

Individual Life and Annuities Design and Pricing Canada FALL 2008

Important Information

The examination for this course will be given on Thursday, October 30 from 8:30am–11:45am and 1:30pm–4:45pm and will consist of six hours of written-answer questions. A read-through time will be given prior to the start of the exam—15 minutes in the morning session and 15 minutes in the afternoon session. Information regarding registering for exams is available on the [Exam Registration](#) page.

Study notes are part of the required Course of Reading and are not available electronically. The [Introductory Study Note](#) (coming soon) has a complete listing of all study notes. Candidates must order the Complete or Revision study notes from the Society of Actuaries using the [Study Note Order Form](#). Past exams are available on the Exam Archives page of the SOA web site under [Multiple Choice/Essay Examinations](#).

Candidates should be sure to check the [Updates](#) page of the web site periodically for additional corrections or notices.

The candidate should be very familiar with the Learning Objectives as described in the Basic Education Catalog. These Learning Objectives are the first ingredient in developing the syllabus and also guide the examination committee when writing questions. The Learning Objectives set out the cognitive level needed to pass this exam. You will notice that the candidates are expected to “analyze,” “explain,” “calculate,” “describe,” “apply,” etc. While studying the syllabus material, candidates may want to refer back to the Learning Objectives to remain focused on the goals of the exam.

Exam: ILA - DP	
Learning Objectives	
1. Describe the product development process and how it applies to product development and design	
Learning Outcomes	
The candidate will be able to:	
<p>A. Describe the steps in the control cycle process within the context of product development</p> <ul style="list-style-type: none"> i) ID problem ii) Design product iii) Monitor <p>B. For a given product/situation, describe the steps in the product development process</p> <ul style="list-style-type: none"> i) Idea Generation ii) Feasibility iii) Planning the design iv) Setting out the requirements v) Actuarial development <ul style="list-style-type: none"> ▪ Assumptions ▪ Profit measures ▪ Modeling features or benefits <ul style="list-style-type: none"> - Equity linked (B-S) - Embedded options - ROP - Secondary guarantees - Payout Annuity Benefits - Etc ▪ Investment Strategy ▪ Choice of Model vi) Launch the product <p>C. Describe the iterative processes in the planning, and actuarial development steps</p> <p>D. Manage a product once it's on the books given its pricing, describe reasons why actual varies from expected given a situation and recommend changes to non-guaranteed elements for deviations from expected.</p>	

