



# Module 2

## Statistics and Models

### Errata

The textbook for the Module 2 examination was rewritten in October 2019 to take into account important syllabus clarification and errors in the old version of the textbook. Since then, the following errors have come to light.

#### **Chapter 1, Page 3**

There is a minus sign missing in the last line of this page. It should say 'ie only when  $t < -\ln 0.6$ .'

#### **Chapter 12, Page 334**

In Example 12.7(b), the middle two probabilities for  $X_3$  are incorrect. It should say:

-1 with probability  $\frac{3}{8}$

+1 with probability  $\frac{3}{8}$

#### **Chapter 14, Page 366**

The two lines of formulae that precede the second box on this page should read as follows (corrections shown in red):

$$S_x(t) = P(T_x > t) = P(T > x+t | T > x) = \frac{P(T > x+t \text{ and } T > x)}{P(T > x)} = \frac{P(T > x+t)}{P(T > x)} = \frac{S(x+t)}{S(x)}$$

Then, since  $S_x(t) = 1 - F_x(t)$ , we have:

$$F_x(t) = 1 - S_x(t) = 1 - \frac{S(x+t)}{S(x)} = \frac{S(x) - S(x+t)}{S(x)} = \frac{(1 - F(x)) - (1 - F(x+t))}{S(x)} = \frac{F(x+t) - F(x)}{S(x)}$$

**Chapter 14, Page 369**

The two lines of formulae that precede the second box on this page should read as follows (corrections shown in red):

$${}_m|_nq_x = P(m < T_x \leq m+n) = P(T_x \leq m+n) - P(T_x < m) = {}_{m+n}q_x - {}_mq_x$$

or:

$${}_m|_nq_x = {}_{m+n}q_x - {}_mq_x = (1 - {}_{m+n}p_x) - (1 - {}_mp_x) = {}_mp_x - {}_{m+n}p_x$$

**Chapter 16, Page 451**

In the box, the formula for the time to reach an absorbing State  $k$  starting from State  $i$  should read:

$$m_i = \frac{1}{\lambda_i} + \sum_{j \neq i, k} \frac{\mu_{ij}}{\lambda_i} m_j$$


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If you purchased your material for the Module 2 examination prior to October 2019 then the following information is relevant to you.

**Chapter 9, pages 252 and 253**

The null and alternative hypotheses should read:

$$H_0 : \sigma = 2.5 \quad \text{vs} \quad H_1 : \sigma \neq 2.5$$

Also, the last line of the solution should read: 'Therefore it is reasonable to assume that  $\sigma = 2.5$ .'

**Chapter 9, page 256**

The null and alternative hypotheses should read:

$$H_0 : \sigma = 2.5 \quad \text{vs} \quad H_1 : \sigma \neq 2.5$$

Also, the last line of the solution should read: 'Therefore it is reasonable to assume that  $\sigma = 2.5$ .'