



Institute
and Faculty
of Actuaries

A Guide to CM1 and CM2 Examinations

for the 2021 examinations

March 2021

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Introduction to Actuarial Mathematics (CM1 and CM2)

This guide should help answer your questions about CM1 and CM2, including:

- the format of the online examinations;
- guidance on how to take the examinations;
- administrative information

If you have any further questions that are not covered in this guide, please contact the Education Services Team: education.services@actuaries.org.uk

Past papers for CM1 and CM2 examinations are available on the IFoA website:

<https://www.actuaries.org.uk/studying/prepare-your-exams/past-exam-papers-and-examiners-reports>

What is covered in CM1 and CM2?

Subjects CM1 and CM2 are a fundamental part of the Core Principles subjects.

CM1 provides a grounding in the principles of actuarial modelling, focusing on deterministic models and their application to financial products. It will equip you with the knowledge of:

- the basic principles of actuarial modelling,
- theories of interest rates and
- the mathematical techniques used to model and value cashflows which are either certain or are contingent on mortality, morbidity and/or survival.

CM2 provides a grounding in the principles of actuarial modelling, focusing on stochastic and asset liability models and the valuation of financial derivatives. It will equip you with the knowledge of:

- the theories of behaviour of financial markets,
- measures of risk,
- determining reserves for a non-life insurer and
- pricing options.

Subjects CM1 and CM2 include both theory and application of the ideas using Microsoft Excel.

How have CM1 and CM2 been developed?

CM1 and CM2 have been influenced by external direction and guidance: the Actuarial Profession Standards (APs), the International Standard of Actuarial Practice, the Actuaries' Code, the regulators, Sarbanes Oxley and Solvency II requirements. A summary of these are set out for reference below. While these subjects were taken into consideration when developing the syllabus for the Core Principles subjects, knowledge of these standards will not be directly tested in the CM1 and CM2 examinations.

- **Actuarial Profession Standards (APs)**

The latest standards can be found on the IFoA website:

<https://www.actuaries.org.uk/upholding-standards/standards-and-guidance/actuarial-standards-apss>

- **The Actuaries' Code**

The Actuaries Code can be found on the IFoA website:

<https://www.actuaries.org.uk/upholding-standards/standards-and-guidance/actuaries-code>

The Code requires us to “perform professional duties competently and with care” and to “ensure that their communication, whether written or oral, is clear...”.

- **International Standards of Actuarial Practice (ISAP)**

The latest ISAPs can be found on the International Actuarial Association's website:

<https://www.actuaries.org/iaa/IAA/Publications/ISAPs/IAA/Publications/05ISAPs.aspx?hkey=334b21a7-a3ac-4e0e-8294-3cbc755ab14a>

- **The regulators**

In reviewing a firm's practices, the regulators expect to see acceptable standards of documentation, agreed by the firm, and documented.

- **Sarbanes Oxley (SOX or SarBox)**

This is American legislation which governs the need for full documentation of internal processes and controls.

- **Solvency II**

This framework for insurance companies includes emphasis on documentation and evidencing of the calculation work undertaken.

The timing and format of the CM1 and CM2 examinations

Examination dates for the coming year can be found at:

<https://www.actuaries.org.uk/studying/exam-bookings/exam-dates-2020>

Details of the syllabus for CM1 and CM2 can be found at:

<https://www.actuaries.org.uk/studying/curriculum/actuarial-mathematics>

Questions for the CM1 examination and the CM2 examination will be drawn from across the syllabus.

Each of the CM1 and CM2 examinations consists of two elements, referred to as Paper 'A' and Paper 'B':

- Paper A: a 3hrs and 15mins written examination paper. This is delivered online and can be taken at your workplace or at home, at UK times only.
- Paper B: a 1hr and 45mins paper. This is a problem-based assessment delivered online, using Excel with questions requiring candidates to use data to answer questions. This is delivered online and can be taken at your workplace or at home, at UK times only.
- The two elements of each assessment will take place over two consecutive working days where possible. Where this is not possible, there will be no more than a two working day delay between sittings.
- When booking these two part examinations, your booking confirmation will show the date and time of your examinations. We will send joining instructions by email, including the link to the IFoA online exam platform, 2 weeks before your examination. Your joining instructions will include information on how to create and verify your details on the IFoA online exam platform and how to complete online exam platform equipment checks.

Note: With effect from the April 2019 reading time is included in the overall examination time. It is therefore up to candidates to manage their time between reading through the paper and starting to answer the questions. There is guidance on this at *Hints and Tips* at:

<https://www.actuaries.org.uk/studying/prepare-your-examinationinations/revision-programme>

For the 2021 examinations (April and September) you will need to have access to the following. It is suggested you ensure you have access prior to the examinations:

Examination	Version of Microsoft Excel required	Any other requirements
CM1A	Microsoft Office 2013 (Word)	
CM1B	Microsoft Office 2013 (Excel)	IFoA provided Excel answer workbook
CM2A	Microsoft Office 2013 (Word)	
CM2B	Microsoft Office 2013 (Excel)	IFoA provided Excel answer workbook

What examinations should I have passed before sitting CM1 and CM2?

Students do not have to pass any other examination prior to attempting CM1 or CM2. However, the syllabus for CM1 lists a number of foundation topics such as summarizing data sets, basic probability theory and random variables. These topics are assumed knowledge for CM1 and you may wish to ensure you are familiar with them before studying for CM1. Furthermore, because CM2 builds on many of the principles covered in CM1, you may wish to ensure you are familiar with the topics covered in CM1 before studying CM2.

