

Subject SP6

2021 Study Guide

Introduction

This Study Guide has been created to help you navigate your way through Subject SP6. It contains all the information you will need before starting to study Subject SP6 for the 2021 exams and you may also find it useful to refer to throughout your Subject SP6 journey.

The guide is split into two parts:

- Part 1 contains specific information about Subject SP6.
- Part 2 contains general information about the Specialist 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 SP6 – background and contents

History

The Specialist Principles subjects are new subjects in the Institute and Faculty of Actuaries 2021 Curriculum.

Subject SP6 is Derivatives

Predecessors

The Specialist Principles subjects cover content that was previously in the equivalent Specialist Technical subjects. So:

- Subject SP6 replaced Subject ST6.

Exemptions

You will need to have passed or been granted an exemption from Subject ST6 to be eligible for a pass in Subject SP6 during the transfer process.

Links to other subjects

- CM2 – Actuarial Mathematics 2
- CP1 – Actuarial Practice

Contents

There are six parts to the Subject SP6 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 days of the regular tutorials. This table should help you plan your progress across the study session.

Part	Chapter	Title	No of pages	Tutorials 3 full days
1	1	Background to derivatives	22	1
	2	Forwards and futures	53	
	3	Traded derivatives contracts	29	
2	4	Binomial trees	60	
	5	Stochastic calculus	69	
3	6	Probability measures and risk-neutral pricing	57	
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1.2 Subject SP6 – Syllabus and Core Reading

Syllabus

The Syllabus for Subject SP6 is given here. To the right of each objective are the chapter numbers in which the objective is covered in the ActEd course.

Aim

The aim of the Financial Derivatives Principles subject is to instil in successful candidates the ability (at a higher level of detail and ability than in CM2) to understand different types of financial derivatives and their uses, the markets in which they are traded, methods of valuation of financial derivatives, and the assessment and management of risks associated with a portfolio of derivatives.

Competences

On successful completion of this subject, a student will be able to:

- 1 understand the main principles and techniques that are relevant to the use and management of financial derivatives.
- 2 apply these principles to given situations within the context of financial derivative management.
- 3 analyse hypothetical scenarios, including using judgement to assess the implications of possible actions and to develop appropriate proposals or recommendations relating to the management of financial derivatives.

Syllabus topics

1	Derivative markets	(5%)
2	Derivative types and uses	(20%)
3	Derivative pricing and valuation methods, including interest rate models	(50%)
4	Management of derivatives	(25%)

These weightings are indicative of the approximate balance of the assessment of this subject between the main syllabus topics, averaged over a number of examination sessions.

The weightings also have a correspondence with the amount of learning material underlying each syllabus topic. However, this will also reflect aspects such as:

- the relative complexity of each topic, and hence the amount of explanation and support required for it.
- the need to provide thorough foundation understanding on which to build the other objectives.
- the extent of prior knowledge which is expected.
- the degree to which each topic area is more knowledge or application based.

Detailed syllabus objectives

1 Derivative markets (5%)

- 1.1 Demonstrate an awareness of the basic characteristics of the derivatives markets.
- 1.2 Describe the characteristics of exchange traded contracts and over-the-counter contracts.
- 1.3 Describe the uses of forwards, future and options by different types of traders: hedgers, speculators and arbitrageurs.
- 1.4 Demonstrate an understanding of how futures and options markets work.
- 1.5 Describe the operation of central counterparty clearing houses (CCPs) and the related regulatory environment.

2 Derivative types and uses (20%)

- 2.1 Describe the payoffs of forwards and futures, calls and puts (American and European).
- 2.2 Demonstrate an understanding of forward and futures prices.
- 2.3 Explain how to use the futures contracts in 2.2 for hedging.
- 2.4 Describe the following traded derivative contracts:
 - stock options
 - currency options
 - index options
 - options on futures
 - warrants
 - convertibles
- 2.5 Describe different types of property derivatives, including their uses, and property indices.

