

Subject F105

2021 Study Guide

Introduction

This Study Guide has been created to help guide you navigate your way through Subject F105. It contains all the information you will need before starting to study Subject F105 for the 2021 exams and you may also find it useful to refer to throughout your Subject F105 journey.

The guide is split into two parts:

- Part 1 contains specific information about Subject F105
- Part 2 contains general information about the Fellowship Principles subjects

Please read this Study Guide carefully before reading the Course Notes, even if you have studied for some actuarial exams before. While you may have already read (the majority of) the Part 2 material in previous subjects, the information in Part 1 is unique to this course.

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1.1 Subject F105 – background and contents

Links to other subjects

- Subject A112 – Business Economics
- Subject A113 – Business Finance
- Subject A214 – Financial Engineering and Loss Reserving
- Subject A311 – Actuarial Risk Management
- Subject F205 – Finance and Investment Applications

Contents

There are six parts to the Subject F105 course. The parts cover related topics and are broken down into chapters. At the end of each part there is an assignment testing the material from that part.

The following table shows how the parts and chapters relate to each other. The final column shows how the chapters relate to the X Assignments. We have also given you a broad indication of the length of each chapter. This table should help you plan your progress across the study session.

| Part | Chapter | Title | No of pages | X Assignment |
|-------------|----------------|--|--------------------|---------------------|
| 1 | 1 | Introduction to Subject F105 | 7 | X1 |
| | 2 | Derivatives (1) | 23 | |
| | 3 | Derivatives (2) | 25 | |
| | 4 | Specialist asset classes (1) | 45 | |
| | 5 | Specialist asset classes (2) | 68 | |
| | 6 | Economic influences | 25 | |
| 2 | 7 | The theory of finance | 42 | X2 |
| | 8 | Regulation of financial services | 15 | |
| | 9 | Applications of the legislative and regulatory framework (1) | 30 | |
| | 10 | Applications of the legislative and regulatory framework (2) | 25 | |
| 3 | 11 | Fundamental share analysis | 30 | X3 |
| | 12 | Valuation of investments (1) | 43 | |
| | 13 | Valuation of investments (2) | 45 | |
| 4 | 14 | Industry classification | 20 | X4 |
| | 15 | Investment indices | 46 | |
| | 16 | Performance measurement (1) | 51 | |
| | 17 | Performance measurement (2) | 23 | |
| 5 | 18 | Overall risk control | 28 | X5 |
| | 19 | Actuarial techniques (1) | 20 | |
| | 20 | Actuarial techniques (2) | 20 | |
| | 21 | Portfolio management (1) | 39 | |
| 6 | 22 | Portfolio management (2) | 36 | X6 |
| | 23 | Portfolio management (3) | 45 | |
| | 24 | Taxation | 17 | |
| | 25 | Solving problems | 9 | |
| | 26 | Glossary | 13 | |

1.2 Subject F105 – Syllabus and Core Reading

Syllabus

The Syllabus for Subject F105 is given here. To the right of each objective are the chapter numbers in which the objective is covered in the F105 notes.

Aim

The aim of this Finance and Investment Principles subject is to instil in successful candidates the ability to apply, in simple situations, the principles of actuarial planning and control to the appraisal of investments, and to the selection and management of investments appropriate to the needs of investors.

Links to other subjects

This subject draws on the issues introduced in Subjects A113 — Business Finance, A112 — Business Economics and A214 — Financial Engineering and Loss Reserving.

Subject A311 — Actuarial Risk Management: covers the general underlying principles affecting all specialisms.

Subject F205— Finance and Investment Applications: use the principles in this subject to solve complex problems, to produce coherent advice and recommendations within a specifically South African context.

