

A written report on the project must be submitted to the SOA for review. Where the project contains information of a proprietary or sensitive nature, the candidate is not required to submit a full report; however, the candidate must provide a summary sufficient to allow assessment that the project has contributed satisfactorily to meeting the candidate's educational objectives. Candidates will not be required to submit a full project outline with the initial plan submission. However, the PD Committee will need to be able to clearly identify the project steps in the candidate's written project report submitted with the executed plan.

Please review the additional information on the PD requirement (including all related documents) on the PD page of the SOA Web site at http://www.soa.org/ccm/content/?categoryID=833077

Associateship Professionalism Course (APC)

The Associateship Professionalism Course (APC) is part of the requirements for the Associate (ASA) designation. The Associateship Professionalism Course is one-half day in length. The course covers professionalism, ethics and legal liability and makes extensive use of the case study method. Candidates are eligible to register for the APC upon completing the preliminary education requirements and passing one additional component from among Courses 5-8.

The SOA Board of Governors has approved the Canadian Institute of Actuaries' (CIA) Professionalism Course as a substitute for the APC. Therefore, Canadian candidates who attend the CIA course are not required to take the SOA course. The CIA provides our Registrar with passing candidate data.

For course dates and registration information, please see our Web site at www.soa.org under Education and Jobs or contact apc@soa.org or call 847-706-3561.

Fellowship Admissions Course (FAC)

The final requirement to attain the FSA designation, after all other educational requirements have been completed, is the Fellowship Admissions Course (FAC). The FAC can be taken any time after all other requirements have been completed.

As actuaries assume responsible positions within organizations, they need special skills and knowledge to carry out their new roles effectively.

The FAC is designed to help actuaries deal effectively with the issues and situations they may confront as they progress in their organizations. It has two purposes:

1) to increase awareness of professional ethical issues and identify strategies to address them, and

2) to encourage actuaries to approach problem solving from varied directions/perspectives.

In order to accomplish these objectives, the FAC has been designed to provide the actuary with opportunities to explore these issues over a 2-day period **primarily through the case study method** and to enhance the skills needed to be effective in these situations.

Registration information will be sent to candidates after their final executed PD plan has been approved by the SOA PD committee. It is recommended that your PD Plan be submitted at least 5–6 weeks before the FAC registration deadline. Candidates who earn eligibility upon successful completion of an SOA examination, including the Course 7 seminar, are eligible to register upon receipt of a passing score. If you are completing your requirements for the FSA designation with a component other than PD, please contact fac@soa.org.

Registrations will be accepted up to 45 days prior to the start of a given FAC session, **space permitting**. Candidates are strongly encouraged to register for the FAC session immediately upon receiving final approval of their PD Plan or upon completing their exam requirements if they are not using PD as a final step.

For upcoming dates, please see our Web site at www.soa.org under Education and Jobs. Questions on the FAC may be directed to fac@soa.org or 847-706-3561.

Enrolled Actuaries Examinations

The Enrolled Actuaries examinations are co-administered by the SOA, ASPA, and the Joint Board for the Enrollment of Actuaries.

The official description of the EA examinations is contained in the *Examination Program*, available from the Joint Board for the Enrollment of Actuaries. It is also available on the SOA Web site at http://www.soa.org/ccm/content/?categoryID=846033.
A copy of this announcement will be sent to each candidate who registers for the examination at the same time as the candidate's Ticket of Admission.

Candidates should note that the EA examination questions do not require the mastery of specified study materials or specified chapters of any particular textbooks. Moreover, a specified topic may not be fully covered in every suggested reference. Examination questions may even deal with practical situations not necessarily covered in any published material.

The study material below was listed in the *July 2004 Examination Program*. The Advisory Committee on Actuarial Examinations believes that most (if not all) of the topics in the syllabus are treated in one or more of these references. The *January 2005 Examination Program* will have the official description of the Spring 2005 Enrollment examinations.

The SOA provides some study material for EA candidates. While the E&E Committee believes that these references are useful to EA candidates, the materials were not necessarily written with the particular nature of the Joint Board examinations in mind. The SOA SNs are listed separately from the Joint Board's suggested readings.

Note: The course of reading for this course may include commutation functions that are not included in the Second Edition of *Actuarial Mathematics*. Candidates who want a summary of commutation functions and their use can order Study Note 600-99-99, Commutation Functions, from the SOA.

