General Introduction

The *Enterprise Modelling and Simulation* module is designed to give you an understanding of the tools and techniques used by both manufacturing and service organisations to implement business process improvement projects.

This course book will help guide you through the module. The module has 13 units covering the theory of enterprise modelling and simulation (Units 1 to 6) as well as a number of case studies (Units 7 to 13). The objective of the case studies is to help you relate your knowledge of enterprise modelling to different real-world situations. This should help you improve your modelling skills and, in turn, enhance your critical thinking, decision making, and problem solving skills.

The 13 units in the module are:

- **Unit 1**: Introduction to Enterprise Modelling
- **Unit 2**: Common Enterprise Modelling Tools and Techniques
- **Unit 3**: Product Modelling and the Product Development Process—Introducing the Role of CAD and CAM
- **Unit 4**: Introduction to Simulation
- **Unit 5**: Business Process Reengineering—An Overview
- **Unit 6**: Enterprise Modelling for Business Process Improvement
- **Unit 7**: Case Study: Business Process Modelling for Process Improvement in the Medical Industry
- **Unit 8**: Case Study: Business Process Modelling in the Pharmaceutical Industry
- **Unit 9**: Case Study: Modelling and Simulation in the Animal Feed Supply Industry
- **Unit 10**: Case Study: Modelling and Simulation of a Food Supply Chain
- **Unit 11**: Case Study: Enterprise Modelling Activity for Process Improvement at a Hospital
- **Unit 12**: Case Study: Business Process Improvement Activity at an Accountancy Firm
- **Unit 13**: Case Study: Business Process Modelling in a Manufacturing Company

At the start of each unit, you will see a set of learning objectives. When you have finished studying a unit, test yourself against each learning objective. If you cannot perform the tasks set out in the learning objectives, go back over the unit and the core textbook until you have mastered the content.
Aim of the Module

As previously mentioned, the aim of this module is to give you a broad overview of the tools and techniques that are used in enterprise improvement activities. Knowledge of enterprise modelling and simulation tools and techniques will help you to decide the best methods to use when faced with business process reengineering or improvement challenges. The case studies outline everyday scenarios experienced by individuals faced with implementing improvement programmes in their organisations.

NOTE: These case studies have been taken and adapted with the kind permission of the students who developed them.

In addition, the module should help you develop a number of Professional Transferable Skills (PTS), such as critical thinking, decision making, and problem solving.

To successfully complete this module, you need to:

- Read the assigned units and any additional reading materials.
- Interact constructively with your tutor and fellow students, both face-to-face and online.
- Perform the self-assessment exercises and consider your results.
- Complete the assignment on time and to a high standard.
- Regularly participate in the Moodle discussion forum.

Remember: Don’t leave it till the last minute to check details and queries with your tutor!

By the time you have completed this module and the associated reading materials and activities, you should be able to:

- Identify business process improvement projects.
- Structure and analyse problems.
- Apply the appropriate techniques to solve problems.
- Demonstrate your progress through the assignment outlined by your tutor.

Core Textbook

The core text book is:


Please note that it is very difficult to find a book that tackles enterprise
modelling to its full potential. The following extract from Barnes and Noble (1998) highlights the advantage of this book.

What sets this book apart from others that explain individual improvement tools is the sequential organization and the integrated explanation for applying the tools. Using an overall process improvement framework, the author groups the tools into a total approach, thereby helping you know when to use each tool and for what purpose.

Every single tool includes an example of its use along with ready-to-use templates for matrices, forms, and charts so you can start using the tools right away. Inside, you'll find more than 40 applications for using the process improvement tools when solving tasks such as prioritizing, problem understanding, problem analysis, idea generation, organization, improvement proposals, and implementation.

Business Process Improvement Toolbox starts by explaining an overall process improvement framework, presents the tools in sequence for this framework, and then concludes with one over-arching case demonstrating the use of all the tools in a concerted effort. As a result, you'll learn how tools fit together and how they can be used in a coherent process improvement system. The author focuses on providing clear, step-by-step instructions and describes an improvement process that can be used in real life. Ideal for novices in the quality field or the more experienced quality professional, the examples used are from a full range of organizations including manufacturing, service, and public institutions.

