

# QUEUEING THEORY AND ITS APPLICATIONS TO THE PERFORMANCE ANALYSIS OF COMPUTER SYSTEMS

presented by

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## Contents

### November 7:

Exponential distribution and its properties, Poisson process, Markov Chains, Birth-Death Processes, Queueing Systems, Kendall's Notation.

### November 10:

Markov-type Queueing Systems (M/M/1, M/M/n/n, M/M/1//n ) and their investigations.

### November 14:

Modeling tools, Retrial Queueing Systems, Case Studies

## References

### e-notes:

<http://web2.uwindsor.ca/math/hlynka/queue.html>  
<http://web2.uwindsor.ca/math/hlynka/qonline.html>  
<http://web2.uwindsor.ca/math/hlynka/qsoft.html>

### Tool:

<http://irh.inf.unideb.hu/user/jsztrik/education/09/english/index.html>

### Books:

- **Haverkort B.:** Performance of computer communication systems: a model-based approach, J. Wiley, 1998.
- **Daigle J.N.:** Queueing Theory for Telecommunications, Addison-Wesley, 1992
- **Daigle J.N.:** Queueing Theory with Applications to Packet Telecommunication, Springer, 2005
- **Giambene, G.:** Queueing Theory and Telecommunications, Springer, 2005
- **Gross D., Harris C.:** Fundamentals of Queueing Theory, John Wiley, New York, 1985
- **Hayes J.F. , Babu T.V.J.:** Modeling and Analysis of Telecommunication Networks, Wiley-Interscience, 2004

## Exercises

1. Find the distribution function of the waiting time at an M/M/1 system
2. Prove the recurrence relation for the Erlang-blocking probabilities