

# Individual Life and Annuity Design and Pricing U.S. November 2007

Exam: ILA – DP, U.S.	
Learning Objectives	
<b>1. Describe the product development process and how it applies to product development and design</b>	

Learning Outcomes
<p>The candidate will be able to:</p> <p>A. Describe the steps in the control cycle process within the context of product development</p> <ol style="list-style-type: none"> <li>i) ID problem</li> <li>ii) Design product</li> <li>iii) Monitor</li> </ol> <p>B. For a given product/situation, describe the steps in the product development process</p> <ol style="list-style-type: none"> <li>i) Idea Generation</li> <li>ii) Feasibility</li> <li>iii) Planning the design</li> <li>iv) Setting out the requirements</li> <li>v) Actuarial development             <ul style="list-style-type: none"> <li>▪ Assumptions</li> <li>▪ Profit measures</li> <li>▪ Modeling features or benefits                 <ul style="list-style-type: none"> <li>- Equity linked (B-S)</li> <li>- Embedded options</li> <li>- ROP</li> <li>- Secondary guarantees</li> <li>- Payout Annuity Benefits</li> <li>- Etc</li> </ul> </li> <li>▪ Investment Strategy</li> <li>▪ Choice of Model</li> </ul> </li> <li>vi) Launch the product</li> </ol> <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>

Syllabus Resources
<ul style="list-style-type: none"> <li>• <i>Life Insurance Products and Finance</i>, Atkinson &amp; Dallas, Chapter 2, 3, 4, 5, 11, 14</li> <li>• <i>Life and Health Ins. Marketing</i>, LOMA pp.242-243</li> <li>• ILA-D100-07: <i>World-Class New Product Development</i> – Dimancescu and Dwenger, 1996 – chapters 3, 4, 5 &amp;6</li> <li>• ILA-D101-07 (Formerly 8IC-100-00): Product Development Trends</li> <li>• ILA-D102-07 (Formerly 8IC-107-04): Equity Indexed Annuities: Product Design and Pricing Considerations</li> <li>• ILA-D103-07: Innovative Financing: Life Insurance Securitization</li> <li>• ILA-D111-07 LOMA, <i>Product Design for Life Insurance &amp; Annuities</i>, Chapter 1, Chapter 2 pages 31-33</li> <li>• Shane Chalke, “Macro Pricing: A Comprehensive Product Development Process”, TSA XLIII, 1991 <a href="http://www.soa.org/library/research/transactions-of-society-of-actuaries/1990-95/1991/january/tsa91v436.pdf">http://www.soa.org/library/research/transactions-of-society-of-actuaries/1990-95/1991/january/tsa91v436.pdf</a></li> <li>• “Incorporating Dynamic Policyholder Behavior Assumptions into Pricing of Variable Annuities”, Rebecca Scotchie, Product Matters, September 2006 <a href="http://66.216.104.119/library-pdf/PDN0609.pdf">http://66.216.104.119/library-pdf/PDN0609.pdf</a></li> <li>• “Inflation-Indexed Income Annuities: Pricing Considerations and Investment Strategies”, Simpa Baiye, Product Matters, September, 2006 <a href="http://66.216.104.119/library-pdf/PDN0609.pdf">http://66.216.104.119/library-pdf/PDN0609.pdf</a></li> </ul>