2.6 Describe the following interest rates and interest rate derivatives:

- Treasury rates
- LIBOR rates
- repo rates
- zero rates
- forward rates
- forward rate agreements
- interest rate futures
- Treasury bond futures
- interest rate swaps
- European swap options (swaptions)
- caps and caplets
- floors and floorlets
- Bermudan swaptions

2.7 Describe the following exotic equity and foreign exchange derivatives:

- quanto options
- chooser options
- barrier options
- binary options
- lookback options
- Asian options
- exchange options
- basket options

2.8 Describe the following structured securities and over-the-counter (OTC) contracts, including how each can be used to hedge certain types of liability:

- STRIPS
- Interest rate swaps
- Interest rate swaptions
- Index-linked bonds
- Inflation swaps
- Limited Price Indexation (LPI) swaps
- LPI bonds

2.9 Describe how non-economic risks such as longevity risk can be hedged using suitable structured securities and OTC contracts.

2.10 Demonstrate a knowledge and understanding of credit derivatives and their application.

2.10.1 Describe the following types of credit derivative:

- credit default swaps (CDSs)
- collateralised debt obligations (CDOs)
- nth to default baskets
- total return swaps

2.10.2 Explain the relationship between CDSs and corporate bonds, in particular as shown by their relative credit spreads.

2.10.3 Describe the uses of credit derivatives.

3 Derivative pricing and valuation methods, including interest rate models (50%)

3.1 Describe how the following factors affect option prices:

- stock price
- strike price
- term to expiry
- volatility
- risk-free rate
- dividends

- 3.2 Demonstrate the theory underpinning the determination of derivative prices and hedging strategies using the binomial model, including:
- sample paths.
 - filtrations.
 - the Binomial Representation Theorem.
 - conditional expectations.
 - previsible process.
 - self-financing portfolio strategies.
 - replicating strategies.
 - pricing under the martingale measure.
- 3.3 Demonstrate the theory underpinning the determination of derivative prices and hedging strategies using the Black-Scholes model, including:
- Brownian motion.
 - Itô calculus.
 - Itô's Lemma.
 - statement of the Cameron-Martin-Girsanov Theorem.
 - the concept of the Radon-Nikodym derivative.
 - change of measure.
 - statements of the Martingale Representation Theorem.
 - continuous-time portfolio strategies.
 - self-financing portfolios in continuous time.
 - the Black-Scholes model.
 - construction of replicating strategies using the martingale approach.
 - the Black-Scholes formula for non-dividend-paying stocks.
- 3.4 Demonstrate more advanced application of the Black-Scholes model in the determination of derivative prices.
- 3.4.1 Demonstrate how to adapt the martingale approach to the pricing of foreign-exchange options and options on stock indices paying dividends continuously.
- 3.4.2 Derive the Black-Scholes-Merton partial differential equation.
- 3.4.3 Explain the role of the market price of risk in the transfer between the real-world and the risk-neutral probability measures.

- 3.4.4 Demonstrate the role of the volatility parameter in the valuation of options, including:
- calculation of implied volatility from option prices.
 - estimation of volatility from historical time series or other market indices (e.g. the VIX index).
 - the “smile” effect and volatility surfaces.
- 3.4.5 Describe approaches to valuing options on discrete dividend-paying securities.
- 3.5 Demonstrate alternative numerical methods for the determination of derivative prices and hedging strategies.
- 3.5.1 Describe the following numerical methods for determining equity and foreign exchange derivative prices and hedging strategies:
- binomial and trinomial trees
 - Monte Carlo techniques
 - finite difference methods
- 3.5.2 Discuss possible methods for determining prices of American options, including Monte Carlo simulation using the least-squares (Longstaff-Schwartz) approach.
- 3.6 Demonstrate the pricing of interest rate derivatives, including the Black model.
- 3.6.1 Determine the following:
- the yield curve, zero rates, forward rates and bond prices
 - the relationship between forward rates and futures rates
 - the value of interest rate swaps
- 3.6.2 Explain the relationship between swap quotes and LIBOR zero rates.
- 3.6.3 Demonstrate the use of the Black model for pricing and valuing the following contracts:
- bond options
 - caps and floors
 - European swap options (swaptions)
- 3.6.4 Comment on the assumptions underlying Black’s model.

