

Dear reader,

Thank you for your interest in this textbook! The topics covered in this draft are as follows:

Body:

- Chapter 1 - Fundamental Ideas and Key Concepts
- Chapter 2 - Origins of Process-Centric Models (Queueing Models)
- Chapter 3 - State-of-the-Practice Process-Centric Models
- [Chapter 4 - State-of-the-Art Process-Centric Models \(Multi-Method Approach\)](#)
- Chapter 5 - Simulation Input Analysis (with Python)
- Chapter 6 - Simulation Output Analysis (with Python)
- Chapter 7 - Material Handling Library

Appendix:

- AnyLogic's Environment
- General Modeling Techniques
- Building Blocks of Process-Centric Models
- [Background Mathematics](#)
- [Java Basics](#)
- [Experiments \(Local & Cloud\)](#)
- Building Blocks of Material Handling Library

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*Black: Current draft; Blue: First edition (~December 2019); Gray: Second edition (~Mid 2020)*

## Overview of the chapters and appendices

1. Chapter 1 focuses on some of the fundamental concepts and ideas needed for the remaining chapters.
2. Chapter 2 focuses on several types of queueing systems and their models (both probability and simulation models). The probability models are made up of formulas, so you can plug numbers and compare the solutions with your simulation outputs. This chapter is used as a companion for a course on queueing theory and is also very instrumental in teaching basic concepts behind the process-centric models discussed in Chapter 3. Even if queueing models are outside the scope of your course, their simulation models could be imagined as simple process-centric models that are easier to digest before getting into full blown processes brought up in Chapter 3. If you just use the simulation models, students should be able to go over all of its models in a short period of time since they are very similar and structurally simple.
3. Chapter 3 moves into process-centric models (discrete event simulation). The examples in this chapter are lengthy and comprehensive, allowing students to move past simple toy models and learn about the process of model building using more realistic, practical models. Due to the complexity, the lessons here could be covered in multiple sessions over a few weeks.
4. Chapter 4 will add agent-based modeling into the mix and highlights how you can enhance the capabilities of process-centric models with object-oriented designs.
5. The appendices are designed to be usable as standalone mini-chapters. They could have been treated as chapters, but I decided to separate them into appendices to have a better flow for readers. In your curriculum, you can treat them as pre-requisite topics or utilize them throughout the course.

### Important notes and caveats

1. Agent-based terminologies are intentionally kept out of the first three chapters for courses that do not cover it.
2. The first three chapters also use very little Java programming - doing this allows a wider audience to understand and follow the topics introduced.
3. As this is a draft, please expect typos, inconsistencies, and mistakes. This draft is being released early to get feedback from experts (such as yourself) so as to further improve the final release.
4. You may find references across this manuscript to certain appendices or sections that are not included in this draft (e.g., math appendices) – these are incomplete and will be appended in the official release.
5. All the models shown in this draft are included in the companion material and were all tested (and working) in AnyLogic PLE 8.3.

Please send your comments and recommendations to: [anylogic.textbook@gmail.com](mailto:anylogic.textbook@gmail.com)

(This is the preferred channel of communication, so it won't get mixed-in with my other emails. I'll check this email daily and get back to you as soon as possible.)

Best Regards,

Arash Mahdavi