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- “Pitfalls in EI Products” March (45)1998, <http://www.soa.org/library/newsletters/product-development-news/1998/march/pdn9803.pdf>
- “Recent Developments in the Annuity World” July (59)2004 <http://www.soa.org/library/newsletters/product-development-news/2004/july/pdn0407.pdf>
- “EIUL: The Devil’s in the Details” August (62)2005 <http://www.soa.org/library/newsletters/product-development-news/2005/august/pdn0508.pdf>
- “Variable Annuity Risk and Seeking the Perfect Hedge”, July (56)2003 <http://www.soa.org/library/newsletters/product-development-news/2003/july/pdn0307.pdf>
- “Whither the VA?” November (57)2003 <http://www.soa.org/library/newsletters/product-development-news/2003/november/pdn0311.pdf>
- “Recent Developments in the Annuity World” July (59) 2004\
- “What’s Backing Your Life Insurance Guarantee?” <http://www.soa.org/library/newsletters/the-actuary-magazine/2005/february/wha2005february.aspx>
- “VUL Secondary Guarantees: Catalyst for Sales Rebound”, July (56)2003 <http://www.soa.org/library/newsletters/product-development-news/2003/july/pdn0307.pdf>
- “Managing Variable Policyholder Behavior Risk”, March (61)2005 <http://www.soa.org/library/newsletters/product-development-news/2005/march/pdn0503.pdf>
- “Return of Premium Term”, , July (59)2004 <http://www.soa.org/library/newsletters/product-development-news/2004/july/pdn0407.pdf>
- “Term Mortality and Lapses” August (62) 2005 <http://www.soa.org/library/newsletters/product-development-news/2005/august/pdn0508.pdf>
- “Lapse Experience Under Lapse Supported Products” December (63) 2005 <http://www.soa.org/library/newsletters/product-development-news/2005/december/pdn0512.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>
- “Does Preferred Wear Off?” *Product Matters*, July 2004 <http://www.soa.org/library/newsletters/product-development-news/2004/july/pdn0407.pdf>
- “Designing & Pricing LTCI Combination Insurance Products” *Long Term Care News*, December (13) 2004 <http://www.soa.org/library/newsletters/long-term-care/2004/december/ltc0412.pdf>
- “The Process of Premium Formulation” Bob Shapiro 50<sup>th</sup> Anniversary monograph <http://www.soa.org/library/monographs/50th-anniversary/product-development-section/1999/january/m-as99-3-05.pdf>

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Exam: ILA – DP, U.S.	
Learning Objectives	
<b>2. Understanding the drivers for product design (the idea step)</b>	
Learning Outcomes	
For a given context or product, the candidate will be able to:	
<ul style="list-style-type: none"> <li>A. Identify customers – internal and/or external</li> <li>B. Analyze the advantage/disadvantages of different internal drivers</li> <li>C. Analyze how the forces of the economy and demographics, impact product design</li> <li>D. Analyze consumer behavior impact product design.</li> <li>E. Analyze how the forces of the marketplace and competition impact product design.</li> <li>F. Describe the questions to ask the sales and marketing (incl. Agents, brokers and direct marketing)</li> <li>G. Describe how investment policy can impact design</li> <li>H. Describe how tax/regulation can drive (not just constrain) product design</li> </ul>	
Syllabus Resources	
<ul style="list-style-type: none"> <li>• <i>Life Insurance Products and Finance</i>, Atkinson &amp; Dallas, Chapter 8</li> <li>• <i>Investment Guarantees</i>, Hardy, (p. 14 &amp; 142-143)</li> <li>• <i>Life Insurance and Modified Endowments Under IRC §7702 and §7702A</i>, Chapters 2 and 6</li> <li>• <i>Life and Health Insurance Marketing</i>, LOMA, Third Edition, Chapters 5-9, 12-17</li> <li>• <i>Marketing for Actuaries</i>, 2000 Edition, All Chapters</li> </ul>	

Exam: ILA – DP, U.S.	
Learning Objectives	
<b>3. Understand the feasibility step of product design (prudent, practical)</b>	
Note: This step is before pricing	
Learning Outcomes	
For a given context or product, the candidate will be able to:	
<ul style="list-style-type: none"> <li>A. Describe considerations for prudent and practical decision making</li> <li>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.</li> <li>C. Describe and analyze the tax and regulatory constraints – policyholder perspective</li> </ul>	
Syllabus Resources	
<ul style="list-style-type: none"> <li>• <i>Life Insurance Products and Finance</i>, Atkinson &amp; Dallas, Chapter 2</li> <li>• <i>Life Insurance and Modified Endowments Under IRC §7702 and §7702A</i>, Ch.1-4, 6, , 9</li> <li>• <i>Investment Guarantees</i>, Hardy, Ch. 1</li> <li>• ILA-D111-07:LOMA, <i>Product Design for Life Insurance &amp; Annuities</i>, Chapter 1</li> <li>• ILA-D104-07 <i>Actuarial Aspects of Individual Life Insurance and Annuity Contracts</i>, chapter 3</li> <li>• ILA-D800-07 (Formerly 8IC-101-00): <i>Life Insurance and Annuity Nonforfeiture Practices</i> -</li> <li>• ILA-D801-07 (Formerly 8IC-104-03): <i>NAIC Standard Nonforfeiture Law for Life Insurances: Sections 1-4, 5c, 6-9</i></li> <li>• ILA-D802-07 (Formerly 8IC-106-03): <i>NAIC Standard Nonforfeiture Law for Individual Deferred Annuities</i> -</li> </ul>	

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- ASOP #1 Nonguaranteed Charges or Benefits for Life Insurance Policies and Annuity Contracts  
[http://www.actuarialstandardsboard.org/pdf/asops/asop001\\_092.pdf](http://www.actuarialstandardsboard.org/pdf/asops/asop001_092.pdf)

Exam: ILA – DP, U.S.