The following list of topics and suggested readings is from the Joint Board's *July 2004 Examination Program* Booklet.

EA-1 Basic (EA-1) Examination

The EA-1 examination is 2½ hours in length and covers (1) the mathematics of compound interest and practical financial analysis and (2) the mathematics of life contingencies and practical demographic analysis.

The Joint Board will grant a waiver of the EA-1, examination to any candidate who has received credit from the SOA for Courses 2 and 3 of the SOA's examination program.

A. Mathematics of compound interest and financial analysis (approximately 25%–50% of the examination)

1. nominal and effective rates of interest and discount, force of interest, accumulated value factors, and present value factors,
2. all forms of annuities including, but not limited to annuities certain, increasing and decreasing annuities, annuities in which the payment frequency is not the same as the frequency at which interest is compounded, and perpetuities,
3. amortization schedules and sinking funds, including the determination of outstanding principal, the split of payments into principal and interest, and the determination of required periodic payments,
4. bonds and related securities, including bond price formulas, bond accounting, the split of periodic payments into amortization and interest, mortgages, and variable interest securities,
5. determination of fund yield rates and effective rates of return using time-weighted and dollar weighted methods,
6. duration and immunization of cash flows,
7. asset reporting: including realized and unrealized gains/losses, book value versus market value, and receivables,
8. financial analysis, including inflation and its role, elements of risk and uncertainty, yield curves and available investments, and employee compensation increases,

B. Mathematics of life contingencies and demographic analysis (approximately 50%–75% of the examination)

1. measurements and demographic analysis of mortality, including the definition and application of standard mortality probability symbols and force of mortality,
2. approximation of fractional period mortality and survival probability,
3. measurement and demographic analysis of disability, employee turnover and employee retirement,
4. adjustments to mortality, disability, turnover and retirement rate tables, such as age setbacks and set forwards, select and ultimate tables, projection scales and generation adjustments,
5. life annuities, including life annuities with a term certain,
6. population theory, including complete and curtate expectation of life, central death rates, stationary population, and average ages in a stationary population,
7. multiple life functions, probabilities and annuities,
8. multiple decrement functions, including associated single decrement tables, probabilities of decrement and the construction of multiple decrement tables from associated single decrement tables,
9. principles of actuarial equivalence and related calculations,
10. one-year term costs for ancillary benefits,
11. life insurance, including basic forms, single and annual premiums, varying insurance, and insurance and annuity relationships.

Suggested Readings (selected by the Joint Board):

The Advisory Committee on Actuarial Examinations believes that most (if not all) of the topics in the syllabus are covered in one or more of the following sources. There is a great deal of overlap among the following references. Candidates do not need to use them all. The references listed below are to identify available resources from which the candidate may select. This list is not meant to describe or modify the syllabus listed above.

Texts

- *Actuarial Mathematics*, (Second Edition), 1997, by Bowers, N.L., Jr., Gerber, H.U., Hickman, J.C., Jones, D.A. and Nesbitt C.J., (excluding Chapters 1–2, 12–15). First Edition (1986) may also be used (excluding Chapters 1–2, 11–13.)
- *A Guide for the Actuarial Student: Life Contingencies and Ruin Theory*, 1999, by Batten, R.W. and London, R.L. **(This is *strictly* a supplement to *Actuarial Mathematics* and would be found to be of little value in the absence of a prior, detailed study of that text.)**
- *Introduction to Mathematics of Demography*, (Third Edition), 1997, by Brown, R.L., Chapters 3 and 5.
- *Life Contingencies*, (Second Edition), 1967, by Jordan, C.W.
- *Mathematics of Finance,* (Fifth Edition), 2001, by Zima, P. and Brown, R.L.
- *Mathematics of Investment and Credit,* (Third Edition), 2005, by Broverman, S.A.
- *Survival Models and Their Estimation*, (Third Edition), 1997, by London, D., Chapters 3–8.
- *The Theory of Interest*, (Second Edition), 1991, by Kellison, S.G.
- *The Theory of Interest and Life Contingencies with Pension Applications: A Problem-Solving Approach*, (Third Edition) 1999, by Parmenter, M.M.

