

# General Insurance Ratemaking and Reserving Exam

Spring 2020

## Important Exam Information:

### [Exam Registration](#)

Candidates may register online or with an application.

### Order Study Notes

There is no study note package for this examination.

### [Introductory Study Note](#)

The Introductory Study Note has a complete listing of all readings as well as errata and other important information.

### Case Study

There is no case study for this examination.

### [Past Exams](#)

Past copies of this exam from 2013-present are available on the SOA website.

### [Updates](#)

Candidates should be sure to check the Updates page on the exam home page periodically for additional corrections or notices.

### Appendices

The Appendices to *Fundamentals of General Insurance Actuarial Analysis* are part of the course of reading for this examination. They are mentioned in specific topics in the syllabus, although they apply to multiple topics. As a result, they can be read with the various topics or separately.

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<b>1. Topic: Introduction and Key Considerations</b>
<b>Learning Objectives</b>
The candidate will understand the key considerations for and key concepts underlying general insurance actuarial work.
<b>Learning Outcomes</b>
The Candidate will be able to: <ul style="list-style-type: none"><li>a) Identify sources of professionalism requirements and good practice</li><li>b) Demonstrate knowledge of good practice related to actuarial work</li><li>c) Use the actuarial control cycle to frame actuarial work</li><li>d) Understand the components of ultimate values</li><li>e) Explain how estimates of ultimate values are used</li><li>f) Demonstrate the importance of understanding key terminology and interrelationships</li><li>g) Identify different types of data used for actuarial work</li><li>h) Explain the responsibilities of the actuary related to data</li><li>i) Describe how and why data are segregated and aggregated</li><li>j) Describe qualitative information required for actuarial work</li><li>k) Understand the sources of data and information for actuarial work</li><li>l) Understand credibility as used for actuarial work</li><li>m) Explain the application of trend adjustments in actuarial work</li><li>n) Illustrate the types of trend that influence the future cost of claims, expenses, and premiums</li><li>o) Identify the actuary's responsibilities with regards to documentation for actuarial work</li><li>p) Describe the role of professional judgment in actuarial work</li><li>q) Understand the types of reinsurance and key reinsurance terms</li><li>r) Explain the principal functions of reinsurance</li><li>s) Analyze and describe the types of reinsurance</li><li>t) Understand important reinsurance contract provisions that potentially affect actuarial work</li></ul>
<b>Resources</b>
<ul style="list-style-type: none"><li>• <i>Fundamentals of General Insurance Actuarial Analysis</i>, J. Friedland<ul style="list-style-type: none"><li>○ Part 1: Introduction</li><li>○ Part 2: Key Concepts</li><li>○ <a href="#">2019 Supplement</a> (Chapter 4 and Appendix H)</li></ul></li><li>• <i>Actuarial Standards of Practice, Actuarial Standards Board of the American Academy of Actuaries</i>,<ul style="list-style-type: none"><li>○ No. 25, Credibility Procedures, 2013</li><li>○ <a href="http://www.actuarialstandardsboard.org/standards-of-practice/">http://www.actuarialstandardsboard.org/standards-of-practice/</a></li></ul></li></ul>

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**2. Topic: Preparing Claims and Exposure Data for Actuarial Work**

**Learning Objectives**

The candidate will demonstrate the ability to prepare claims and exposure data for general insurance actuarial work.

**Learning Outcomes**

The Candidate will be able to:

- a) Create development triangles of claims and counts from detailed claim transaction data
- b) Describe the different types of exposures used for conducting actuarial work
- c) Calculate written, earned, in-force and unearned premiums for portfolios of policies with various policy terms and earnings patterns
- d) Adjust historical earned premiums to current rate levels
- e) Understand types of changes influencing average premium levels
- f) Describe adjustments needed to estimate ultimate premiums

**Resources**

- *Fundamentals of General Insurance Actuarial Analysis*, J. Friedland
  - Part 3: Preparing the Data
  - [2019 Supplement](#) (Chapter 11)

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**3. Topic: Projecting Ultimate Claims**

**Learning Objectives**

The candidate will know how to calculate and evaluate projected ultimate values.