Learning Objectives

#### 4. Understand how to plan for and design new products

Learning Outcomes

The candidate will be able to:

- A. Describe in detail the basic benefit/product types and their uses,
- A. Recommend designs for products and features to reach particular goals
- B. Demonstrate the integration of the results of the first steps into a recommended design

Syllabus Resources

- *Life Insurance Products and Finance*, Atkinson & Dallas, Ch. 1 & 2
- ILA-D105-07 (Formerly 8IC-102-00): Life and Annuity Products and Features

Exam: ILA – DP, U.S.

Learning Objectives

#### 5. Consider the operational requirements for a particular product

Learning Outcomes

For a given context or product, the candidate will be able to:

- A. Identify gaps between the product design and the operations of the company and procedures and systems
- B. Recommend ways to close the gaps

Syllabus Resources

- *Life Insurance Products and Finance*, Atkinson & Dallas, Chapter 2, Product Development
- “Hidden Costs of Administering Complex Products” in Nov. 2003 Issue of Product Matters  
<http://www.soa.org/library/newsletters/product-development-news/2003/november/pdn0311.pdf>
- “Hidden Costs of Product Complexity” in Nov. 2003 Issue of Product Matters  
<http://www.soa.org/library/newsletters/product-development-news/2003/november/pdn0311.pdf>

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Exam: ILA – DP, U.S.	
Learning Objectives	
<b>6. Understand the relationship between the product design and the selection of appropriate assumptions for pricing the product (mortality, persistency, investment returns, expenses, etc.).</b>	
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> <ul style="list-style-type: none"> <li>i) product characteristics</li> <li>ii) available experience data</li> <li>iii) the marketplace</li> <li>iv) underwriting</li> <li>v) distribution channel characteristics</li> </ul> <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 – e.g. equity-linked, invest crediting,</p> <p>G. Data Quality (experience studies)</p>	
Syllabus Resources	
<ul style="list-style-type: none"> <li>• Atkinson &amp; Dallas, <i>Life Insurance Products and Finance</i>, Chapter 3, 7, 9; Chapter 13.4 Annuity and Investment Products</li> <li>• Hardy, <i>Investment Guarantees</i>, Ch. 2, 6, 8</li> <li>• ILA-D106-07 (Formerly 8IC-201-00): Gross Premiums for Disability Waiver Benefits</li> <li>• ILA-D107-07 (Formerly 8IC-200-00): Experience Assumptions for Individual Life Insurance and Annuities</li> <li>• Living to 100 “Ending the Mortality Table” <a href="http://www.soa.org/library/monographs/retirement-systems/living-to-100-and-beyond/2005/january/m-li05-1-ix.pdf">http://www.soa.org/library/monographs/retirement-systems/living-to-100-and-beyond/2005/january/m-li05-1-ix.pdf</a></li> <li>• Pricing a Select and Ultimate Annual Renewable Term Product, TSA Vol 32 <a href="http://www.soa.org/library/research/transactions-of-society-of-actuaries/1980/january/tsa80v3216.pdf">http://www.soa.org/library/research/transactions-of-society-of-actuaries/1980/january/tsa80v3216.pdf</a></li> <li>• ILA-D102-07 (Formerly 8IC-107-04): Equity Indexed Annuities - Product Design and Pricing Considerations</li> <li>• ILA-D108-07 (Formerly 8FE-316-03): Asset/Liability Management</li> <li>• ILA-D109-07: Corporate Default and Recovery Rates, 1920-2006</li> <li>• ILA-D105-07 (Formerly 8IC-102-00): Life and Annuity Products and Features</li> <li>• ASOP #23 Data Quality <a href="http://www.actuarialstandardsboard.org/pdf/asops/asop023_097.pdf">http://www.actuarialstandardsboard.org/pdf/asops/asop023_097.pdf</a></li> </ul>	