Candidates are advised that Formulae and Tables books may be required for these assessments. Candidates may use their personal copies or you can purchase your copy through the e-shop at: <https://www.actuaries.org.uk/shop>

A soft copy of the Formulae and Tables can also be found in our [website](#).

I want to sit the examination. What do I need to do?

Information can be found on the IFoA website:

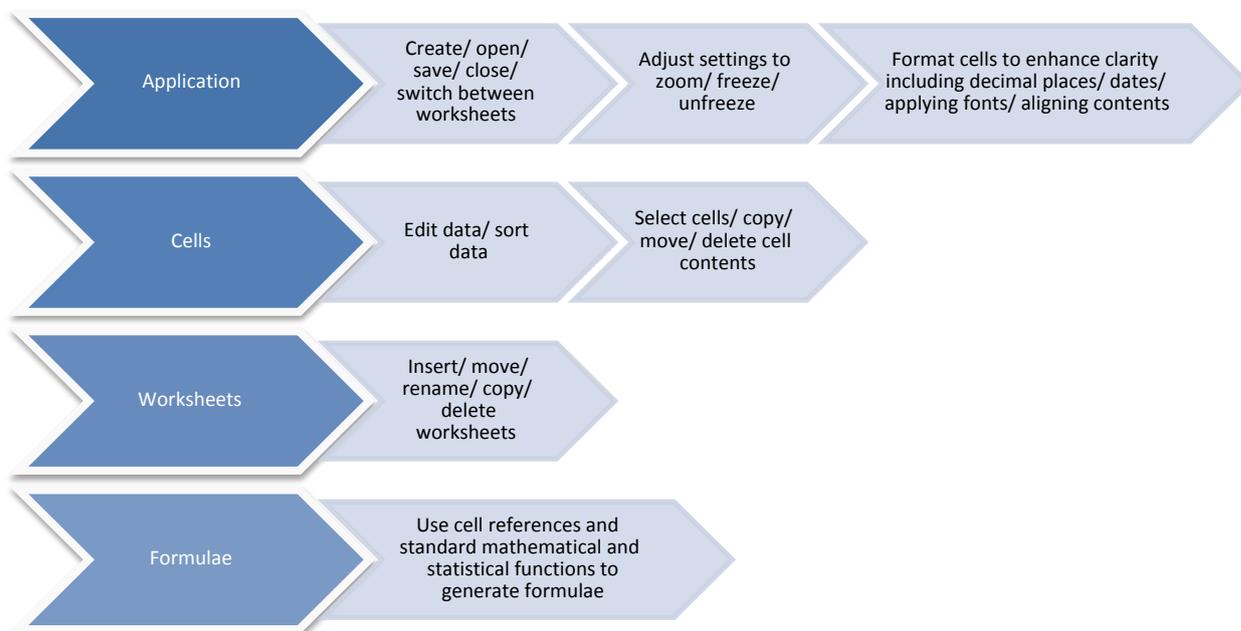
<https://www.actuaries.org.uk/studying/exam-bookings>

What should I know before sitting CM1 and CM2? Microsoft Word

Extensive knowledge of Word will not be necessary for this examination.

It is important to note that when completing the A examinations you may wish to use Excel to aid with calculations. It should be noted however that any calculations or Excel formulae you use must appear in full in your Word answer script to ensure you receive the appropriate marks. If you miss out any of the calculation steps or do not provide sufficient formulae or information for the examiners to assess how your answer was determined, then full marks may not be awarded.

Microsoft Excel



Extensive knowledge of Excel is not part of the examination. However, candidates will be expected to model calculations effectively using this software. Therefore, a CM1/CM2 candidate should have experience of using Excel.

Candidates who have limited experience or rarely have an opportunity to create spreadsheets are encouraged to practise before attending the examination; the sample exam assignments on the IFoA's website offer a good opportunity for such practice.

Exam assignments are constructed so as not to require advanced Excel techniques. However, candidates should be able to use the Excel functions listed below. Candidates are unlikely to be required, in any one examination, to use all of the functions listed here:

AVERAGE	SUM	COUNTIF	AND / OR
STDEV	PRODUCT	VLOOKUP /	NOT
MIN / MAX	SUMPRODUCT	HLOOKUP INDEX	ROUND
MEDIAN	SUMIF	OFFSET	ABS
LARGE / SMALL	COUNT	IF	INT
		GOALSEEK	

As well as the above built-in functions, candidates should know how to sort data and how to

create and modify charts.

Candidates should not use in-built employer Excel functions.

All calculations should be present in your exam submission.

There is any number of Excel reference books available in addition to the *Help* facility provided in Excel.

Candidates are recommended to look up the details of how to use the above features before the exam.

Files to download

At the beginning of the examination you will be required to download the following files:

- The question paper. This will be a single document in PDF format
- Answer workbook. These will be one or more files in Microsoft Excel format.

You will be required to input all your work in the answer workbook and save them using an appropriate naming convention.

The examination

You will be given one or more problems to model in Microsoft Excel. You do not need to include appropriate checks, unless instructed to do so, or an audit trail. However, your workings and all calculations must be set out and labelled clearly to enable the examiners to follow your approach.

On completion of the examination

Files to upload

At the end of the examination you will be required to upload the following files:

- Your Word document for paper A
- Your completed models for paper B. These will be a Microsoft Excel file.

Additional guidance (if required) will be included with the exam instructions to cover key technical or modelling aspects needed for the particular situation in the problem to be modelled.

Final grading

The CM examinations will assess a candidate's overall performance over both papers. A Candidate, therefore, does not have to produce a pass standard for each separate paper, but does need to demonstrate a pass standard overall. Marks for the two elements of assessment for CM1 and CM2 will be combined and a single mark awarded for each subject.