Additional Readings

- Actuarial Standards of Practice, No. 27, “Selection of Economic Assumptions for Measuring Pension Obligations”
- Actuarial Standards of Practice, No. 35, “Selection of Demographic and other Noneconomic Assumptions for Measuring Pension Obligations”

Study Notes (selected by the SOA)

Code	**Title**
EA1-05-05#	Introductory Study Note
EA1-10-02	May 2002 EA-1 Examination
EA1-10-03	May 2003 EA-1 Examination

EA1-10-04# May 2004 EA-1 Examination
EA1-24-91 Actuarially Equivalent Benefits
EA1-61-91 Measurement of Investment Return

Commutation Functions Study Note (600-99-99) can be purchased separately on the study note order form. In addition, it is suggested that candidates contact ASPA for their recommended readings and any study materials they may be offering.

EA-2, B Pension (EA-2, Segment B) Examination

The EA-2, Segment B examination is 2½ hours in length and covers relevant pension laws (in particular the provisions of the Employee Retirement Income Security Act (ERISA) and related laws, regulations, and rulings) as they affect pension actuarial practice. The EA-2, Segment B examination presupposes knowledge of the topics covered in EA-2, Segment A and in the EA-1 examination.

Syllabus

1. requirements with respect to reporting and disclosure, including underfunded plans, reductions in future benefit accruals, and reportable events,
2. non-discrimination requirements including those related to plan participation, coverage, and permitted disparity,
3. requirements with respect to vesting, service credits, employee contributions, accrued benefits, normal retirement, early retirement, postponed retirement, joint and survivor annuities, and preretirement death benefits,
4. maximum benefit limitations and the effect on the funding standard account,
5. additional requirements with respect to top-heavy plans and the effect on the funding standard account,
6. requirements with respect to mergers and spin-offs, including those in the Internal Revenue Code, Title IV of ERISA, and the effect on the funding standard account,
7. PBGC premium requirements,
8. plan termination requirements including standard and distress terminations, involuntary terminations, missing participants, guaranteed benefits, allocation of assets, plan liability and employer liability,
9. withdrawal liability under multiemployer plans,
10. excise taxes other than for funding requirements,
11. prohibited transactions and fiduciary standards,
12. standards of performance and professional conduct for enrolled actuaries.

For purposes of this examination, the “sunset” provisions of the Economic Growth and Tax Relief Reconciliation Act (EGTRRA) should be ignored.

For purposes of this examination, IRS, Treasury and PBGC releases granting disaster relief should be ignored.

Suggested Readings

Pension law and IRS promulgations can be found in publications of Warren, Gorham & Lamont, Commerce Clearing House, Maxwell Macmillan, Research Institute of America, and similar organizations. This list is not meant to describe or modify the syllabus listed above.

Employee Retirement Income Security Act of 1974 (ERISA), as amended through December 31, 2004

Internal Revenue Code sections, all as amended through December 31, 2004:

318 Constructive Ownership of Stock
401 Qualified Plans–definition excluding subsections (f), (g), (i), (m), (n), and (o)
410 Minimum Participation Standards excluding subsections (c) and (d)
411 Minimum Vesting Standards excluding subsection (e)
413 Collectively Bargained Plans, etc.

414	Definitions and Special Rules–Controlled Group, Multiemployer, Mergers, HCE, SLOB, Compensation excluding subsections (d), (e), (o), (t), and (u)
415	Limitations on Benefits & Contributions excluding subsections (m) and (n)
416	Top Heavy Rules
417	Minimum Survivor Annuity Requirements
420	Transfers of Excess Pension Assets to Retiree Health Accounts
1563	Definitions and Special Rules
4974	Excise Tax on Certain Accumulations in Qualified Retirement Plans
4975	Tax on Prohibited Transactions
4980	Tax on Reversion of Qualified Plan Assets to Employer
4980F	Failure of Applicable Plans Reducing Benefit Accruals to Satisfy Notice Requirements
6057	Annual Registration
6058	Information Required in Connection with Certain Plans of Deferred Compensation
6059	Periodic Report of Actuary

Joint Board Regulations (20 CFR Part 901.20) governing the performance of actuarial services under ERISA
Treasury Department Circular No. 230 (31 CFR Part 10) Section 10.3

IRS Promulgations:

Regulations:

