

## Analytics and Optimisation

Home Department: Logistics

Faculty of Economic and Management Sciences

### Description of focal area

Operations research is an analytical approach to data-driven problem-solving and decision-making. Problems are broken down into basic components and then solved in defined steps by mathematical methods. Operations researchers use mathematical optimisation to determine the best performance under the given circumstances. They use simulation to experiment and test solutions before implementing them and analytics to uncover risks and helpful insights, and to make reliable predictions. The techniques presented in this focal area give data scientists a unique edge to find optimal solutions to real-world problems, and they open doors to careers in areas like business analysis and consulting.

| <b>BDatSci</b>  |  |   |  |
|---|--|---|--|
| <b>Focal area: Analytics and Optimisation</b>   |  |   |  |
| <b>First year<br/>(120 credits)</b>   | <b>Second year<br/>(128 credits)</b>   | <b>Third year<br/>(128 credits)</b>   | <b>Fourth year<br/>(132 credits)</b>   |
| <p><b>Compulsory modules</b><br/>Computer Science 113/114(16), 144(16)<br/>Data Science 141(16)<br/>Mathematics 114(16), 144(16)<br/>Probability Theory and Statistics 114(16)</p> <p><b>Plus electives between</b><br/>Actuarial Science 112(8)<br/>Applied Mathematics 144(16)<br/><b>or</b><br/>Economics 114(12), 144(12)</p> | <p><b>Compulsory modules</b><br/>Data Science 241(16)<br/>Computer Science 214(16), 244(16)<br/>Mathematics 214(16)<br/>Mathematical Statistics 214(16), 245(8), 246(8)<br/>Operations Research 214(16), 244(16)</p> | <p><b>Compulsory modules</b><br/>Mathematical Statistics 312(16)<br/>Computer Science 315(16), 34X(16)<br/>Data Science 314(16), 344(16)<br/>Operations Research 314(16), 352 (16), 344(16)</p> | <p><b>Compulsory modules</b><br/>Introduction to Statistical Learning 441(12)<br/>Machine Learning 441(16)<br/>Advanced Linear Programming 441(16)<br/>Metaheuristics 441(16)<br/>Methods of Operations Research 441(16)<br/>Systems Dynamics 441(16)<br/>Data Science Research Assignment 441(40)</p> |