Objectives

On completion of this subject the candidate will be able to:

- (a) State what is meant by a risk-free rate of return, and describe assets that may be assumed to be risk-free in practical work. (Chapter 18)
- (b) Describe the typical ways in which investment returns are taxed and the effect of the taxation basis on investor behaviour. (Chapter 24)
- (c) Demonstrate knowledge of the influences over the commercial and economic environment from: (Chapter 6)
 - central banks
 - main investor classes
 - government policy.
- (d) Demonstrate a knowledge of the principles of fundamental analysis of equities and bonds. (Chapter 11)

- (e) Apply appropriate methods for the valuation of individual investments and demonstrate an understanding of their appropriateness in different situations. (Chapters 12 and 13)
- fixed income analytics and valuation (including interest rate swaps and futures)
 - arbitrage pricing and the concept of hedging
 - empirical characteristics of asset prices
 - introduction into fixed income option pricing
 - evaluating a securitisation (including CBOs and MBSs)
 - evaluation of a credit derivative.
- (f) Describe methods by which an institution can monitor and control its exposure to the following types of risk: (Chapter 18)
- asset-liability mismatching risk
 - market risk
 - credit risk
 - operational risk
 - liquidity risk
 - relative performance risk
- and explain in the context of mean-variance portfolio theory what is meant by:
- opportunity set
 - efficient frontier
 - indifference curves
 - the optimum portfolio.
- (g) (i) Describe the principles and aims of market conduct regulatory regimes. (Chapter 8)
- (ii) Demonstrate knowledge of the principles underlying the legislative and regulatory framework for investment management and the securities industry. (Chapter 8)

- (iii) Demonstrate how these principles can be applied in the areas of:
(Chapters 9 and 10)
- trust law
 - corporate governance
 - role of the listings authority
 - environmental and ethical issues
 - competition and fair trading controls
 - monopolies regulators
 - investment restrictions in investment agreements
 - provision of financial services
 - institutional investment practices
 - role and responsibilities of directors
 - development of international accounting standards
- (h) Demonstrate a knowledge and understanding of the theory of finance. (Chapter 7)
- (i) Discuss the relationship between financial management and acting as an entrepreneur.
- (ii) Outline the possible motives for mergers and divestitures.
- (iii) Discuss the key findings in behavioural finance.
- (iv) Outline the main steps involved in financial planning.

- (i) Demonstrate a knowledge and understanding of the characteristics of specialist financial instruments: (Chapters 4 and 5)
- financial instruments available for short-term lending and borrowing
 - corporate debt and credit derivatives
 - swaps and swaptions
 - private debt
 - asset-backed securities, securitisation
 - venture capital
 - hedge funds
 - currency
 - infrastructure
 - commodities
 - structured products
 - new ways of investing in old asset classes
- (j) Describe the main types of derivative contract, how they are traded, and define their payoffs. (Chapters 2 and 3)
- (k) Show how actuarial techniques may be used to develop an appropriate investment strategy. (Chapter 19 and 20)
- asset pricing models
 - asset / liability modelling
 - asset / liability mismatch reserving
 - credit rating an entity
 - liability hedging
 - dynamic liability benchmarks
- (l) Analyse the performance of an investment and discuss the limitations of such measurement techniques. (Chapter 17)
- portfolio risk and return analysis
 - equity price
 - net present value
 - net asset value
 - return on capital

- (m) Describe the construction of investment indices and the principal features of major investment indices. (Chapter 15)
- (i) Discuss the uses of investment indices.
 - (ii) Describe the principal indices of share prices in the South African, United Kingdom, United States, Japanese, German and French stock markets.
 - (iii) Describe the principal bond indices (South African and global).
 - (iv) Explain the problems encountered in constructing property indices.
- (n) Analyse the performance of an investment portfolio and discuss the limitations of such portfolio measurement. (Chapter 16)
- (i) Assess the performance of a portfolio relative to a published market index.
 - (ii) Assess the performance of a portfolio relative to a predetermined bench-mark portfolio.
 - (iii) Analyse the performance of a portfolio into components relating to investment sector selection and individual stock selection.
 - (iv) Discuss the relative merits of assessing portfolio performance relative to published indices, other portfolios or a predetermined bench-mark portfolio.
 - (v) Discuss the uses of risk adjusted performance measures.
 - (vi) Discuss the value of portfolio performance measurement and its limitations.
- (o) Demonstrate a knowledge and understanding of the principal techniques in portfolio management including risk control techniques.
- (i) Describe and discuss the principal active management “styles” (value, growth, momentum, rotational). (Chapter 21)
 - (ii) Discuss the principal equity portfolio management techniques. (Chapter 21)
 - (iii) Discuss the principal bond portfolio management techniques. (Chapter 21)
 - (iv) Discuss the uses which an institutional investor might make of financial futures and options, including over the counter contracts. (Chapter 23)
 - (v) Discuss the uses which an institutional investor might make of interest rate and currency swaps. (Chapter 23)
 - (vi) Discuss the uses which an institutional investor might make of forward foreign exchange contracts for currency hedging. (Chapter 23)
 - (vii) Discuss the usefulness of multifactor models in practical investment management and risk control. (Chapter 22)