1.401(a)(4)	Nondiscrimination Requirements
1.401(a)(17)	Limitation on Annual Compensation
1.401(a)(26)	Minimum Participation Requirements
1.401(1)	Permitted Disparity
1.410(b)	Minimum Coverage Requirements
1.411(d)-4	Section 411(d)(6) Protected Benefits
1.414(1)	Mergers and Consolidations of Plans or Transfers of Plan Assets
1.414(q)-1T	Highly Compensated Employees
1.414(s)	Definition of Compensation
1.415	General Rules with Respect to Limitations on Benefits and Compensations under Qualified Plans
1.416-1	Questions and Answers to Top-Heavy Plans
1.417(a)(3)-1	Disclosure on Relative Values of Optional Forms of Benefit
1.417(e)-1	Restrictions and Valuations of Distributions from Plans Subject to Sections 401(a)(11) and 417
54.2980F	Final Regulations Implementing Section 569 of EGTRRA
301.6057-1	Employee Retirement Benefit Plans; Identification of Participant with Deferred Vested Retirement Benefit
301.6057-2	Employee Retirement Benefit Plans; Notification of Change in Plan Status
301.6058-1	Information Required in Connection with Certain Plans of Deferred Compensation
301.6059-1	Periodic Report of the Actuary

Revenue Rulings

81-11	Minimum accrued benefits; fractional rule; break-in service
81-140	Suspension of Benefits Due to Reemployment
81-195	Effect of 415 Limits on Minimum and Maximum Contribution Levels, and Inability to Project Future Increases in Limits for Funding Purposes
81-212	Funding Standard Account, with Spin-off (See Revenue Ruling 86-47)
81-215	Effect of 415 Limits after Valuation Date but within Plan Year
85-131	Reasonable Allocation of Past and Future Liabilities under Unit Credit Method with 415 Limit is Involved
86-47	(Sequel to Revenue Ruling 81-212)
86-48	Determining “Benefits on a Termination Basis” for the Purpose of a Spinoff (i.e. early retirement benefits, optional forms, …)
89-60	Interest Rates used in Determining Employees’ “Accumulated Contributions”

89-87	Terminated Plans must Distribute as soon as Administratively Feasible after Plan Termination
92-66	Must an early retirement window benefit be provided permanently to all employees under a plan where the employer amends its plan to make the benefit available for substantially consecutive, limited periods of time?
98-1	Limitations on benefits and contributions, as amended by the Uruguay Round Agreement Act, and taking into account the applicable provisions of the Small Business Job Protection Act of 1996
2001-51	Limitations on benefits and contributions under qualified Plans
2001-62	Mortality Tables Prescribed under Section 415(b)(2)(E)(v) and the Applicable Mortality Table under Section 417(e)(3)(A)(ii)(I)
2002-42	Partial Termination Merger or Conversion of Money Purchase Plan: IRC §4980F Notice and 204(h) or ERISA
2002-43	General rules relating to excise tax on prohibited transactions
2003-65	Vesting Service Upon Resumption of Accruals
2003-85	Application of IRC Section 4980 Excise Tax
2004-65 #	Election of Enhanced Pension Benefit Under IRC Section 420

Notices

83-10	Questions and Answers Relating to the Amendment of the Limitations on Benefits and Contributions by the TEFRA of 1982
87-20	Temporary Guidance on Interest Rate Used in Calculating Defined-Benefit Plan Present Value and Benefits
87-21	Guidance with Respect to the Effect of Certain Provisions TRA ‘86 Dealing Principally with the new Limitations on Contributions and Benefits under Code Section 415
88-25	No year of service (including years of service before the effective date of the OBRA 1986 provisions) may be disregarded because of the attainment of any age in determining benefits payable to employees from certain employee benefit plans
88-126	Regulation on Continued Benefit Accruals will Depart from EEOCs; Pre-1988 Service May Not Be Ignored Because of Age
97-75	Guidance relating to the amendments to the minimum distribution requirements of section 401(a)(9) of the Code made by section 1404 of the Small Business Job Protection Act of 1996, Pub. L. 104-188
99-44	Section 415 Limitation on Benefits and Contributions Under Qualified Plans
2001-56	Effective Dates for Certain Amendments made by EGTRRA

PBGC Promulgations:

Regulations:

4001	General and Definitions
4006	Computing Premiums
4007	Paying Premiums
4010	Notification to PBGC
4011	Participant Notices
4022	Guaranteed Benefits
4041	Terminations
4043	Reportable Events
4044	Allocation of Assets
4050	Missing Participants
4062	Termination Liability for Sponsor
4211	Multiemployer Plan Withdrawal Liability
4219	Multiemployer Plan Withdrawal Liability