**Learning Outcomes**

The Candidate will be able to:

- a) Identify considerations for selecting methods for estimating ultimate claims
- b) Identify and describe good practice related to projecting ultimate claims with regard to required data, large claims, reinsurance recoverables, and comparison of current to prior actuarial work
- c) Identify the types of development triangles that can be used for investigative testing
- d) Analyze development triangles for investigative testing
- e) Describe the key assumptions underlying the following projection methods: development method, frequency-severity methods, expected method, Bornhuetter Ferguson method, Benktander method, Cape Cod method, Generalized Cape Cod, and Berquist-Sherman adjustments to the development method
- f) Demonstrate knowledge of good practice related to projecting ultimate values
- g) Estimate ultimate values using the methods cited in (e)
- h) Explain the effect of changing conditions on the projection methods cited in (e)
- i) Assess the appropriateness of the projection methods cited in (e) in varying circumstances
- j) Evaluate and justify selections of ultimate values based on the methods cited in (e)
- k) Estimate ultimate claims by layer using common methods
- l) Understand the differences in development patterns and trends for various claim layers

**Resources**

- *Fundamentals of General Insurance Actuarial Analysis*, J. Friedland
  - Part 4: Basic Methods for Estimating Ultimate Claims
  - Appendices A through F
  - [2019 Supplement](#) (Chapters 14, 19, and 20, and Appendix I)

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<b>4. Topic: Financial Reporting</b>
<b>Learning Objectives</b>
The candidate will understand financial reporting of claim liabilities and premium liabilities.
<b>Learning Outcomes</b>
The Candidate will be able to: <ul style="list-style-type: none"><li>a) Describe the key assumptions underlying ratio and count-based methods for estimating unpaid unallocated loss adjustment expenses</li><li>b) Estimate unpaid unallocated loss adjustment expenses using ratio and count-based methods</li><li>c) Evaluate and justify selections of unpaid unallocated loss adjustment expenses based on ratio and count-based methods</li><li>d) Demonstrate knowledge of good practice related to actuarial work supporting financial reporting</li><li>e) Describe the components of claim liabilities in the context of financial reporting</li><li>f) Calculate claim liabilities</li><li>g) Describe the components of premium liabilities in the context of financial reporting</li><li>h) Evaluate premium liabilities</li></ul>
<b>Resources</b>
<ul style="list-style-type: none"><li>• <i>Fundamentals of General Insurance Actuarial Analysis</i>, J. Friedland<ul style="list-style-type: none"><li>○ Part 5: Financial Reporting and the Establishment of Reserves</li><li>○ Appendices A through F</li></ul></li></ul>

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<b>5. Topic: Trending</b>
<b>Learning Objectives</b>
The candidate will understand trending procedures as applied to ultimate claims, exposures and premiums.
<b>Learning Outcomes</b>
The Candidate will be able to: <ul style="list-style-type: none"><li>a) Identify and describe the influences of portfolio changes on claim frequency and severity</li><li>b) Identify the time periods associated with trending procedures</li><li>c) Analyze and evaluate trend for claims (including frequency, severity, and pure premium) and exposures (including inflation-sensitive exposures and premiums)</li><li>d) Choose trend rates for claims (frequency, severity, and pure premium) and exposures</li><li>e) Calculate trend factors for claims and exposures</li></ul>
<b>Resources</b>
<ul style="list-style-type: none"><li>• <i>Fundamentals of General Insurance Actuarial Analysis</i>, J. Friedland<ul style="list-style-type: none"><li>○ Part 6: Trending Procedures</li><li>○ Appendices A through F</li></ul></li></ul>

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**6. Topic: Ratemaking**

**Learning Objectives**

The candidate will understand how to apply the fundamental ratemaking techniques of general insurance.