- 3.7 Demonstrate the use of models of the term structure of interest rates.
 - 3.7.1 Explain the difference between equilibrium and no-arbitrage models.
 - 3.7.2 Describe the Hull & White model for the term structure of interest rates.
 - 3.7.3 Contrast the Hull & White model with the Vasicek and Cox-Ingersoll-Ross models.
 - 3.7.4 Describe the numerical techniques that can be used to value an interest rate derivative using the risk-neutral approach to pricing.
 - 3.7.5 Outline a valuation method for an interest rate derivative using an appropriate forward measure and zero-coupon bond.
 - 3.7.6 Explain the role of the market price of risk and changes of numeraire in the dynamics of term structure models.
 - 3.7.7 Describe how interest rate models can be developed in a multifactor setting.
 - 3.7.8 Outline the characteristics of the Heath , Jarrow and Morton (HJM) and LIBOR market models.
 - 3.7.9 Demonstrate how the LIBOR market model can be used to price caps and swaptions.
 - 3.7.10 Discuss the use of Black’s model in the calibration of the LIBOR market model, including the problems with this approach.
- 3.8 Outline approaches that can be taken to price property swaps.
- 3.9 Demonstrate an understanding of the pricing of credit derivatives.
 - 3.9.1 Determine the price of a credit default swap.
 - 3.9.2 Explain the role of correlation in pricing credit derivatives.
- 4 Management of derivatives (25%)
 - 4.1 Demonstrate an understanding of how derivatives are used by investors:
 - 4.1.1 Explain how derivatives help investors meet their objectives.
 - 4.1.2 Assess the change in risk profile of a portfolio following the use of derivatives.
 - 4.1.3 Discuss practical issues and limitations arising from derivative use.
 - 4.1.4 Compare alternative strategies.

- 4.2 Demonstrate a knowledge and understanding of how to hedge derivatives.
 - 4.2.1 Calculate the partial derivatives (the Greeks).
 - 4.2.2 Describe the use of the Greeks in hedging individual derivatives and portfolios of derivatives.
 - 4.2.3 Explain how option prices and Greeks change in relation to underlying variables.
 - 4.2.4 Describe how to manage portfolios of derivatives using scenario analysis.
 - 4.2.5 Assess the risk management characteristics of a given derivative, including exotic contracts .
 - 4.2.6 Describe the hedging of interest rate derivatives with respect to the underlying parameters (the Greeks).
 - 4.2.7 Describe delta hedging techniques in relation to credit default swaps.
- 4.3 Describe what is meant by basis risk and its impact on hedging strategies.
- 4.4 Discuss the risks that arise in the use of derivatives, and how to manage them.
 - 4.4.1 Define market risk, credit (or counterparty) risk and liquidity risk.
 - 4.4.2 Identify the market, credit (or counterparty), liquidity and other risks that arise in the use of derivatives.
 - 4.4.3 Outline the way in which these risks affect the use of derivatives and how these risks may be handled.
 - 4.4.4 Describe possible methods for establishing Value at Risk (on a portfolio).
 - 4.4.5 Comment on the weaknesses of the Value at Risk measure.
 - 4.4.6 Discuss the use and limitations of credit ratings.
 - 4.4.7 Describe simple techniques for measuring and managing credit (or counterparty) risk on derivatives, including:
 - International Swaps and Derivatives Association (ISDA) agreements.
 - collateral management.
 - 4.4.8 Describe the risks that arise in the use of specific types of derivative.
- 4.5 Describe how special purpose vehicles can be used as part of a mechanism for risk transfer, including the role of a credit enhancement agency.

5 Solving problems

- 5.1 Analyse hypothetical examples and scenarios in relation to the use and management of financial derivatives.
 - 5.1.1 Propose solutions and actions that are appropriate to the given context, with justification where required.
 - 5.1.2 Suggest possible reasons why certain actions have been chosen.
 - 5.1.3 Assess the implications of actions within a given scenario.
 - 5.1.4 Discuss the advantages and disadvantages of suggested actions, taking into account different perspectives.
- 5.2 Draw charts to illustrate how attributes of portfolios vary with respect to relevant factors, in the context of derivative use.

Core Reading

In contrast to the Core Reading for most other subjects, the Core Reading for this subject consists largely of details of which sections of the Textbooks to study, but is augmented in places by additional material. The Subject SP6 Course Notes include the Core Reading in full, after the ActEd chapters.

The Course Notes cover the complete Subject SP6 syllabus and so cover the same topics as the separate Core Reading and relevant sections of the Textbooks. The Notes, together with the Textbooks, cover what we believe you need to know for the exam. In places, the Textbooks will go into more detail than our Course Notes, but in other places we give more explanation.