- (viii) Discuss the problems of making significant changes to the investment allocation of a substantial portfolio. (Chapter 23)
- (ix) Discuss transition management and asset allocation techniques (including overlay strategies). (Chapter 23)
- (x) Discuss the role of the custodian. (Chapter 22)
- (xi) Discuss portfolio construction with attention to: (Chapter 22)
 - value at risk
 - tracking error
 - risk budgets
- (xii) Discuss measurement, comparison and attribution of risk. (Chapter 22)

Accreditation

The Institute and Faculty of Actuaries and Actuarial Society of South Africa would like to thank the numerous people who have helped in the development of the material contained in this Core Reading.

The following sources have been consulted in developing the Core Reading:

Asset pricing. Cochrane, J. H. Rev. ed. and earlier Princeton University Press, 2005.
ISBN: 978-0691121376

Principles of corporate finance. Brealey, R. A.; Myers, S. C.; Allen, F. 10th ed. and earlier McGraw-Hill, 2010.
ISBN: 978-0071314176

The monetary and financial system. Goacher, D. 4th ed. Chartered Institute of Banking, 1999.
ISBN: 978-0852975404

Options, futures and other derivatives. Hull, J. C. 8th ed. and earlier. Pearson Education, 2011.
ISBN: 978-0273759116

Understanding infrastructure investments. Mackay-Fisher, K. CEO Forum Group, 2003.

Further reading

The exam will be based on the relevant F105 Syllabus and F105 notes, which will be the main source of tuition for students.

1.3 Subject F105 – skills and assessment

Exam skills

Exam question skill levels

In the Fellowship Principles subjects, the approximate split of assessment across the three skill types is:

- Knowledge – 25%
- Application – 50%
- Higher Order skills – 25%.

Assessment

The Fellowship Principles examinations are in the form of 3¼-hour examinations (3 hours plus 15 minutes reading time).

1.4 Subject F105 – frequently asked questions

Q: *What knowledge of earlier subjects should I have?*

A: This is answered in Chapter 1 of the Course Notes.

Q: *How technical is the F105 course?*

A: Although largely a discursive course, F105 does contain some technical material relating to the valuation of interest rate derivatives (in Chapters 12 and 13). You are generally not required to know the derivations of the valuation formulae, but you may be required to apply the formulae. In addition, there are a number of other less technical areas that offer some scope for numerical questions, *eg* indices and performance measurement.

Q: *What should I do if I discover an error in the course?*

A: If you find an error in the course, please check our website at:

www.ActEd.co.uk/paper_corrections.html

to see if the correction has already been dealt with. Otherwise please send details via email to **SP5@bpp.com** and / or **courses@actuarialsociety.org.za**.

Q: *Who should I send feedback to?*

A: We are always happy to receive feedback from students, particularly details concerning any errors, contradictions or unclear statements in the courses.

If you have any comments on this course in general, please email to **SP5@bpp.com** and / or **courses@actuarialsociety.org.za**.

If you have any comments or concerns about the F105 Syllabus or other F105-specific issues please email **courses@actuarialsociety.org.za**.

2.1 Before you start

When studying for the ASSA's exams, you will need:

- a copy of the **Formulae and Tables for Examinations of the Faculty of Actuaries and the Institute of Actuaries, 2nd Edition (2002)** – these are referred to simply as the *Tables*
- a **'permitted' calculator** – you will find the list of permitted calculators on ASSA's website. Please check this list carefully, since it is reviewed each year.