PBGC Technical Updates:

96-3	Annual Financial and Actuarial Information Reporting

97-6	Waiver for Small Employer Reporting of Missed Quarterly Contributions
00-4	2000 PBGC's Full Funding Limit Exemption from the Variable Rate Premium
00-7	Increased Guarantee Limit for Multiemployer Plans

Study Notes (selected by the SOA)

Code	**Title**
E2B-05-05#	Introductory Study Note
E2B-10-02	May 2002 EA-2, Segment B Examination
E2B-10-03	May 2003 EA-2, Segment B Examination
E2B-10-04#	May 2004 EA-2, Segment B Examination
E2B-24-96	Pension Plan Terminations
E2B-44-99	Update to E2B-24-96
E2B-46-92	Contributory Pension Plans after OBRA '89
E2B-49-04	Penalty Taxes Under the U.S. IRC
E2B-53-05#	Reportable Events and Form 200 Requirements
E2B-56-02	Summary of Economic Growth and Tax Relief Reconciliation Act of 2001 (EGTRRA) Provisions Relating to Pension and Profit-Sharing Plans

Commutation Functions Study Note (600-99-99) can be purchased separately on the study note order form. In addition, it is suggested that candidates contact ASPA for their recommended readings and any study materials they may be offering.

2005 COURSE SUMMARIES

PRELIMINARY EDUCATION COMPONENT (P, FM, M, C)

Exam P Probability

This exam develops the candidate's knowledge of the fundamental probability tools for quantitatively assessing risk. The application of these tools to problems encountered in actuarial science is emphasized. A thorough command of probability topics and the supporting calculus is assumed. Additionally, very basic knowledge of insurance and risk management is assumed.

Exam FM Financial Mathematics

The goal of the Financial Mathematics exam is to provide an understanding of the fundamental concepts of financial mathematics, and how those concepts are applied in calculating present and accumulated values for various streams of cash flows as a basis for future use in: reserving, valuation, pricing, duration calculation, asset/liability management, investment income, capital budgeting and valuing contingent cash flows.

Exam M Actuarial Models

This course develops the candidate's knowledge of the theoretical basis of actuarial models and the application of those models to insurance and other financial risks. A thorough knowledge of calculus, probability and interest theory is assumed. Knowledge of risk management at the level of Course P is also assumed.

The candidate will be required to understand, in an actuarial context, what is meant by the word "model," how and why models are used, their advantages and their limitations. The candidate will be expected to understand what important results can be obtained from these models for the purpose of making business decisions, and what approaches can be used to determine these results.

Exam C Construction and Evaluation of Actuarial Models

This exam provides an introduction to modeling and covers important actuarial methods that are useful in modeling. A thorough knowledge of calculus, probability and mathematical statistics is assumed.

The candidate will be required to understand the steps involved in the modeling process and how to carry out these steps in solving business problems. The candidate should be able to: 1) analyze data from an application in a business context, 2) determine a suitable model including parameter values, and 3) provide measures of confidence for decisions based upon the model. The candidate will be introduced to a variety of tools for the calibration and evaluation of the models covered in Exam C.

Course 5 Application of Basic Actuarial Principles (Offered in Fall Only)

This course develops the candidate's knowledge of basic actuarial principles applicable to a variety of financial security systems: life, health, property & casualty insurance, annuities, and retirement systems. The candidate will be required to understand the purpose of these systems, the design and development of financial security products, the concepts of anti-selection and risk classification factors, and the effects of regulation and taxation on these issues. The course will develop the candidate's knowledge of principles and practices applicable to the determination of premiums and rates and the valuation and funding of these financial security systems.

Course 6 Finance and Investments (Offered in Spring Only)

This course extends the candidate's knowledge of basic actuarial principles in the fields of investments and asset management. Candidates completing this course will have developed some expertise in the areas of capital markets, investment vehicles, derivatives-applications, principles of portfolio management and asset-liability management.

