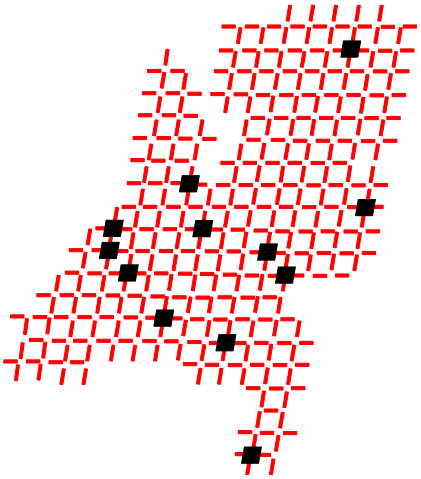

DUTCH NETWORK ON THE MATHEMATICS OF OPERATIONS RESEARCH (LNMB)

MASTER AND PhD PROGRAMME IN OPERATIONS RESEARCH

Information Guide 2010/2011

June 2010

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CONTENTS

Preface

The education programme of the LNMB provides high quality teaching in the broad field of interest in the mathematics of operations research, including new interesting areas. The programme consists of 25 courses for Master and PhD students. This year seven Master courses and nine PhD courses are scheduled (the PhD courses have a cycle of two years). It is allowed that Master students attend PhD courses and, vice versa, that PhD students attend Master courses. The lectures are taught in the Uithof buildings of the Utrecht University.

The education programme for the academic year 2010/2011 consists of the following courses.

Master courses:
Fall 2010:
- Introduction to Stochastic Processes;
- Continuous Optimization;
- Discrete Optimization;
- Heuristic Methods in Operations Research.

Spring 2011:
- Advanced linear programming;
- Scheduling;
- Queueing theory.

PhD courses:
Trimester 1:
- Convex Analysis for Optimization;
- Combinatorial Optimization 1a;
- Robust Optimization.

Trimester 2:
- Combinatorial Optimization 1b;
- Interior point methods;
- Inventory management in supply chains.

Trimester 3:
- Cooperative Games;
- Stochastic programming;
- Service Operations Management.

Besides information about the LNMB courses, this guide contains:
- Organizational and administrative affairs;
- Information about the operations research groups at the Dutch universities;
- Lists of members, PhD students and alumni.

The information is also available via the LNMB website www.lnmb.nl

In addition to the courses, the LNMB organizes the 36th Lunteren Conference on the Mathematics of Operations Research. This conference will be held 18 - 20th January 2011.

The LNMB gladly acknowledges the financial support by the universities. This enables the LNMB to continue its activities.

Johann Hurink,
Scientific director LNMB
June, 2010

1. Dutch Network on the Mathematics of Operations Research (LNMB)

The Dutch Network on the Mathematics of Operations Research (in Dutch: Landelijk Netwerk Mathematische Besliskunde; abbreviated LNMB) is an interuniversity co-operation in which all Dutch universities and the Centre for Mathematics and Computer Science (CWI) in Amsterdam participate. The LNMB has been established in July 1987. From 1987 until 2001 the University of Groningen was its administrator, from 2002 until 2006 the University of Maastricht, and from January 2007 the University of Twente acts as administrator of the LNMB.

The tasks of the LNMB are twofold. Firstly, the LNMB offers courses for PhD and Master students, and is responsible for the annual Lunteren Conference on the Mathematics of Operations Research. Secondly, the LNMB is an organization of full and associate professors in the field of Operations Research. The universities and the CWI are represented in the General Board out of whom an Execitive Board is chosen.

The LNMB has 107 members and 156 PhD students. The LNMB courses are also accessible, on payment, to other interested people. An independent judgment by NWO (Netherlands Organization for Scientific Research) has proven that the LNMB graduate education programme is of a high international standard.

2. PhD courses and diploma requirements (general information)

The programme of the LNMB PhD courses consists of a biennial cycle and in each cycle 18 courses are offered. The subjects of the courses are in the following areas: Combinatorial Optimization, Stochastic Operations Research, Mathematical Programming, Game Theory and Applications of OR.

The programme is flexible in the sense that new PhD students can start with their programme at the beginning of any trimester. Furthermore, the individual programmes can vary; each student can choose his of her own parts of the education programme. In each trimester a combination of various subjects is taught. In general one can follow each of the courses without any prerequisites of the other courses. The courses take place on Monday in Utrecht.

The courses are intended for PhD students in Operations Research. However, Master students in mathematics, econometrics or computer science who acquired enough prerequisites are also welcome. Further information can be obtained from the director of the LNMB or from the lecturers of the courses. Furthermore, government and/or business employees who want to follow a course may participate. Participants are expected to make exercises (homework) during or at the end of the course to show that they have understood the contents of the course. The credits (including for the attendance of the course) for participants who have passed the exercises successfully have been set at 4 EC per course. In case the courses are only attended (or when the exercises are not passed successfully), the workload is set at 1 EC. At the end of each course the participants receive a certificate with the grade and the credits involved.