2.2 Core study material

This section explains the role of the Syllabus and Core Reading. It also gives guidance on how to use these materials most effectively in order to pass the exam.

Syllabus

The Syllabus for Subject F105 has been produced by the Actuarial Society of South Africa, and it is very similar (but not the same as) the syllabus for the UK's Institute and Faculty of Actuaries Subject SP5. The relevant individual Syllabus Objectives are included at the start of each course chapter and a complete copy of the Syllabus is included in Section 2.2 of this Study Guide. We recommend that you use the Syllabus as an important part of your study.

F105 Course Notes

Subject F105 course notes include the most of the UK Profession's Core Reading for Subject SP5 as well as additional supplementary text. Please note that both the Core Reading and the supplementary text are examinable for the Subject F105 exam.

Core Reading

The Core Reading supports coverage of the Syllabus in helping to ensure that both depth and breadth are re-enforced.

The examinations require students to demonstrate their understanding of the concepts given in the syllabus and described in the Core Reading; this will be based on legislation, professional guidance *etc* that are in force when the Core Reading is published, *ie* on 31 May in the year preceding the examinations.

Therefore the exams in April and September 2021 will be based on the Syllabus and Core Reading as at 31 May 2020. We recommend that you always use the up-to-date Core Reading to prepare for the exams.

The Core Reading will be updated each year to reflect changes in the syllabus and current practice, and in the interests of clarity.

Core Reading is shown in a bold font.

Supplementary text

Supplementary text has been written, most by ActEd, to enhance the notes by providing examples and further explanation of key points. This supplementary text is not in bold font. Here is an excerpt from some ActEd Course Notes to show you how to identify Core Reading and the supplementary text.

In the example given above, the index *will* fall if the actual share price goes below the theoretical ex-rights share price. Again, this is consistent with what would happen to an underlying portfolio.

After allowing for chain-linking, **the formula for the investment index then becomes:**

$$I(t) = \frac{\sum_i N_{i,t} P_{i,t}}{B(t)}$$

where $N_{i,t}$ is the number of shares issued for the i th constituent at time t ;

$B(t)$ is the base value, or divisor, at time t .

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Reading

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Legal action will be taken if these terms are infringed. In addition, we may seek to take disciplinary action through the Institute and Faculty of Actuaries or through your employer.

These conditions remain in force after you have finished using the course.

2.3 Study skills and assessment

The Subject F100 exams

It is important to recognise that the F100 subject exams are very different from the earlier subject exams in both the nature of the material covered and the skills being examined.

Both the Core Reading and the exam papers themselves are generally much less numerical and more 'wordy' than the earlier subjects. The exam will primarily require you to explain a particular point in words and sentences, rather than to manipulate formulae or do calculations. Numerical questions typically account for only a small part of each exam paper. If you haven't sat this type of exam for some time, you need to start practising again now. Many students find that it takes time to adjust to the different style of the F100 subject exam questions. As ever, practice is the key to success.

The aim of the exams is to test your ability to apply your knowledge and understanding of the key principles described in the Core Reading to specific situations presented to you in the form of exam questions. Therefore your aim should be to identify and understand the key principles, and then to practise applying them. You will also need a good knowledge of the Core Reading and supplementary text to score well and quickly on any bookwork questions.

Study skills

Overall study plan

We suggest that you develop a realistic study plan, building in time for relaxation and allowing some time for contingencies. Be aware of busy times at work, when you may not be able to take as much study leave as you would like. Once you have set your plan, be determined to stick to it. You don't have to be too prescriptive at this stage about what precisely you do on each study day. The main thing is to be clear that you will cover all the important activities in an appropriate manner and leave plenty of time for revision and question practice.

Aim to manage your study so as to allow plenty of time for the concepts you meet in this course to 'bed down' in your mind. Most successful students will probably aim to complete the course at least six weeks before the exam, thereby leaving a sufficient amount of time for revision. By finishing the course as quickly as possible, you will have a much clearer view of the *big picture*. It will also allow you to structure your revision so that you can concentrate on the important and difficult areas of the course.