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Learning Objectives	
<b>7. Understand the use of profit measures in Pricing</b>	
Learning Outcomes	
The candidate will be able to:	
<ul style="list-style-type: none"> <li>A. Measure profitability</li> <li>B. Analyze array of profit measures</li> <li>C. Determine statutory vs. GAAP profit measures</li> <li>D. Describe the capital requirements for the product</li> <li>E. Recommend appropriate measure for particular problem your solving</li> </ul>	
Syllabus Resources	
<ul style="list-style-type: none"> <li>• <i>Life Insurance Products and Finance</i>, Atkinson &amp; Dallas, Chapter 10, 11</li> <li>• “Pricing in a Return-on-Equity Environment”, TSA XXXIX, 1987 <a href="http://www.soa.org/library/research/transactions-of-society-of-actuaries/1987/january/tsa87v3911.pdf">http://www.soa.org/library/research/transactions-of-society-of-actuaries/1987/january/tsa87v3911.pdf</a></li> </ul>	

Exam: ILA - DP	
Learning Objectives	
<b>8. Understand pricing for particular features and benefits</b>	
Learning Outcomes	
The candidate will be able to:	
<ul style="list-style-type: none"> <li>A. Price products with different features including: <ul style="list-style-type: none"> <li>i) Riders</li> <li>ii) Policyholder Dividends</li> <li>iii) Equity linked (B-S)</li> <li>iv) Embedded Options</li> <li>v) ROP</li> <li>vi) Secondary Guarantees</li> <li>vii) Payout Annuity Benefits</li> <li>viii) Reinsurance</li> <li>ix) Crediting methodology</li> <li>x) Other non-guaranteed elements</li> </ul> </li> <li>B. Identify the most influential assumptions for the particular feature</li> </ul>	
Syllabus Resources	
<ul style="list-style-type: none"> <li>• Atkinson &amp; Dallas, <i>Life Insurance Products and Finance</i>, Chapter 13</li> <li>• Hardy, <i>Investment Guarantees</i>, CH. 6, 8 (pp. 133–143 only), 12, 13</li> <li>• ILA-D102-07 (Formerly 8IC-107-04): Equity Indexed Annuities: Product Design and Pricing Considerations</li> <li>• ILA-D106-07 (Formerly 8IC-201-00): Gross Premiums for Disability Waiver Benefits</li> <li>• ILA-D110-07 (Formerly 8IC-103-01): Policyholder Dividends</li> <li>• ASOP #1 <a href="http://www.actuarialstandardsboard.org/pdf/asops/asop001_092.pdf">http://www.actuarialstandardsboard.org/pdf/asops/asop001_092.pdf</a></li> </ul>	

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- ILA-D105-07 (Formerly 8IC-102): Life and Annuity Products and Features
- 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, U.S.	
Learning Objectives	
<b>9. Understand modeling approaches and interpretation</b>	
Learning Outcomes	
<p>The candidate will be able to:</p> <p>A. Explain how a stochastic model would be used for pricing</p> <p>B. Describe the advantages and disadvantages of stochastic and deterministic modeling approached</p> <p>C. Interpret results of a stochastic model</p>	
Syllabus Resources	
<ul style="list-style-type: none"> <li>• <i>Investment Guarantees</i>, Hardy, Ch. 9</li> <li>• “Stochastic Pricing” <i>RSA Vol 27, No 2</i> Session 86PD Stochastic Pricing  <a href="http://www.soa.org/library/proceedings/record-of-the-society-of-actuaries/2000-09/2001/january/rsa01v27n286pd.pdf">http://www.soa.org/library/proceedings/record-of-the-society-of-actuaries/2000-09/2001/january/rsa01v27n286pd.pdf</a> </li> </ul>	

Exam: ILA – DP, U.S.	
Learning Objectives	
<b>10. Understand the final steps to launch a product</b>	
Learning Outcomes	
<p>The candidate will be able to (for the U.S. or Canada):</p> <p>A. Demonstrate that contract language matches the pricing</p> <p>B. Describe the filing process</p> <p>C. Describe what needs to be filed</p> <p>D. Create policyholder illustrations which meet requirements</p> <p>E. Describe the reasonable charges requirement</p> <p>F. Describe the replacement regulations</p>	
Syllabus Resources	
<ul style="list-style-type: none"> <li>• ILA-D803-07: The Role of the Actuary in Product Roll-out , Theodore</li> </ul>	