UNIVERSITY OF PRETORIA
DEPARTMENT OF ACTUARIAL SCIENCE
SUBJECT: IAS382 – SURVIVAL MODELS
PRACTICAL ASSIGNMENT
2025

Due date:	29 September 2025
Maximum marks:	30
Pages:	3
Examiner:	Luke Leatherbarrow

Instructions to candidates:

1. This is an **individual** assignment and should not be completed in a group setting.
2. Students should submit their own work **without** any third party assistance. **Students will be subjected to disciplinary procedures for submitting work that is not their own.**
3. Only Microsoft Excel may be used for calculations.
4. Include assumptions, workings, calculations and results in the Excel Workbook provided (IAS 382 Practical Assignment – 2025 – StudentNum.xlsb).
5. Ensure that you rename your Excel Workbook to include your student number.
6. Ensure that you include your student number in every sheet in the Excel Workbook.
7. Ensure that you submit your Excel Workbook and **Declaration of Originality** on ClickUP. No marks will be awarded to assignments where the declaration is missing.

IAS 382 – Practical Assignment – 2025

You have been tasked with performing a lapse experience investigation to aid the assumption setting process. This is a large product, and hence it is crucial that the lapse assumption is appropriate for the upcoming valuation.

The experience investigation is based on data from 01/01/2015 until 31/12/2024. The cash flow model requires, as input, monthly lapse rates for the first year, and annual lapse rates thereafter.

You have received the necessary ten years of past experience, for this particular product, to perform the experience investigation. More specifically, you have received:

- Monthly lapse data (in counts) for all ten years.
- Monthly claim/death data (in counts) for the first year, and annual data thereafter.
- Inception data for each past cohort (where each cohort would represent a past month).

You must assume a uniform distribution of deaths over any month or year, as well as a uniform distribution of individuals incepting within any month (i.e., individuals purchase this product, on average, halfway throughout the month). Additionally, assume that mortality and lapses are the only decrements considered.

Start by populating the table on the 'Policies_In-Force' sheet. This will provide a view of the book runoff over time (split by cohort / inception month).

[2]

Complete the sheet 'Calcs' in the Excel workbook provided, by answering the below questions.

(i) Explain four checks that you would perform on the data received. For each check, explain what the check would calculate or test for, what a favourable or unfavourable outcome would be, and why this check is needed.
Note that there is no requirement to carry out the checks suggested

[6]

(ii) Calculate the crude lapse rates for this product. Guidelines:

a) Group the lapse data according to inception year
b) Group the death data according to inception year
c) Group the policy inception / in-force data according to inception year
d) Using (a), (b) and (c), determine the exposure at each policy duration / month, according to inception year.
e) Calculate the crude lapse rates applying the principle of correspondence

[12]

(iii) Calculate the average lapse rate, for each duration, over the last ten years, the last five years and the last 3 years. Comment on why it is sometimes preferred to have a longer period to base the current assumption, and other times not.

[4]

(iv) Using an appropriate graph, and the lapse rates calculated over the last ten years, show how the lapse assumption changes over policy durations. Comment on the general form of the graph, and conclude as to whether or not you think this pattern is reasonable.
Hint: This is best shown at a monthly level – even beyond the first year.

[6]

[Total 30]