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Syllabus Resources

- Atkinson & Dallas, *Life Insurance Products and Finance*, 2000, Chapters 2, 3, 4, 5, 11, 14
- LOMA, *Life and Health Ins. Marketing*, Third Edition, 2003, pp.242–243
- ILA-D100-07: *World- Class New Product Development* – Dimancescu and Dwenger, 1996 – chapters 3, 4, 5 and 6.
- ILA-D101-07: Product Development Trends
- ILA-D102-07: Equity Indexed Annuities: Product Design and Pricing Considerations
- ILA-D103-07: Innovative Financing: Life Insurance Securitization, January 2006
- ILA-D111-07: LOMA, *Product Design for Life Insurance & Annuities*, Chapter 1 and Chapter 2 pages 31-33
- ILA-D112-08: Valuation of Living and Death Benefit Guarantees for Variable Annuities, pp. Sections 1 through 4.1.4 (pp. 3-15)
- ILA-D600-07: CIA Report – Lapse Experience Under Lapse Supported Policies (October 1999)
- ILA-D601-08: CIA Report – Lapse Experience under Universal Life Level Cost of Insurance Policies (October 2007)
- ILA-D607-08: Life Insurance Costing and Risk Analysis, CIA Task Force, 2008
- ILA-D608-08: Lapse Experience under Term-to-100 Insurance Policies, CIA
- Shane Chalke, “Macro Pricing: A Comprehensive Product Development Process”, TSA XLIII, 1991
<http://www.soa.org/library/research/transactions-of-society-of-actuaries/1990-95/1991/january/tsa91v436.pdf>
- *Incorporating Dynamic Policyholder Behavior Assumptions into Pricing of Variable Annuities*, Rebecca Scotchie, Product Matters, September 2006
- *Inflation-Indexed Income Annuities: Pricing Considerations and Investment Strategies*, Simpa Baiye, Product Matters, September 2006
- Pitfalls in EI Products, Product Development News, March 1998
<http://www.soa.org/library/newsletters/product-development-news/1998/march/pdn9803.pdf>
- Equity Indexed Universal Life: The Devil’s in the Details, Product Matters!, August, 2005
<http://www.soa.org/library/newsletters/product-development-news/2005/august/pdn0508.pdf>
- Variable Annuity Risk and Seeking the Perfect Hedge, Product Matters!, July, 2003
<http://www.soa.org/library/newsletters/product-development-news/2003/july/pdn0307.pdf>
- What’s Backing Your Life Insurance Guarantee?, The Actuary, February 2005
<http://www.soa.org/library/newsletters/the-actuary-magazine/2005/february/wha2005february.aspx>
- VUL Secondary Guarantees: Catalyst for Sales Rebound, Product Matters!, July 2003
<http://www.soa.org/library/newsletters/product-development-news/2003/july/pdn0307.pdf>
- “Managing Variable Policyholder Behavior Risk”, Product Matters!, March 2005
<http://www.soa.org/library/newsletters/product-development-news/2005/march/pdn0503.pdf>
- Return of Premium Term, Product Matters!, July 2004
<http://www.soa.org/library/newsletters/product-development-news/2004/july/pdn0407.pdf>
- “Term Mortality and Lapses”, Product Matters!, August 2005
<http://www.soa.org/library/newsletters/product-development-news/2005/august/pdn0508.pdf>
- “Designing & Pricing LTCI Combination Insurance Products”, Long Term Care News, December 2004
<http://www.soa.org/library/newsletters/long-term-care/2004/december/ltc0412.pdf>
- Does Preferred Wear Off?, Product Matters!, July 2004
<http://www.soa.org/library/newsletters/product-development-news/2004/july/pdn0407.pdf>
- Mortality Table Slope – the Discussion Goes On, Product Matters July 2004
<http://www.soa.org/library/newsletters/product-development-news/2004/july/pdn0407.pdf>
- The Process of Premium Formulation, Bob Shapiro, 50th Anniversary Monograph
<http://www.soa.org/library/research/transactions-of-society-of-actuaries/1982/january/tsa82v3418.pdf>

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Exam: ILA - DP	
Learning Objectives	
2. Understanding the drivers for product design (the idea step)	
Learning Outcomes	
For a given context or product, the candidate will be able to:	
<ul style="list-style-type: none"> A. Identify customers – internal and/or external B. Analyze the advantage/disadvantages of different internal drivers C. Analyze how the forces of the economy and demographics, impact product design D. Analyze consumer behavior impact product design. E. Analyze how the forces of the marketplace and competition impact product design. F. Describe the questions to ask the sales and marketing (incl. Agents, brokers and direct marketing) G. Describe how investment policy can impact design H. Describe how tax/regulation can drive (not just constrain) product design 	
Syllabus Resources	
<ul style="list-style-type: none"> • Atkinson & Dallas, <i>Life Insurance Products and Finance</i>, Chapter 8 • Hardy, <i>Investment Guarantees</i>, 2003, pp. 14 & 142–143 • LOMA, <i>Life and Health Insurance Marketing</i>, Third Edition, Chapters 5–9, 12–17 • <i>Marketing for Actuaries</i>, 2000 Edition, All Chapters 	

Exam: ILA - DP	
Learning Objectives	
3. Understand the feasibility step of product design (prudent, practical)	
Learning Outcomes	
For a given context or product, the candidate will be able to:	
<ul style="list-style-type: none"> A. Describe considerations for prudent and practical decision making B. Assess the risks underlying the design of certain products and features within those products as well as suggestions as to the management of such risks. C. Describe and analyze the tax and regulatory constraints – policyholder perspective 	
Syllabus Resources	
<ul style="list-style-type: none"> • Atkinson & Dallas, <i>Life Insurance Products and Finance</i>, 2000, Chapter 2 • Cuperfain and Marino, <i>Canadian Taxation of Life Insurance</i>, Fourth Edition, 2008 Chapters 1–3, 12–14, 18. The Third Edition of this text may also be used. The chapter references are the same. • Hardy, <i>Investment Guarantees</i>, 2003, Chapter 1 • ILA-D104-07: Easton and Harris <i>Actuarial Aspects of Individual Life Insurance and Annuity Contracts</i>, chapter 3 The Product Development Process • ILA-D111-07: LOMA, <i>Product Design for Life Insurance & Annuities</i>, Chapter 1 • ILA-D609-08: Notes on the Taxation of Life Insurance Policies and Annuity Contracts, including Introduction 	