(ftp://search.barnesandnoble.com/Business-Process-Improvement-Toolbox/ Bjorn-Anderson/e/9780873894388)

We also suggest you take a look at:


This book provides a solid grounding in modelling and simulation techniques without requiring you to be an expert in mathematics or computer programming. The material is presented in such a way as to present all the basic principles and enable you to apply the theory of simulation to real life problems. The text places greater emphasis on the importance of statistical techniques and includes a chapter on statistics for those who have little or no knowledge of this area. A disk containing data files used in the text can be found at the back of the book.

Overview of the Module

Unit 1: The objective of the unit is to give you a brief overview of enterprise modelling. On completion of this unit and the recommended reading materials, you should have an awareness of the representation of processes and systems as well as an awareness of some of the approaches available to you when modelling.
Unit 2: This unit provides you with the information you need to select tools and techniques to:

- Capture existing processes
- Identify wasteful process interactions
- Communicate process revisions and new processes
- Use processes as building blocks for new processes

Unit 3: On completion of this unit and the recommended reading materials, you should have an awareness of the product design process and opportunities for improving this process. You should also be familiar with CAD, its use in product modelling, and the challenges associated with choosing a CAD system for product modelling.

Unit 4: This unit covers simulation—a broad collection of methods and applications to mimic the behaviour of real systems, usually on a computer using appropriate software. The unit provides some background information on determining the level of detail in simulation models and simulation project pitfalls and guidelines for avoiding them.

Unit 5: On completion of this unit and the recommended reading materials, you should have an awareness of the process for business process reengineering (BPR) and its advantages and disadvantages. You should also be familiar with the recommendations for implementing BPR projects and the kinds of changes that occur as a result of such projects.

Unit 6: On completion of this unit, you should have an understanding of how business process models can be used to help improve business processes. You should also have an awareness of the procedure for identifying and documenting business processes, and you should be familiar with the different methods for modelling these processes.

Unit 7 (Case Study): This case study provides some insight into the activities surrounding business process improvement in a strictly regulated industry—the medical industry.

Unit 8 (Case Study): When you have completed this case study, you should have a better understanding of how to present an overview of the business process activities in an organisation.

Unit 9 (Case Study): When you have completed this case study, you should have a better understanding of how to:

- Identify key requirements for supply chain improvement in the animal feed industry.
- Explain the advantages of modelling and simulation in the animal feed industry.
Unit 10 (Case Study): When you have completed this case study, you should have a better understanding of how to:

- Identify a generic supply chain scenario that requires improvement.
- Clearly outline what improvements are required and how these can be implemented.
- Identify the partial and particular models whilst establishing the processes involved in the supply chain scenario.
- Determine whether simulation is an appropriate modelling tool for improving the process.

Unit 11 (Case Study): This case study presents a proposal for improving the process for the procurement of new medical and surgical supplies at a hospital.

Unit 12 (Case Study): This case study provides you with the opportunity to see how a business process improvement activity was carried out in the service industry—namely, in an accountancy firm.

Unit 13 (Case Study): This case study will provide you with an insight into operations at a manufacturing company, whilst exploring the reengineering process of an activity that requires improvement.

Tutorials

In addition to reading this book, you will be expected to attend a number of tutorials, approximately three hours each, during the semester. These will be activity-based. During these tutorials, you will interact with the tutor and each other. The tutor may expect you to prepare topics in advance of attendance.

If, at any stage, you feel you are getting lost or are having any trouble with the material, bring this to the attention of your tutor, either by email or at a tutorial session, so that your concerns can be addressed before they become a problem.

Moodle participation is encouraged at all times. A discussion forum will be set up on Moodle for all students to access and post any queries.

Your tutor will provide online support via this discussion board and/or email as appropriate.

Assessment

There will be one assignment posted on Moodle and discussed at one of the tutorial sessions. The assignment will account for 40% of the overall mark for this module and the end-of-semester exam will account for a further 50%. The final 10% will be allocated to a Discussion Forum activity.
All students are encouraged to engage in early discussion with the tutor regarding the assignment which they will complete over the course of the module.

The end-of-semester exam will be discussed in detail at the exam tutorial session.