You can also try looking at the Subject SP5 discussion forum, which can be accessed at www.ActEd.co.uk/forums (or use the link from our home page at www.ActEd.co.uk). There are some good suggestions from students on how to study.

Study sessions

Only do activities that will increase your chance of passing. Try to avoid including activities for the sake of it and don't spend time reviewing material that you already understand. You will only improve your chances of passing the exam by getting on top of the material that you currently find difficult.

In particular, you may already be familiar with the content of some of the chapters (from earlier subjects). Try to cover these chapters quickly to give yourself more time on the material with which you are less comfortable. Where chapters refer back to material from the earlier subjects, you don't have to follow these links up unless you are feeling curious or clueless.

Ideally, each study session should have a specific purpose and be based on a specific task, *eg 'Finish reading Chapter 3 and attempt Practice Questions 3.4, 3.7 and 3.12'*, as opposed to a specific amount of time, *eg 'Three hours studying the material in Chapter 3'*.

Try to study somewhere quiet and free from distractions (*eg* a library or a desk at home dedicated to study). Find out when you operate at your peak, and endeavour to study at those times of the day. This might be between *8am* and *10am* or could be in the evening. Take short breaks during your study to remain focused – it's definitely time for a short break if you find that your brain is tired and that your concentration has started to drift from the information in front of you.

Order of study

We suggest that you work through each of the chapters in turn. To get the maximum benefit from each chapter you should proceed in the following order:

1. Read the syllabus objectives. These are set out in the box at the start of each chapter.
2. Read the Chapter Summary at the end of each chapter. This will give you a useful overview of the material that you are about to study and help you to appreciate the context of the ideas that you meet.
3. Study the Course Notes in detail, annotating them and possibly making your own notes. Try the self-assessment questions as you come to them. As you study, pay particular attention to the listing of the syllabus objectives and to the Core Reading.
4. Read the Chapter Summary again carefully. If there are any ideas that you can't remember covering in the Course Notes, read the relevant section of the notes again to refresh your memory.
5. Attempt (at least some of) the Practice Questions that appear at the end of the chapter.

It's a fact that people are more likely to remember something if they review it several times. So, do look over the chapters you have studied so far from time to time. It is useful to re-read the Chapter Summaries or to try the Practice Questions again a few days after reading the chapter itself. It's a good idea to annotate the questions with details of when you attempted each one. This makes it easier to ensure that you try all of the questions as part of your revision without repeating any that you got right first time.

Once you've read the relevant part of the notes and tried a selection of questions from the Practice Questions (and attended a tutorial, if appropriate) you should attempt the corresponding assignment. If you submit your assignment for marking, spend some time looking through it carefully when it is returned. It can seem a bit depressing to analyse the errors you made, but you will increase your chances of passing the exam by learning from your mistakes. The markers will try their best to provide practical comments to help you to improve.

To be really prepared for the exam, you should not only know and understand the Core Reading but also be aware of what the examiners will expect. Your revision programme should include plenty of question practice so that you are aware of the typical style, content and marking structure of exam questions. You should attempt as many past exam questions as you can.

Active study

Here are some techniques that may help you to study actively.

1. Don't believe everything you read. Good students tend to question everything that they read. They will ask 'why, how, what for, when?' when confronted with a new concept, and they will apply their own judgement. This contrasts with those who unquestioningly believe what they are told, learn it thoroughly, and reproduce it (unquestioningly?) in response to exam questions.
2. Another useful technique as you read the Course Notes is to think of possible questions that the examiners could ask. This will help you to understand the examiners' point of view and should mean that there are fewer nasty surprises in the exam room. Use the Syllabus to help you make up questions.
3. Annotate your notes with your own ideas and questions. This will make you study more actively and will help when you come to review and revise the material. Do not simply copy out the notes without thinking about the issues.
4. As you study each chapter, condense the *key* points (not whole chunks of text) on to a double side of A4 or less. This is essential as otherwise, when you come to revision, you will end up having to re-read the whole course again, and there won't be time.
5. Try to use memory aids, such as mind maps and acronyms, to help remember the material when you come back to it later.
6. Attempt the questions in the notes as you work through the course. Write down your answer before you refer to the solution.