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Exam: ILA – DP	
Learning Objectives	
4. Understand how to plan for and design new products	
Learning Outcomes	
<p>The candidate will be able to:</p> <p>A. Describe in detail the basic benefit/product types and their uses,</p> <p>B. Recommend designs for products and features to reach particular goals</p> <p>C. Demonstrate the integration of the results of the first steps into a recommended design</p>	
Syllabus Resources	
<ul style="list-style-type: none"> • Atkinson & Dallas, <i>Life Insurance Products and Finance</i>, 2000, Chapters 1 & 2 • ILA-D105-07: Life and Annuity Products and Features 	

Exam: ILA - DP	
Learning Objectives	
5. Consider the operational requirements for a particular product	
Learning Outcomes	
<p>For a given context or product, the candidate will be able to:</p> <p>A. Identify gaps between the product design and the operations of the company and procedures and systems</p> <p>B. Recommend ways to close the gaps</p>	
Syllabus Resources	
<ul style="list-style-type: none"> • Atkinson & Dallas, <i>Life Insurance Products and Finance</i>, 2000, Chapter 2 • Hidden Costs of Administering Complex Products”, Product Matters!, Nov. 2003 http://www.soa.org/library/newsletters/product-development-news/2003/november/pdn0311.pdf • Hidden Costs of Product Complexity, Product Matters!, Nov. 2003 http://www.soa.org/library/newsletters/product-development-news/2003/november/pdn0311.pdf • 2006 Marketing and Distribution Section Product Implementation Survey – Summary of Results, Product Matters! June 2007 http://www.soa.org/library/newsletters/product-development-news/2007/june/PDN0706.pdf 	

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Exam: ILA - DP	
Learning Objectives	
6. Understand the relationship between the product design and the selection of appropriate assumptions for pricing the product (mortality, persistency, investment returns, expenses, etc.).	
Learning Outcomes	
The candidate will be able to:	
<p>A. Identify the assumptions needed for a particular product design, including any embedded options, expenses, and reinsurance.</p> <p>B. Select appropriate assumptions for a given product design, reflecting</p> <ol style="list-style-type: none"> i) product characteristics ii) available experience data iii) the marketplace iv) underwriting v) distribution channel characteristics <p>C. Explain the effect of each assumption on product pricing.</p> <p>D. Incorporate expenses (fixed, variable, marginal and taxes (income and premium) into product pricing)</p> <p>E. How assumption setting reflects investment strategy e.g., hedging</p> <p>F. Special assumptions per special features – eg equity-linked, invest crediting,</p> <p>G. Data Quality (experience studies)</p>	
Syllabus Resources	
<ul style="list-style-type: none"> • Atkinson & Dallas, <i>Life Insurance Products and Finance</i>, 2000, Chapter 3, Chapter 7, Chapter 9, and Chapter 13 - Section 13.4 only • Hardy, <i>Investment Guarantees</i>, Chapters 2, 6 and 8 • ILA-D102-07: Equity Indexed Annuities - Product Design and Pricing Considerations Update • ILA-D105-07: Life and Annuity Products and Features • ILA-D106-07: Gross Premiums for Disability Waiver Benefits • ILA-D107-07: Experience Assumptions for Individual Life Insurance and Annuities • ILA-D108-07: Asset/Liability Management • ILA-D109-07: Moody's Investors Service Corporate Default and Recovery Rates, 1920-2006 • ILA-D602-07: Proceedings Volume XXIX, No 1: PD#11: Preferred Underwriting Discussion • ILA-D603-07: Proceedings: PD #24, Oct 2003, Preferred Term Update – An Update • ILA-D604-07: Proceedings: H5: Developments in the Canadian Segregated Fund Marketplace, Nov 2004 • ILA-D610-08: Pricing Critical Illness Insurance in Canada • ILA-D611-08: Product Design of Critical Illness Insurance in Canada • ILA-D612-08: Proceedings: The Challenges of Simplified Issue Products, Session IND-1, Vol. 37, No. 2, June 2006 • ILA-D613-08: Proceedings: Product Development 101, Session IND-2, Vol. 37, No. 2, June 2006 • Product Development Challenges in a Principles-Based World, Product Matters!, October 2007 http://www.soa.org/library/newsletters/product-development-news/2007/october/pm-0710.pdf • Across America, Valuation Actuaries Are Being Warmly Welcomed to Product Development Project Teams, Product Matters! February 2007 http://www.soa.org/library/newsletters/product-development-news/2007/February/PDN0702.pdf • The Response of Life Insurance Pricing to Life Settlements, Product Matters!, September 2006 http://www.soa.org/library/newsletters/product-development-news/2006/september/PDN0609.pdf • Living to 100 “Ending the Mortality Table” http://www.soa.org/library/monographs/retirement-systems/living-to-100-and-beyond/2005/january/m-li05-1-ix.pdf • ASOP #23 Data Quality http://www.actuarialstandardsboard.org/pdf/asops/asop023_097.pdf 	