Textbooks

The Core Reading makes extensive reference to the following two Textbooks:

- *“Options, Futures, and Other Derivatives”* (ninth edition)

by Hull

ISBN: 1-292-21289-6

- *“Financial Calculus – An introduction to derivative pricing”*

by Baxter & Rennie

ISBN: 0-521-55289-3

These are both well-established derivatives textbooks, which you will want to have available during your studies, although neither of them has been written specifically with actuarial students in mind.

1.3 Subject SP6 – summary of ActEd products

The following products are available for Subject SP6:

- Course Notes
- X Assignments – six assignments:
 - X1-X3: 80-mark tests (you are allowed 2 hours to complete these)
 - X4-X6: 100-mark tests (you are allowed 3¼ hours to complete these)and X Assignment marking (Series Marking and Marking Vouchers)
- ASET (2014-17 papers) – four years of exam papers, *ie* eight sittings, covering the period April 2014 to September 2017
- ASET (2019-20 papers) – two years of exam papers, *ie* four sittings, covering the period April 2019 to September 2020
- Mock Exam – one 100-mark test
- Additional Mock Pack (AMP) – two additional 100-mark tests.

The following tutorials are typically available for Subject SP6:

- regular tutorials (three days)
- block tutorials (three days).

Products are generally available in both paper and eBook format. Visit www.ActEd.co.uk for full details about available eBooks, software requirements and restrictions.

1.4 Subject SP6 – study skills and assessment

Exam skills

Exam question skill levels

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

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

Assessment

The Specialist Principles examinations are in the form of 3¼-hour paper-based examinations.

1.5 Subject SP6 – frequently asked questions

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 **SP6@bpp.com**.

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 **SP6@bpp.com**.

If you have any comments or concerns about the Syllabus or Core Reading, these can be passed on to the profession via ActEd. Alternatively, you can send them directly to the Institute and Faculty of Actuaries' Examination Team by email to **education.services@actuaries.org.uk**.

2.1 Before you start

When studying for the Institute and Faculty of Actuaries 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*.
- an ‘authorised’ **scientific calculator** – you will find the list of permitted calculators on the profession’s website. Please check the list carefully, since it is reviewed each year.

These are both available from the Institute and Faculty of Actuaries’ eShop. Please visit www.actuaries.org.uk.

2.2 How to use the SP6 Course Notes

The SP6 course has a significantly different format from most of the other SP subjects. Rather than being based solely on Core Reading written specifically to cover the syllabus objectives, there are two Textbooks that you must also study. These are:

- “Options, Futures, and Other Derivatives” (9th edition) by Hull
- “Financial calculus – An introduction to derivative pricing” by Baxter and Rennie

You might have received these textbooks with your Combined Materials Pack or you might have chosen to purchase them separately, in which case you should do so as soon as possible.

The Core Reading is included at the end of the ActEd Course Notes, rather than being interspersed throughout the chapters. It is split into 19 units, with references to the relevant sections of the Textbooks and to any other additional material.

Each of our 17 ActEd chapters starts with a list of the syllabus objectives covered. This is followed by a list of the relevant sections of the Textbooks and any relevant Core Reading.

As with most exams, coverage of past papers is crucial to pass Subject SP6. Each of chapters 2 to 17 of our 17 ActEd chapters concludes with one or two exam-style questions from past ST6 exams. Many of the solutions to these questions provide an example of the comprehensive solutions and advice on exam technique that you would expect to receive in our SP6 ActEd Solutions and Exam Technique (ASET) pack, which usually 8 recent ST6 papers.

In addition many of the other past ST6 exam questions are covered in our Q&A bank. Details of which particular questions are covered, together with descriptions on the question content of past exam questions and Q&A bank questions, are provided at the end of each chapter. This Questions section at the end of each chapter is followed by a checklist, which lists all the key things you should have learned whilst studying the chapter.

We suggest you work through each of the chapters of the ActEd Course Notes in turn. To get the maximum benefit from each chapter you should proceed as follows:

1. Read the syllabus objective.
- 2a. Study the material listed in the “Reading / Topics covered” table.
- 2b. Study the Course Notes, which cover the syllabus objectives in a fairly concise style and include extra explanation of some of the key topics.