7. Attempt other questions and assignments on a similar basis, *ie* write down your answer before looking at the solution provided. Attempting the assignments under exam conditions has some particular benefits:
 - It forces you to think and act in a way that is similar to how you will behave in the exam.
 - When you have your assignments marked it is *much* more useful if the marker's comments can show you how to improve your performance under exam conditions than your performance when you have access to the notes and are under no time pressure.
 - The knowledge that you are going to do an assignment under exam conditions and then submit it (however good or bad) for marking can act as a powerful incentive to make you study each part as well as possible.
 - It is also quicker than trying to write perfect answers.
8. Sit a mock exam four to six weeks before the real exam to identify your weaknesses and work to improve them. You could use a mock exam written by ActEd or a past exam paper.

You can find further information on how to study in the ASSA's Student Handbook, which you can download from their website at:

<https://www.actuarialsociety.org.za/student-zone/>

Revision and exam skills

Revision skills

You will have sat many exams before and will have mastered the exam and revision techniques that suit you. However it is important to note that due to the high volume of work involved in Subject F105, it is not possible to leave all your revision to the last minute. Students who prepare well in advance have a better chance of passing the exam on the first sitting.

We recommend that you prepare for the exam by practising a large number of exam-style questions under exam conditions. This will:

- help you to develop the necessary knowledge and understanding of the key principles described in the Core Reading and supplementary text
- highlight exactly which are the key principles that crop up time and time again in many different contexts and questions
- help you to practise the specific skills that you will need to pass the exam.

Exam question skill levels

Exam questions are not designed to be of similar difficulty. The Actuarial Society of South Africa specifies different skill levels at which questions may be set.

Questions may be set at any skill level:

- Knowledge – demonstration of a detailed knowledge and understanding of the topic
- Application – demonstration of an ability to apply the principles underlying the topic within a given context
- Higher Order – demonstration of an ability to perform deeper analysis and assessment of situations, including forming judgements, taking into account different points of view, comparing and contrasting situations, suggesting possible solutions and actions, and making recommendations.

Past exam papers

You can download some past exam papers and Examiners' Reports from the ASSA's website at www.actuarialsociety.org.za.

The examination

IMPORTANT NOTE: The following information was correct at the time of printing, however it is important to keep up-to-date with any changes. See the profession's website for the latest guidance.

For the exam, the examination room will be equipped with:

- the question paper
- an answer booklet
- rough paper
- a copy of the *Tables*
- * access to a computer (for typed answers).

Remember to take with you:

- black pens
- an authorised scientific calculator – please refer to www.actuarialsociety.org.za for the latest advice.

2.4 Queries and feedback

Questions and queries

From time to time you may come across something in the study material that is unclear to you. The easiest way to solve such problems is often through discussion with friends, colleagues and peers – they will probably have had similar experiences whilst studying. If there's no-one at work to talk to then use our discussion forum at www.ActEd.co.uk/forums (or use the link from our home page at www.ActEd.co.uk).

Our online forum is dedicated to actuarial students so that you can get help from fellow students on any aspect of your studies from technical issues to study advice. You could also use it to get ideas for revision or for further reading around the subject that you are studying. ActEd tutors will visit the site from time to time to ensure that you are not being led astray and we also post other frequently asked questions from students on the forum as they arise.

If you are still stuck, then you can send queries by email to the relevant subject email address (see Section 1.4), but we recommend that you try the forum first. We will endeavour to contact you as soon as possible after receiving your query but you should be aware that it may take some time to reply to queries, particularly when tutors are away from the office running tutorials. At the busiest teaching times of year, it may take us more than a week to get back to you.

Feedback

If you find an error in the course, please check the corrections page of our website (www.ActEd.co.uk/paper_corrections.html) to see if the correction has already been dealt with. Otherwise please send details via email to the relevant subject email address (see Section 1.4).

Each year our tutors work hard to improve the quality of the study material and to ensure that the courses are as clear as possible and free from errors. We are always happy to receive feedback from students, particularly details concerning any errors, contradictions or unclear statements in the courses. If you have any comments on this course please email them to the relevant subject email address (see Section 1.4).