**Learning Outcomes**

The Candidate will be able to:

- a) Describe the objectives of general insurance rate regulation
- b) Identify the different types of rate regulatory approaches for general insurance
- c) Describe the purpose of base rates and rating factors and explain how they are used to determine an insured's premium
- d) Quantify different types of expenses required for ratemaking including expense trending procedures
- e) Incorporate underwriting profit and contingency margins in ratemaking
- f) Explain the requirements for loadings for catastrophes and large claims in ratemaking
- g) Calculate loadings for catastrophes and large claims
- h) Apply loadings for catastrophes and large claims in ratemaking
- i) Describe the claim ratio and pure premium methods of ratemaking
- j) Calculate indicated rates and indicated rate changes using the claim ratio and pure premium methods
- k) Demonstrate the use of credibility in ratemaking
- l) Calculate risk classification changes
- m) Describe key considerations in the analysis of deductible factors and increased limits factors
- n) Calculate deductible factors and increased limits factors
- o) Explain coinsurance and coinsurance penalties
- p) Analyze coinsurance formulas to calculate the amount retained by the insured and paid by the insurer given various scenarios of coinsurance requirements, amounts insured, and covered losses
- q) Distinguish occurrence-based and claims-made based coverage
- r) Calculate rates for claims-made coverage as well as claims-made maturity and tail factors
- s) Explain the premise of experience rating
- t) Describe the types of experience rating used with general insurance
- u) Determine experience rating modification factors and experience rating adjustments

**Resources**

- *Fundamentals of General Insurance Actuarial Analysis*, J. Friedland
  - Part 7: Ratemaking
  - Appendices A through F

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<b>7. Topic: Monitoring Results</b>
<b>Learning Objectives</b>
The candidate will understand the need for monitoring results.
<b>Learning Outcomes</b>
The Candidate will be able to: <ul style="list-style-type: none"><li>a) Describe the role of monitoring in ultimate values and pricing</li><li>b) Analyze actual claims experience relative to expectations</li><li>c) Develop plans for future actuarial work based on the results of monitoring</li><li>d) Demonstrate the use of the actuarial control cycle in the context of monitoring</li></ul>
<b>Resources</b>
<ul style="list-style-type: none"><li>• <i>Fundamentals of General Insurance Actuarial Analysis</i>, J. Friedland<ul style="list-style-type: none"><li>○ Part 8: Monitoring Results</li><li>○ Appendices A through F</li></ul></li></ul>



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**8. Topic: Analyze and evaluate real-life scenarios**

**Learning Objectives**

The candidate will be able to define an approach for actuarial analyses supporting financial reporting and ratemaking analyses under various real-life scenarios. The candidates will be able to define funding requirements for self-insurers.

**Learning Outcomes**

The Candidate will be able to:

- a) Identify data and information requirements
- b) Conduct investigative testing
- c) Choose projection methods to estimate ultimate values
- d) Estimate ultimate values
- e) Justify selections of ultimate values
- f) Develop reserves for financial reporting
- g) Conduct self-insurer funding analyses for prospective periods including increased limits and deductible analyses
- h) Design a self-insurer cost allocation system based on fundamentals of experience rating

**Resources**

- *Fundamentals of General Insurance Actuarial Analysis*, J. Friedland
  - Appendices A through F
  - [2019 Supplement](#) Appendix I

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<b>9. Topic: Catastrophe Modeling</b>
<b>Learning Objectives</b>
The candidate will understand the nature and application of catastrophe models used to manage risks from natural disasters.
<b>Learning Outcomes</b>
The Candidate will be able to: <ul style="list-style-type: none"><li>a) Describe the structure and modules of catastrophe models</li><li>b) Apply catastrophe modeling results in ratemaking, loss mitigation, risk selection, and reinsurance</li><li>c) Describe the advantages and limitations of catastrophe models</li><li>d) Understand and apply common risk metrics associated with catastrophe modeling results</li><li>e) Understand the role of governance in catastrophe models</li></ul>
<b>Resources</b>
<ul style="list-style-type: none"><li>• “Uses of Catastrophe Model Output,” American Academy of Actuaries, July 2018. <a href="https://www.actuary.org/sites/default/files/files/publications/Catastrophe_Modeling_Monograph_07.25.2018.pdf">https://www.actuary.org/sites/default/files/files/publications/Catastrophe_Modeling_Monograph_07.25.2018.pdf</a></li></ul>