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Exam: ILA - DP	
Learning Objectives	
7. Understand the use of profit measures in Pricing	
Learning Outcomes	
The candidate will be able to:	
<ul style="list-style-type: none"> A. Measure profitability B. Analyze array of profit measures C. Determine statutory vs. GAAP profit measures D. Describe the capital requirements for the product E. Recommend appropriate measure for particular problem your solving 	
Syllabus Resources	
<ul style="list-style-type: none"> • Atkinson & Dallas, <i>Life Insurance Products and Finance</i>, 2000, Chapters 10 and 11 • Pricing in a Return-on-Equity Environment, TSA XXXIX, 1987 http://www.soa.org/library/research/transactions-of-society-of-actuaries/1987/january/tsa87v3911.pdf • Stochastic Pricing, Session 62 TS from November 2005 SOA Annual Meeting http://www.soa.org/files/pdf/062bk-annual05.pdf 	

Exam: ILA - DP	
Learning Objectives	
8. Understand pricing for particular features and benefits	
Learning Outcomes	
The candidate will be able to:	
<ul style="list-style-type: none"> A. Price products with different features including: <ul style="list-style-type: none"> i) Riders ii) Policyholder Dividends iii) Equity linked (B-S) iv) Embedded Options v) ROP vi) Secondary Guarantees vii) Payout Annuity Benefits viii) Reinsurance ix) Crediting methodology x) Other non-guaranteed elements B. Identify the most influential assumptions for the particular feature 	
Syllabus Resources	
<ul style="list-style-type: none"> • Atkinson & Dallas, <i>Life Insurance Products and Finance</i>, 2000, Chapter 13 • Hardy <i>Investment Guarantee</i> 2005, Chapters 6, 8 (p. 133-143), 12 and 13 • ILA-D102-07: Equity Indexed Annuities: Product Design and Pricing Considerations • ILA-D105-07: Life and Annuity Products and Features • ILA-D106-07: Gross Premiums for Disability Waiver • ILA-D110-07: Policyholder Dividends • CIA Recommendations – Dividend Determination and Illustration”, June 1982 http://www.actuaries.ca/members/publications/1982/8207e.pdf • Return of Premium Term, Product Matters! July 2004 http://www.soa.org/library/newsletters/product-development-news/2004/july/pdn0407.pdf 	

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Exam: ILA - DP	
Learning Objectives	
9. Understand modeling approaches and interpretation	
Learning Outcomes	
The candidate will be able to: A. Explain how a stochastic model would be used for pricing B. Describe the advantages and disadvantages of stochastic and deterministic modeling approached C. Interpret results of a stochastic model	
Syllabus Resources	
<ul style="list-style-type: none">• Hardy, <i>Investment Guarantees</i>, 2003, Chapter 9.• RSA Vol 27, #2 Session 86PD Stochastic Pricing http://www.soa.org/library/proceedings/record-of-the-society-of-actuaries/2000-09/2001/january/rsa01v27n286pd.pdf	