Course 7 Applied Actuarial Modeling

This course introduces the candidate to the practical considerations of modeling through an intensive seminar using a case study format. Candidates are required to pass a pre-test and all other course prerequisites as stated in the Course of Reading and Description of Spring 2005 Examinations. The interactive approach of the seminar requires candidates to draw upon knowledge from the basic courses and apply modeling and communication skills in a hands-on environment. The course also emphasizes teamwork and the synthesis of subjects in an applied setting.

All seminars consist of a common core segment during which the instructor involves the attendees in several case studies and works with candidates to address various aspects of the modeling process. An Extended Case Study segment features presentation and discussion of a general or practice-area-specific case study that covers all of the major components of the modeling process. This segment varies from seminar to seminar. The content of this segment of a practice-area-specific seminar focuses on application(s) in a single practice area. The content of this portion of a general seminar is designed so no particular practice area background is significantly advantageous. During the fourth day of the seminar, candidates individually complete the project assignment, (general or practice-area specific) which is the means of evaluation of the candidates' comprehension of the seminar content.

Course 8 Advanced Specialized Actuarial Practice (Offered in Fall Only)
Finance and Enterprise Risk Management

This course consists of a core component and two extensions, Finance and Enterprise Risk Management (ERM). The material for the core component will be common to every candidate sitting for this examination. However, each candidate will select only one of the two extensions for individual study.

This course trains candidates in the financial aspects of operating and evaluating a financial institution. This includes gaining an understanding of several subjects, including accounting, corporate finance, capital markets, strategic planning, financial analysis, modeling risk and managing risk.

Course 8 Advanced Specialized Actuarial Practice (Offered in Fall Only)
Health, Group Life, and Managed Care

This course consists of a core component and two extensions. The material for the core component will be common to every candidate sitting for this examination. However, each candidate will select only one of the two extensions for individual study.

Both the core component and the two extensions address actuarial principles within the context of plan design, data analysis and rating, and financial management. The core component also addresses issues related to administrative and delivery systems. The common elements of these general principles will be addressed in the core component of the examination as they relate to group life, both individual and group coverages of disability income, dental, medical and long-term care insurance, and the financing and delivery of medical and dental services provided in a managed care environment.

The course extension on Health and Group Life ("Group Extension") provides a more in-depth treatment of the application of these actuarial principles to group life and both individual and group disability income, dental, medical and long-term care insurance products.

The course extension on Managed Care ("Managed Care Extension") provides a more in-depth treatment of the application of actuarial principles to both the medical and dental managed care product environments. This course extension focuses primarily on the managed care delivery systems as currently implemented in the United States.

Course 8 Advanced Specialized Actuarial Practice (Offered in Fall Only)
Individual Insurance

This course covers advanced topics on individual life, annuity, and reinsurance coverages. The topics address the following areas relating to individual life and annuity products: 1) marketing; 2) actuarial principles and practices used in pricing; 3) valuation and financial statements; and 4) product development and pricing.

Course 8 Advanced Specialized Actuarial Practice (Offered in Fall Only)
Investments

This course pursues advanced topics in investment and asset management with a concentration on the application of asset-liability management techniques. Candidates completing this course will have enhanced their expertise in the areas of portfolio management theory and application, option pricing theory, and asset-liability management.

Course 8 Advanced Specialized Actuarial Practice (Offered in Fall Only)
Retirement Benefits

This course exposes candidates to all types of retirement plans from both the perspective of a consulting actuary and that of an actuary working in a financial organization offering retirement products and services. Topics covered include design of retirement programs, valuation considerations, the regulatory environment, pension funding vehicles, financial reporting of retirement programs, and professional standards.

The course will be administered in two segments: 1) Pension Funding Mathematics; and 2) Comprehensive Segment. Each of these segments is independent and may be taken in different years. However, the Comprehensive Segment will presume knowledge of the topics covered in the Pension Funding Mathematics Segment. Candidates with credit for the Enrolled Actuaries' examination EA-2, Segment A (EA-1, Segment B before 1/1/01), will automatically receive credit for the Course 8 Retirement Benefits Pension Funding Mathematics Segment and may not receive credit for both.

Enrolled Actuaries Examinations

EA-1 Offered in Spring Only

The EA-1 examination covers (1) the mathematics of compound interest and practical financial analysis, and (2) the mathematics of life contingencies and practical demographic analysis. It is a 2½ hour multiple-choice examination.

