Advanced Information Systems for IE
(new name, previously known as: Business support systems)

Offered by: Department of Industrial Engineering & Innovation Sciences
Language: English
Primarily interesting for: Major Industrial Engineering, Major Applied Mathematics, Major Web Science, Major Software Science
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Content and composition
This is a specialized elective package giving an overview of quantitative methods for business process analysis. Performance analysis of business processes and their re-design based on simulation methods are studied in Business Process Simulation. To obtain a competitive advantage, modern businesses apply quantitative analysis methods for improved decision support of their processes, which is considered in Business Analytics & Decision Support. In addition to these courses, students must make a choice between the course Algorithmic Programming for Operations Management and the course Healthcare Information Systems. Algorithmic Programming for Operations Management teaches students to write algorithms that solve operations management problems – from the other two courses – in software, such that computers can calculate the solutions. Healthcare Information Systems teaches students applications of Information Systems in the area of Healthcare. After following these courses, the students have a good overview of and hands-on experience with quantitative analysis of business problems.

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Level classification</th>
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<tr>
<td>1BK20</td>
<td>Business process simulation</td>
<td>3. Advanced</td>
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<tr>
<td>1BK40</td>
<td>Business analytics &amp; decision support</td>
<td>2. Intermediate</td>
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<tr>
<td>1BK00 or</td>
<td>Healthcare information systems</td>
<td>1. Introductory</td>
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<tr>
<td>1BK50</td>
<td>Algorithmic Programming for Operations</td>
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There are no obligatory precedence relations. You need to choose between 1BK00 and 1BK50.

Course description

**Business Process Simulation**
Business Process Simulation is a tool for analyzing the performance of a business process and the impact of certain changes to these processes. Simulation is used when analytical techniques such as queuing theory or a direct experiment in practice cannot be used. A model of the business process is built and executed in a simulation tool in order to get insights in the performance indicators and bottlenecks in the process. Based on this information ideas for redesigning the process (to make it more efficient) can be generated or checked for their impact. In this course, you work in a group on a simulation project for a realistic case. You will apply a simulation methodology to arrive at recommendations for improvement and redesign of the business processes.
Business Enabling Systems
To operate in the modern business ecosystem, organizations require different types of information systems, ranging from enterprise resource planning systems to organize production, executive systems for supporting decision making, and customer relationship management systems. Besides discussing the impact on the organization of different classes of information systems, this course also focuses on key issues related to the selection, implementation, use, and business value of such systems. The course is complemented by hands-on experience on a real-world business information system.

Business Analytics and Decision Support
Agile organizations can gain competitive advantage through timely, thorough and relevant analysis of their (past) performance data. Coupling the results of this analysis to operational and management decisions leads to operational excellence. In this course, students learn about advanced methods of data analysis and information processing, as well as their link to decision making models. Both individual and group decision making is discussed.

Algorithmic Programming for Operations Management
Operations Management addresses many problems for which there are algorithmic solutions. Typical examples of such problems are optimization problems and data analyses. The goal of this course is to teach students the algorithmic programming skills needed to make a computer solve non-trivial instances of these problems. There already exist many tools and libraries that address the above mentioned problems. Therefore, we also teach how to program configurations and adaptations of tool chains.

Healthcare information systems
Health care industry is one of the most information intensive sectors in our society. Consequently, information systems that support health care operations are advancing rapidly. They improve the operational excellence as well as the management of modern health care organizations. In this course, you learn about information technology and information management functions in health care organizations as well as current health care computing issues that health service managers face.