# ACTL10001 – Introduction to Actuarial Studies

**Study Notes**

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# 1 The actuarial profession and professionalism

A 34-year-old with a mortgage and a toddler takes $750,000 of term life through her super fund. A hospital insurer has to file next year's premium in a market where community rating forbids charging the sick more than the well. A motor insurer, after a summer of floods, has to say whether its capital still covers the tail of the next weather year. A defined-contribution fund has to tell a 25-year-old, without promising a pension, what a 12% Superannuation Guarantee contribution might accumulate to if returns, fees and contribution patterns behave in a stated way. Those problems do not share a product. They share a structure: money whose size depends on time, and on whether a person is alive, disabled, hospitalised, or has crashed a car. Actuarial work is the organised attempt to put a number on that structure, and then to live with the number being wrong.

> **Definition**
> An *actuary* is a professional who measures and manages the financial impact of risk, uncertainty and opportunity, using mathematics, statistics, data and financial theory. The work is not "predicting the future." It is constructing a model of possible futures, attaching probabilities and present values, stating the assumptions, and advising a decision maker who still has to choose. In Australia the professional body is the Actuaries Institute. The protected designations are Associate (AIAA) and Fellow (FIAA); members who have not attained those designations do not use the title "Actuary" when providing services.

The subject looks at that profession through two lenses, and they are not optional extras for each other. The *technical* lens is the machinery: pooling and the principle of insurance; compound interest functions and the valuation of annuities, bonds and loans; demography; mortality models and the life table; and the combination of those tools in the pricing of basic life covers. The *practice* lens is where the machinery is used, and under what professional constraints: data and predictive analytics; risk management; life insurance and wealth management; superannuation; health insurance; general insurance. A student who can compute $a_{\overline{n}|}$ but cannot say why a super fund's group-life premium is a different object from a retail term premium has only half the subject. A student who can name practice areas but cannot discount a contingent payment has the other half.

## 1.1 What the work actually is

The Institute's public description is compact: actuaries measure and manage the impact of risk, uncertainty and opportunity so that businesses, communities and governments can prepare. Unpacked, that usually means four activities that recur across practice areas.

| Activity | What is being produced | Where it shows up |
|---|---|---|
| Pricing | A premium, contribution rate, or fee that is intended to be adequate, not excessive, and not unfairly discriminatory, given the risk and the expenses. | Term life, motor, PHI, group cover in super, loan pricing in a bank. |
| Reserving / valuation | A present-value balance sheet for promises already made. The question is not "what will we charge next year" but "do we have enough, on stated assumptions, for what we have already sold." | Life and GI technical provisions; super defined-benefit liabilities; appointed-actuary advice. |
| Capital and risk | How much extra is needed because the mean is not the outcome. Risk appetite, stress, and the chance the firm is ruined. | APRA prudential capital; ERM frameworks; reinsurance; investment strategy. |

| Activity | What is being produced | Where it shows up |
|---|---|---|
| Design and advice | The shape of the promise: what is covered, who is pooled with whom, how benefits interact with tax, the Age Pension, and behaviour. | Product design; trustee advice; public policy; consulting. |

Those four are not a career menu. A pricing memo that ignores the capital the premium will consume is an unfinished price. A reserve that is computed on last year's basis while the claims process has shifted is an unfinished valuation. Design without a price is a brochure. The same person may not sign all four, but the same subject has to hold them together.

Those activities sit inside organisations that are not mathematics departments. Life insurers, general insurers and most superannuation funds in Australia are prudentially supervised by the Australian Prudential Regulation Authority (APRA). Conduct and disclosure sit with the Australian Securities and Investments Commission (ASIC). Private health insurers have their own community-rating and risk-equalisation rules. An actuary who produces a technically elegant premium that the board cannot explain to APRA, or that a trustee cannot defend to members, has not finished the job.

Over a quarter of Australian actuaries still work in life insurance, which is where the profession's technical core was built. Many others work in general insurance, superannuation and investments, health, enterprise risk, consulting, banking, government and regulation. Data science, climate and cyber sit across those areas rather than replacing them: a flood model is still a general-insurance problem; a mortality-improvement model is still a life and super problem. The mathematics travels. The institutional facts do not.

## 1.2 Where the work sits

The same EPV machinery is used in quite different rooms. What changes is who the client is, what "enough" means, and which statutory name sits on the advice.

| Setting | Who is being advised | What "enough" means | Typical constraint |
|---|---|---|---|
| Life office | Board; Appointed Actuary; product | Premiums and provisions that keep promises already sold, on a stated basis. | APRA capital; policy terms; reinsurance. |
| General insurer | Board; pricing and reserving teams | A rate that can be filed and a reserve that can run off. | Catastrophe dependence; IBNR; affordability. |
| Super fund | Trustee; members via the trustee | Member outcomes, insurance-in-super design, DB funding if any. | Covenant of the trustee; SG and tax rules; APRA member-outcomes standards. |
| Private health | Insurer; regulator via premium filing | A community-rated premium that does not unravel the pool. | Community rating; risk equalisation; rebate settings. |
| Consulting | A named client: insurer, fund, employer, government | Advice a decision maker can use, with assumptions visible. | Engagement letter; conflicts; the Code still applies. |
| Regulator / public sector | The Crown, a scheme, or the public | A number that can be defended in public and in statute. | Fiscal and distributional constraints, not a profit target. |
| Banking / credit | Credit and market-risk committees | Capital and a price for default, prepayment and interest-rate risk. | Credit models; liquidity; conduct of lending. |

The Associate designation (AIAA) marks a member who has completed the Institute's associate-level education and is bound by the Code. The Fellow designation (FIAA) is the fully qualified professional mark and is what statute and employers typically mean by "a qualified actuary" for Appointed Actuary and similar roles. CERA is an additional enterprise-risk credential sitting on top of the actuarial qualification, not a replacement for it. None of those letters is a licence to work outside one's competence: a newly qualified Fellow who has never seen a claims triangle is not, by the letters alone, ready to sign a GI reserve.

## 1.3 Professionalism is not a separate chapter

A profession is a bargain. The public grants a measure of trust – and, in insurance and superannuation, statute grants named roles such as the Appointed Actuary – on the condition that members hold a standard of conduct that an ordinary commercial employee is not asked to hold. The Actuaries Institute's Code of Conduct is principles-based (in force in that form from 2020) and applies to members in all aspects of their lives, not only when they are signing a statutory report. It is not a substitute for the law, and it is not a courtesy manual.