EA-2, Segment A Offered in Fall Only

Segment A of the EA-2 examination covers the selection of actuarial assumptions and the calculation of minimum required and maximum tax-deductible contributions under current pension law, along with the related actuarial mathematics. Segment A of the EA-2 examination presupposes knowledge of the topics covered in the EA-1 examination. The examination is a four hour multiple-choice examination.

EA-2, Segment B Offered in Spring Only

Segment B of the EA-2 examination covers relevant pension laws, in particular the provisions of the Employee Retirement Income Security Act and related laws, regulations, and rulings as they affect pension actuarial practice. Segment B presupposes knowledge of the topics covered in Segment A and in the EA-1 examination. The examination is a 2½ hour multiple-choice examination.

CONVERSION MAPPING

The following table outlines the conversion mapping and additional rules for the implementation of the new education system. Exams P, FM, M and C will be offered for the first time in the spring of 2005. The Fundamentals of Actuarial Practice (FAP) modules and exams will be offered starting in 2006 followed by the implementation of the FSA level components (examinations and modules) in 2007. Candidates who have exam credit dating prior to 2000 and who are interested in receiving information on prior conversions should contact Brett Rogers, the SOA Registrar at brogers@soa.org.

CANDIDATES WITH CREDIT FOR CURRENT COURSE	WILL RECEIVE CREDIT FOR NEW REQUIREMENTS//EXAMINATIONS/MODULES
1	Exam P, Probability
2	Exam FM, Financial Mathematics
3	Exam M, Actuarial Models
4	Exam C, Construction and Evaluation of Actuarial Models
5	FAP Modules 1 through 5 and first FAP exam
6	FSA Modules, excluding capstone module
7	FAP Modules 6 through 8, second FAP exam, and FSA capstone module
Either 8 or PD, but not both	Exam DP, Design & Pricing, from the same practice area as the Course 8 or stated in the PD plan
8 and PD	Exam DP, Design & Pricing and Exam CSP, Company/Sponsor Perspective from the same practice area as the Course 8
APC	APC

Additional rules and considerations:

- Credits earned prior to 2000 will first be converted to the current system before applying this conversion map to determine credits under the new system.
- All candidates with the ASA designation will retain that designation. However, in order to obtain an FSA, the candidate will need to have credit for all of the educational requirements including all portions of the new FAP Course.
- Candidates will be able to earn an ASA using the current courses and ASA rules through 2006. The APC may be taken at any time following completion of the prerequisite courses. The FAP Modules, FAP Exams, new FSA Exams and FSA Modules may not be used to satisfy any part of the current ASA requirements.
- Credit for the FSA capstone module does not give credit for the FAC.
- Depending on his or her individual record, a candidate who is not an ASA may earn credit for certain FSA Exams or Modules through conversion. However, all of the ASA requirements must be met in order to achieve the ASA designation.
- Effective January 1, 2006, if a candidate has PD credits because of the 2000 conversion, they may file and execute their PD plan ahead of meeting the normal filing requirements.
- Unused PD credits earned from passing the pre-2000 Course 120 (Applied Statistical Methods) will be used for the validation of Applied Statistics. These PD credits may not be used to satisfy any other requirements.
- Successful completion of EA-2, Segment A and/or EA-2, Segment B will give the candidate credit for specified portion(s) of the FSA component for the U.S. Pension track.

TEXTBOOKS INCLUDED IN THE COURSE OF READING—Spring 2005

Candidates should order texts as early as possible to avoid being affected by possible delays. Any candidate who experiences a significant delay in obtaining a book from the publisher should contact the SOA office immediately.

For texts available from the SOA, see the order form in the back of this Catalog.

