# Performance Modelling: Annotated Booklist

**Modelling with Generalized Stochastic Petri Nets**
M. Ajmone Marsan, G. Balbo, G. Conte, S. Donatelli and G. Franceschinis, Wiley, 1995.

*This is a very good book—the* essential *reference for GSPN modelling. The early chapters of the book cover basic Petri nets, extensions to nets with timing and nets with priority, and then GSPNs. Later chapters concentrate on particular application areas such as Manufacturing Systems, Communication Systems and Concurrent Programs.*

**A Process Algebra Approach to Software Architecture Design**
A. Aldini, M. Bernardo and F. Corradini, Springer, 2010.

*This book gives a good account of classical, deterministically-timed and stochastically-timed process algebra. It then proposes that these formalisms are a good based for component-oriented modelling of software architectures, and in particular component-oriented performance evaluation. It goes beyond the scope of what we can cover in this course.*

**Probability, Statistics, and Queueing Theory with Computer Science Applications (Second Edition)**
A.O. Allen, Academic Press 1990.

*This is quite a good book although it suffers from numerous typos. It goes at quite a gentle pace, and uses lots of examples, many of them humourously presented. As the title suggests it covers probability theory and queueing theory. Although Markov processes are discussed, it is only really as a stepping stone to queueing models. Much of the material in the book is beyond the scope of this course. The third part of the book is about statistical inference–a topic we won't cover at all.*

**Model-Based Software Performance Analysis**
V. Cortellessa, A. Di Marco and P. Inverardi, Springer 2011.

*This book focusses on predicting the performance of software at the design stage and can be seen as an updating of Connie Smith's influential earlier book on software performance analysis. Here the authors present how performance modelling can be based on design formalisms such as the UML. An interesting topic but something we unfortunately do not have time to cover in this course.*

**The Art of Computer Systems Performance Analysis**
R. Jain, John Wiley, 1991.

*This book is primarily aimed at computer professionals who may need to know about performance analysis. It provides concise and clear introductions to many topics without going into them in depth. These topics include measurement, monitoring, workload characterisation, simulation, queues and queueing networks, and the operational laws—many*

*of the topics we will cover in the course. I did not recommend it as the course text because the treatment is often superficial, it does not address Markovian analysis at all and only discusses simulation in a very abstract way, and also because it is expensive.*

**Statistical Tools for Simulation Practitioners**
J.P.C Kleijnen, Marcel Dekker 1987.

*A very detailed account of the statistical aspects of simulation modelling. For example, in this book you can find much more detail on* replication*,* batch means *and* regeneration*, than I will have time to cover in the course.*

**System Simulation: programming styles and languages**
W. Kreutzer, Addison-Wesley, 1986.

*This book aims to present several different simulation modelling languages and styles by repeatedly considering the same or similar systems represented in different styles. These examples are fairly high-level and light-hearted.*

**Quantitative System Performance: computer system analysis using queueing network models**
E.D. Lazowska, J.Zahorjan, G.S. Graham and K.C. Sevcik, Prentice Hall, 1984.
(No longer in print, and regrettably the library no longer has a copy; however the full text is freely available over the WWW:
`http://www.cs.washington.edu/homes/lazowska/qsp/`)

*This is a good book about queueing networks which also has a very clear explanation of the operational laws and a whole section on parameterisation. Like most of the other books on queueing networks, however, much of the material covered by the book is beyond the scope of this course.*

**Measuring Computer Performance**
David J. Lilja, Cambridge University Press 2000.
`copy on order for JCML`

*Despite the title this book does consider analytic modelling (in the form of queueing networks) and simulation as well as measurement. However the emphasis is on practical measurement techniques, such as defining metrics, measurement strategies, and related statistical analysis — much more depth than we go into in this course.*

**Perfromance by Design: Computer Capacity Planning by Example**
D.A.Menasce, L.W. Dowdy and V.A.F. Almeida, Prentice Hall, 2004. 1994.

*This book takes a practical, example-led approach to introducing the capacity planning aspect of computer performance evaluation. It mostly concentrates on models based on queueing networks, and goes into this topic in much greater depth than we do within the course. However it also has sections on operational laws, model validation and verification and workload characterisation.*

**Probabilistic Modelling**
I. Mitrani, Cambridge University Press, 1998.

*This is an excellent introduction to probability theory, Markov processes and queueing networks. You might find the early chapters useful revision of material from Maths 2Y. It covers most of the material in the first half of the course, with the exception of GSPN modelling, often in more detail than we have time for. The more extended discussions may help clarify ideas for you, so this could be a good book to read along side lecture notes 1 to 10.*

**Performance Solutions: A Practical Guide to Creating Responsive, Scalable Software**
C.U. Smith and L.G. Williams, Addison-Wesley, 2001.

*This book introduces Software Performance Engineering (SPE), a step-by-step methodology for predicting the development challenges and performance of any object-oriented system – and for managing development to achieve performance objectives.*

**Introduction to the Numerical Solution of Markov Chains**
W.J. Stewart, Princeton University Press, 1994.

*This is a very detailed book about solution methods for both discrete time and continuous time Markov chains. The first chapter contains a comprehensive introduction to Markov chains, and a section on queueing networks. The rest of the book is concerned with efficient techniques for finding the steady state probability distribution, especially for models with large state spaces.*