# MSc in Information Security: Recommended preliminary reading

*Version 0.3: 21st February 2013*

## 1 Introductory remarks

The purpose of this brief document is to provide a set of suggested pre-reading for the Royal Holloway MSc in Information Security. The focus of this pre-reading is to support study on the set of courses making up the compulsory core of the MSc.

The primary purpose of this recommended pre-reading is not to cover the contents of these core courses, but to ensure that all students are appropriately equipped to take the courses. That is, the pre-reading is designed to ensure that all students have a basic understanding of the Computer Science, Information Systems, and Mathematics material underpinning the MSc. Of course, students joining the degree programme who already have a Computer Science BSc (or similar) will probably be familiar with the material already, but by no means all our students are so well-equipped. Even students who do believe they have the appropriate background are recommended to check through the material to ensure that they are well-prepared for the MSc.

The remainder of this document is sub-divided by MSc course headings. Each core course has specific recommendations for reading underpinning the course material.

## 2 Pre-reading for specific courses

### 2.1 IY5501 (Security management)

#### 2.1.1 Specific recommended reading

The report by Kieran Poynter on information security at HM Revenue and Customs, available here:

http://www.hm-treasury.gov.uk/d/poynter_review250608.pdf

is highly recommended as motivatory pre-reading for IY5501.

### 2.2 IY5502 (Introduction to cryptography and security mechanisms)

#### 2.2.1 Recommended books

The following books contain material relevant to this course.

- [M] Keith M Martin, *Everyday Cryptography*. Oxford University Press, 2012. [This is the course text].
- [PM] Fred Piper and Sean Murphy, *Cryptography: A very short introduction*. Oxford University Press, 2002.

### 2.2.2 Specific recommended reading

IY5502 requires an understanding of, and familiarity with, some very elementary Mathematics. It would be great help if students could familiarise themselves with this material, e.g. by reviewing the Mathematics appendix of the course book [M].

It would also be very helpful, and might help to reduce pre-course nerves, if students looked at the helpful little book [PM]. Whilst not covering the course material in any depth, it will give students a taste of the material in the course.

## 2.3 IY5511 (Network security)

### 2.3.1 Recommended books

The following book contains material relevant to this course.

- [LD] Larry L Peterson and Bruce S Davie, *Computer Networks: A Systems Approach*. Morgan Kaufman, 5th edition, 2011.

### 2.3.2 Specific recommended reading

IY5511 is concerned with the vulnerabilities inherent in network communications and the countermeasures that can be deployed. A sound understanding of network architectures and common protocols in the TCP/IP protocol suite will be of considerable value to all students of the course. The chapters indicated below in the recommended book describe the relevant background material. Peterson and Davie is the recommended book for the module and *all* students intending to study the module should read the chapters indicated. I would recommend that you attempt the relevant exercises at the end of each chapter if you have not already studied an undergraduate course in computer networks or do not have relevant industry experience.

- Chapters 1-4;
- Sections 5.1 and 5.2 of chapter 5;
- Sections 9.1 and 9.3 of chapter 9.

## 2.4 IY5512 (Computer security)

### 2.4.1 Recommended books

The following books contain material relevant to this course.

- [G] David Grawrock, *Dynamics of a Trusted Platform*. Intel Press, 2008
- [HP] John L Hennessy and David A Patterson, *Computer Architecture: A Quantitative Approach*. Morgan Kaufmann, 4th edition, 2007. [Available online at: http://www.scribd.com/doc/7279033/Patterson-Hennessy-Computer-Architecture]
- [T] Andrew S Tanenbaum, *Modern Operating Systems*. Prentice Hall, 2nd edition, 2001.

There are a wide range of other books which provide similar coverage, and which could be used instead of the listed texts.

### 2.4.2 Specific reading

There are a number of computer system topics which students taking IY5512 ought to be familiar with in advance of the course. A list of such topics is given below, together with recommended reading in each case.

*General computing*:

- Chapter 1 of [T]. Chapter 3 of [G].

*Processor architectures*:

- Chapter 1 of [T]. Chapter 1 of [HP].

*Memory management*:

- Chapter 4 of [T].

*Operating systems*:

- *File systems*: chapter 6 of [T];
- *Unix*: chapter 10 of [T];
- *Windows*: chapter 11 of [T].

## 2.5 IY5522 (Security technologies)

### 2.5.1 Recommended books

The following books contain material relevant to this course.

- [T1] Andrew S. Tanenbaum, *Computer Networks*. 5th edition, 2010.
- [T2] Andrew S. Tanenbaum, *Modern Operating Systems*. 2nd edition, 2001.
- [G] D. Gollmann, *Computer Security*. 3rd edition, 2011.

There is a selection of other books which provide similar coverage of networks and operating systems, which could be used instead of the listed texts.

### 2.5.2 Specific recommended reading

IY5522 itself serves as an introduction to the basic technical concepts encountered in information security. However it would be helpful is you could familiarise yourself with some essential terminology using the following texts as starting point:

*Basic concepts of computer networks*, such as the OSI and TCP/IP models:

- Chapter 1 of [T1].

*Basic concepts of operating systems*:

- Sections 1.4 and 1.5 of [T2].

*Basic information security concepts* encountered throughout the course:

- Chapters 2 and 3 of [G].

## 2.6 IY5523 (Secure business architectures)

There is no recommended pre-reading for this course.

# 3 General reading

Any further general reading on computing topics would be most helpful for the MSc. A general book on Networks is as follows.

Douglas Comer, *Computer Networks and Internets*. Prentice-Hall, 5th Edition, 2008. See:
http://netbook.cs.purdue.edu/

It is not too detailed and gives an excellent overview of how Networks work.