Course(s)	Author(s)	Title
P	Bean, M.A.	*Probability: The Science of Uncertainty with Application to Investments, Insurance and Engineering,* 2001, Brooks/Cole Publishing Company, a division of Thomson Learning.
P #	Ghahramani, S.	*Fundamentals of Probability with Stochastic Processes,* (Third Edition), 2005, Prentice-Hall.
P	Hassett, M., Stewart, D.	*Probability for Risk Management*, 1999, ACTEX Publications.
P #	Mendenhall III, W. Scheaffer, R. Wackerly, W.	*Mathematical Statistics with Applications* (Sixth Edition), 2002, Duxbury Press. Order from Thomson Learning or book distributors.
P #	Miller, I Miller, M	*John E. Freund's Mathematical Statistics with Applications* (Seventh Edition), 2004, Prentice Hall.
P	Ross, S.M.	*A First Course in Probability* (Sixth Edition), 2001, Prentice-Hall.
FM, EA-1 #	Broverman, S.A.	*Mathematics of Investment and Credit* (Third Edition),2004, ACTEX Publications
FM, EA-1	Kellison, S.G.	*The Theory of Interest* (Second Edition), 1991, Irwin/McGraw-Hill.
M, EA-1	Bowers, N.L., Gerber, H.U., Jones, D.A., Hickman, J.C., Nesbitt, C.J.	*Actuarial Mathematics* (Second Edition), 1997, SOA.
M	Ross, S.M.	*Introduction to Probability Models* (Eighth Edition), 2003, Harcourt/Academic Press. Order from Elsevier Science or book distributors.
M, C #	Klugman, S.A., Panjer, H.H., Willmot, G.E.	*Loss Models: From Data to Decisions,* (Second Edition), 2004, John Wiley and Sons.
C #	Herzog, T.N	*Introduction to Credibility Theory* (Third Edition), 1999, ACTEX Publications
C	Casualty Actuarial Society	*Foundations of Casualty Actuarial Science (*Fourth Edition), 2001, CAS. Available as Study Note C-21-01.

# Indicates a new textbook, a new edition or new material.

Course(s)	Author(s)	Title
6	Babbel, D., Merrill, C.	*Valuation of Interest—Sensitive Financial Instruments*, (Second Printing), 1996, Frank J. Fabozzi & Associates. Order from John Wiley or book distributors
6 #	Bodie, Z., Kane, A., Marcus, A.	*Investments*, (Sixth Edition), 2005, Irwin/McGraw-Hill.
6	Fabozzi, F.J. (editor)	*Bond Portfolio Management,* (Second Edition), 2001, Frank J. Fabozzi & Assoc.
6	Fabozzi, F.J. (editor)	*Handbook of Fixed Income Securities*, (Sixth Edition), 2000, Irwin/McGraw-Hill.
6	Maginn, J.L., Tuttle, D.L.	*Managing Investment Portfolios*, (Second Edition), 1990. Out of Print. Available as Study note 6-36-04.
6	Panjer, H.H. (editor)	*Financial Economics*, 1998, The Actuarial Foundation. Order from book distributors or SOA.
7P	Jones, B.L.	*Modeling Policyholder Outcomes under a Disability Income-Type Long-Term Care Insurance Policy,* 2003 by Jones, B.L. (Interactive Notebook). This interactive notebook may be downloaded from SOA site http://www.soa.org/ccm/content/exams-education-jobs/candidate-and-exam-information/pre-test-syllabus-item/ **Please note: Candidates must purchase a copy of the software*, Actuarial Models and Modeling: An Interactive Approach,* 2000, by Jones, B.L. (CD-Rom) [ACTEX Publications] to run the interactive notebook above**
EA-1	Batten, R.W., London, R.L.	*A Guide for the Actuarial Student: Life Contingencies and Ruin Theory*, 1999, ACTEX Publications.
EA-1, M	Bowers, N.L., Jr. Gerber, H.U., Jones, D.A., Hickman, J.C., Nesbitt, C.J.	*Actuarial Mathematics*, (Second Edition), 1997, SOA.
EA-1, FM #	Broverman, S.A.	*Mathematics of Investment and Credit,* (Third Edition), 2005, ACTEX Publications.
EA-1	Brown, R.L.	*Introduction to Mathematics of Demography,* (Third Edition), 1997, ACTEX Publications.
EA-1, FM	Kellison, S.G.	*The Theory of Interest,* (Second Edition), 1991, Irwin/McGraw-Hill.
EA-1	Jordan, C.W.	*Life Contingencies,* (Second Edition), 1967, SOA.
EA-1	London, D.	*Survival Models and Their Estimation*, (Third Edition), 1997, ACTEX Publications.

# Indicates a new textbook, a new edition or new material.

Course(s)	Author(s)	Title
EA-1	Parmenter, M.M.	*The Theory of Interest and Life Contingencies with Pension Applications: A Problem-Solving Approach*, (Third Edition), 1999, ACTEX Publications.
EA-1	Zima, P., Brown, R.L.	*Mathematics of Finance*, (Fifth Edition), 2001, McGraw-Hill Ryerson Ltd.

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