The Course Notes have been designed so that you can perform steps 2a and 2b in whichever order you wish. Our Course Notes do not rely on you having read the other material first.

3. As you study, pay particular attention to the syllabus objectives. You may wish to annotate the tuition material and possibly make your own notes.
4. Work your way through the exam-style questions at the end of each chapter.

5. Work your way through the Q&A bank and the other past paper questions that are signposted at the end of each chapter.
6. Work your way through the Chapter Checklist carefully. If there are any items that you can't remember covering in the Course Notes, read the relevant section of the notes again to refresh your memory.

We hope you find the SP6 Course interesting and rewarding.

2.3 ActEd study support

This section gives a description of the products offered by ActEd.

Successful students tend to undertake three main study activities:

1. *Learning* – initial study and understanding of subject material
2. *Revision* – learning subject material and preparing to tackle exam-style questions
3. *Rehearsal* – answering exam-style questions, culminating in answering questions at exam speed without notes.

Different approaches suit different people. For example, you may like to revise material gradually over the months running up to the exams or you may do your revision in a shorter period just before the exams. Also, these three activities will almost certainly overlap.

We offer a flexible range of products to suit you and let you control your own learning and exam preparation. The following table shows the products that we produce. Not all products are available for all subjects.

LEARNING	LEARNING & REVISION	REVISION	REVISION & REHEARSAL	REHEARSAL
Course Notes	X Assignments Combined Materials Pack (CMP) X Assignment Marking Tutorials Online Classroom	Flashcards	Revision Notes ASET	Mock Exam Mock Exam Marking

The products and services are described in more detail below.

‘Learning’ products

Course Notes

The Course Notes will help you develop the basic knowledge and understanding of principles needed to pass the exam. They incorporate the complete Core Reading and include full explanation of all the syllabus objectives, with worked examples and questions (including some past exam questions) to test your understanding.

Each chapter includes:

- the relevant syllabus objectives
- a chapter summary
- practice questions with full solutions.

‘Learning & revision’ products

X Assignments

The Series X Assignments are written assessments that cover the material in each part of the course in turn. They can be used to both develop and test your understanding of the material.

Combined Materials Pack (CMP)

The Combined Materials Pack (CMP) comprises the Course Notes and the Series X Assignments.

X Assignment Marking

We are happy to mark your attempts at the X assignments. Marking is not included with the Assignments or the CMP and you need to order it separately. You should submit your script as a PDF attached to an email. Your script will be marked electronically and you will be able to download your marked script via a secure link.

Don't underestimate the benefits of doing and submitting assignments:

- Question practice during this phase of your study gives an early focus on the end goal of answering exam-style questions.
- You're incentivised to keep up with your study plan and get a regular, realistic assessment of your progress.
- Objective, personalised feedback from a high quality marker will highlight areas on which to work and help with exam technique.

In a recent study, we found that students who attempt more than half the assignments have significantly higher pass rates.

There are two different types of marking product: Series Marking and Marking Vouchers.

Series Marking

Series Marking applies to a specified subject, session and student. If you purchase Series Marking, you will **not** be able to defer the marking to a future exam sitting or transfer it to a different subject or student.

We typically send out full solutions with the Series X Assignments. However, if you order Series Marking at the same time as you order the Series X Assignments, you can choose whether or not to receive a copy of the solutions in advance. If you choose not to receive them with the study material, you will be able to download the solutions via a secure link when your marked script is returned (or following the final deadline date if you do not submit a script).

If you are having your attempts at the assignments marked by ActEd, you should submit your scripts regularly throughout the session, in accordance with the schedule of recommended dates set out on our website at **www.ActEd.co.uk**. This will help you to pace your study throughout the session and leave an adequate amount of time for revision and question practice.

The recommended submission dates are realistic targets for the majority of students. Your scripts will be returned more quickly if you submit them well before the final deadline dates.

Any script submitted *after* the relevant final deadline date will not be marked. It is your responsibility to ensure that we receive scripts in good time.

Marking Vouchers

Marking Vouchers give the holder the right to submit a script for marking at any time, irrespective of the individual assignment deadlines, study session, subject or person.

Marking Vouchers can be used for any assignment. They are valid for four years from the date of purchase and can be refunded at any time up to the expiry date.