The following regulation holds for the course fee. Participants from the departments of the Dutch universities which finance the LNMB don't pay any course fee. Other participants pay for each course a fee of 500 euro. The director of the LNMB is authorized to grant a reduction of this fee at occurring situations.

Application to a LNMB PhD course can be done by filling in the online application form available at the website http://www.lnmb.nl/pages/courses/. PhD students who participate for the first time in LNMB courses, also have to fill in the form for New PhD Students, which also can be found on the mentioned website.

In addition to the courses, the PhD programme includes the Lunteren Conference on the Mathematics of Operations Research. During this conference prominent - usually foreign - researchers lecture on special topics or on recent research. PhD students can give a so-called PhD presentation. In such a presentation one can present his or her research results. Attendance in the Lunteren Conference is credited by 1 EC.

PhD students who have sufficiently participated in the LNMB PhD programme and have given a PhD presentation will receive a diploma. Here, ‘sufficiently’ means total credits of 25 EC. Under certain circumstances the supervisor may submit a motivated request to give the diploma to a PhD student although he or she did not meet the requirement of the PhD presentation. After consultation with the director, it is possible that credit points from a related PhD network also count as credit points for the LNMB diploma.

3. Master courses (general information)

From September 2004, the LNMB provides Master courses in Operations Research. These courses are intended for Master students in Mathematics or Econometrics who want to take one or more courses in Operations Research. Usually, the Master thesis adviser will propose or decide that a student will participate in LNMB Master courses.

Due to the small number of Master students in Operations Research at each individual university, a national concentration is efficient and can help to guarantee a qualitatively high education. This is the main purpose of the LNMB Master courses. An additional advantage for the students is the contact with professors and students from other universities. The LNMB Master courses are part of the Dutch Master Programme in Mathematics, which is a coordinated programme of the Departments of Mathematics of the Dutch universities.

In each semester (Fall and Spring) three or four LNMB Master courses are given. The subjects of the courses are taken from the following areas: Mathematical Programming, Combinatorial Optimization and Stochastic Operations Research. The programme is flexible in the sense that new Master students can start with their programme at the beginning of any semester. Furthermore, the individual programmes can vary; each student can choose his of her own courses. The courses take place on Monday in Utrecht.

Although the courses are intended for Master students, PhD students are also welcome. It is up to their thesis adviser to propose or decide that a PhD student will attend such a course. Further information can be obtained from the director of the LNMB.

The students are subjected to an examination that usually will consist of making exercises during the course and also a written or oral examination. The credits for participants who have passed the examination successfully have been set by the LNMB at ***6 EC*** per course. A final decision about the credits and the grade is formally up to the university of the student.

The organisational part of the Master courses is done by the Dutch Master's Degree Programme in Mathematics (Mastermath). Therefore, Master- as wel as PhD-students have to register for the Master courses of the LNMB via the website of Mastermath (http://www.mastermath.nl/). Mastermath distribute the results of the Master students to the corresponding universities and the PhD students get a certificate via LNMB.

4. PhD courses 2010/2011

During the academic year 2010/2011 nine courses will be taught in three trimesters; each trimester has a duration of nine weeks.

Trimester 1 (September 13 – November 8):
- CAO (Convex Analysis for Optimization);
- CO1a (Combinatorial Optimization 1a);
- RO (Robust Optimization).

Trimester 2 (November 15 – December 13 & January 24 – February 14):
- IPM (Interior Point Methods);
- CO1b (Combinatorial Optimization 1b);
- IMSC (Inventory Management in Supply Chains).

Trimester 3 (February 21 – April 18):
- CG: Cooperative Games;
- SP: Stochastic Programming;
- SOM: Service Operations Management.

The courses are given on Monday according to the following schedule:

	Trimester 1	*Trimester 2*	*Trimester 3*
10.15 - 11.00	Course CAO	Course IPM	Course CG
11.15 - 12.00	Course CAO	Course IPM	Course CG
12.00 - 13.00	Lunch break	Lunch break	Lunch break
13.00 - 13.45	Course CO1a *	Course CO1b *	Course SP
14.00 - 14.45	Course CO1a *	Course CO1b *	Course SP
15.00 - 15.45	Course RO	Course IMSC	Course SOM
16.00 - 16.45	Course RO	Course IMSC	Course SOM

* = in cooperation with EIDMA/DIAMANT

Location
The courses are given in the Uithof (buildings of the Utrecht University), in the Mathematical Building, Room 611AB, Budapestlaan, Utrecht.

Credits
The credits (including for the attendance of the course) for participants who have passed the exercises successfully are ***4 EC*** per course. In case the courses are only attended (or when the exercises are not passed successfully), then the workload is set at ***1 EC***. At the end of each course the participants receive a *certificate* with the grade and the credits involved.

Registration
Anyone interested in these courses is invited to fill in the online registration form on the webpage of the LNMB (http://www.lnmb.nl/pages/courses/phdcourses/). For each of the three trimesters a separate form is given. If you are a new PhD student, please also fill in the 'Form for New PhD students' on that webpage.