Although you may submit your script with a Marking Voucher at any time, you will need to adhere to the explicit Marking Voucher deadline dates to ensure that your script is returned before the date of the exam. The deadline dates are provided on our website at **www.ActEd.co.uk**.

Tutorials

Our tutorials are specifically designed to develop the knowledge that you will acquire from the course material into the higher-level understanding that is needed to pass the exam.

We run a range of different tutorials including face-to-face tutorials at various locations, and Live Online tutorials. Full details are set out in our *Tuition Bulletin*, which is available on our website at **www.ActEd.co.uk**.

Regular and Block Tutorials

In preparation for these tutorials, we expect you to have read the relevant part(s) of the Course Notes before attending the tutorial so that the group can spend time on exam questions and discussion to develop understanding rather than basic bookwork.

You can choose **one** of the following types of tutorial:

- **Regular Tutorials** spread over the session.
- a **Block Tutorial** held two to eight weeks before the exam.

ActEd Solutions with Exam Technique (ASET)

The ActEd Solutions with Exam Technique (ASET) contains our solutions to eight past exam papers, plus comment and explanation. In particular, it highlights how questions might have been analysed and interpreted so as to produce a good solution with a wide range of relevant points. This will be valuable in approaching questions in subsequent examinations.

'Rehearsal' products

Mock Exam

The Mock Exam is a 100-mark mock exam paper that provides a realistic test of your exam preparation.

Mock Marking

We are happy to mark your attempts at the mock exams. The same general principles apply as for the X Assignment Marking. In particular:

- Mock Exam Marking is available for the Mock Exam and it applies to a specified subject, session and student
- Marking Vouchers can be used for the Mock Exam.

Recall that:

- marking is not included with the products themselves and you need to order it separately
- you should submit your script as a PDF attached to an email
- your script will be marked electronically and you will be able to download your marked script via a secure link.

2.4 Study skills and assessment

The Subject SP exams

It is important to recognise that the SP subject exams are very different from the Core Principles 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 Core Principles 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 SP 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 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 our 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 the Core Principles (CS, CM or CB subjects), Subject CP1 or other SP 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 Core Principles 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 1.4, 1.7 and 1.12'*, 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 come 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 profession's Student Handbook, which you can download from their website at:

www.actuaries.org.uk/studying

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 SP6, 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
- 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.

There are many sources of exam-style questions. You can use past exam papers, the Practice Questions at the end of each chapter (which include many past exam questions), assignments, mock exams, the Revision Notes and ASET.

Exam question skill levels

Exam questions are not designed to be of similar difficulty. The Institute and Faculty of Actuaries 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.

Command verbs

The Institute and Faculty of Actuaries use command verbs (such as 'Define', 'Discuss' and 'Explain') to help students to identify what the question requires. The profession has produced a document, 'Command verbs used in the Associate and Fellowship examinations', to help students to understand what each command verb is asking them to do.

It also gives the following advice:

- The use of a specific command verb within a syllabus objective does not indicate that this is the only form of question which can be asked on the topic covered by that objective. The examiners may ask a question on any syllabus topic using any of the agreed command verbs, as are defined in the document "Command verbs used in the Associate and Fellowship examinations".
- 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) and 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).
- In the SP subjects, the approximate split of assessment across these three skill types is 25% Knowledge, 50% Application and 25% Higher Order Skills.

You can find the relevant document on the profession's website at:

www.actuaries.org.uk/studying/prepare-your-exams

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*.

Remember to take with you:

- black pens
- an authorised calculator – please refer to **www.actuaries.org.uk** for the latest advice.

Past exam papers

You can download some past exam papers and Examiners' Reports from the profession's website at **www.actuaries.org.uk**. However, please be aware that the majority of these exam papers are for the pre-2019 syllabus and so not all questions will be relevant.

2.5 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 1.5), 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.

If you have many queries on the course material, you should raise them at a tutorial or book a personal tuition session with an ActEd tutor. Information about personal tuition is set out in our current brochure. Please email ActEd@bpp.com for more details.

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 1.5).

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 1.5).

Our tutors also work with the profession to suggest developments and improvements to the Syllabus and Core Reading. If you have any comments or concerns about the Syllabus or Core Reading, these can be passed on via ActEd. Alternatively, you can send them directly to the Institute and Faculty of Actuaries' Examination Team by email to education.services@actuaries.org.uk.