Course CAO: "Convex Analysis for Optimization"

Time : Monday 10.15 – 12.00 (September 13 – November 8).
Location: Mathematical Building, Room 611AB, Budapestlaan, Utrecht (De Uithof).
Lecturer: Prof.dr.ir. E.J. Balder (University of Utrecht).

Course description:
Convexity plays an important role in optimization, particularly in nonlinear optimization. Many applications of optimization problems are nonlinear but have the convexity property. For convex optimization an elegant mathematical theory can be developed, including a duality theory and algorithmic aspects.

Key words for the course are: convex sets and functions; separation theorems; subdifferential calculus; polarity; Karush-Kuhn-Tucker theorem; duality; minimax results in game theory; optimal consumption and investment in economics.

Literature: Lecture notes will be provided. In addition (also as indication for the level):
- M.S. Bazaraa, H.D. Sherali and C.M. Shetty, Nonlinear programming, theory and algorithms, 2nd edition, Wiley, 1993;
- Borwein, J. and A.S. Lewis, Convex analysis and nonlinear optimisation, 2nd edition, Springer-Verlag, New York, 2006;
- R.T. Rockafellar, Convex analysis, Princeton University Press, 1970.

Prerequisites:
Basic knowledge (bachelor level) of analysis and linear algebra.

Examination:
Take home problems.

Address of the lecturer:
Prof.dr.ir. E.J. Balder
Mathematical Institute, University of Utrecht, P.O. Box 80.010, 3508 TA Utrecht
Phone: 030 - 2531458
E-mail: balder@math.uu.nl

Course CO1a: Combinatorial Optimization 1a

Time : Monday 13.00 – 14.45 (September 13 – November 8).
Location: Mathematical Building, Room 611AB, Budapestlaan, Utrecht (De Uithof).
Lecturers: Prof.dr. M. Laurent (CWI and Tilburg University).

Course description:
Combinatorial optimization problems are concerned with the efficient allocation of limited resources to meet desired objectives when the values of the variables are restricted to be integral.

Combinatorial problems arise in various applications, e.g. airline crew scheduling, manufacturing, network design, cellular telephone frequency design and optimization problems on graphs.

The course deals with polynomial-time solvable combinatorial optimization problems. Many of these problems are special cases of linear programming problems.

The following subjects are discussed:
- Shortest paths and trees;
- Polytopes, polyhedra, Farkas' lemma and linear programming;
- Matchings and covers in bipartite graphs;
- Menger's theorem, flows and circulations;
- Non-bipartite matchings.

Literature:
- Lecture notes: A Course in Combinatorial Optimization, A. Schrijver, CWI (chapters 1-5);
- B. Korte and J. Vygen, Combinatorial Optimization, 2e edition, Springer 2001;
- A. Schrijver, Combinatorial Optimization: Polyhedra and efficiency, Volume A: Paths, Flows, Matchings, Springer 2003.

Prerequisites:
Basic knowledge (bachelor level) of linear algebra and graph theory.

Examination:
Take home problems.

Address of the lecturer:
Prof.dr. M. Laurent
CWI, P.O. Box 94079, 1090 GB Amsterdam.
Phone: 020 - 5924105.
E-mail: m.laurent@cwi.nl

Course RO: Robust Optimization

Time : Monday 15.00 – 16.45 (September 13 – November 8).
Location: Mathematical Building, Room 611AB, Budapestlaan, Utrecht (De Uithof).
Lecturer: Prof. Aharon Ben-Tal (Technion – Israel Institute of Technology) and Prof.dr.ir. D. den Hartog (Tilburg University).

Course description:
Optimization problems often contain parameters that are uncertain. The recent methods developed in Robust Optimization try to find solutions that are robust against these uncertainties. The idea is to define a so-called uncertainty region for the uncertain parameters, and then require that the constraints should hold for all parameter values in this uncertainty region. For several optimization problems, and for several choices of the uncertainty region, it has been shown that this so-called robust counterpart problem can be reformulated as tractable optimization problems. The main focus of this course is on robust linear optimization (LO).

The main topics treated are:
- Uncertain LO problems:
  - Data uncertainty in LO;
  - Tractability of robust counterparts;
  - Non-affine perturbations;
  - Applications in logistics, marketing, finance, engineering,… .

- Robust counterpart approximations of scalar chance constraints:
  - How to specify an uncertainty set?;
  - Chance constraints;
  - Safe tractable approximations.
- Globalized robust counterparts of uncertain LO problems:
  - Motivation and definition of globalized robust counterpart;
  - Computational tractability;
  - Alternative formulation.
- Data-driven uncertainty regions and their tractability:
  - Phi-divergence distance and goodness-of-fit;
  - Tractability of robust LO problem with phi-divergence based uncertainty region.
- Robust adjustable multistage optimization:
  - Adjustable robust counterpart;
  - Restriction to affine decision rules.

Literature:
Selected parts of:
- A. Ben-Tal, L. El-Ghaoui, A. Nemirovski, Robust Optimization, Princeton Series in Applied Mathematics , 2009;
- Handouts.

Prerequisites:
- Knowledge of basic linear algebra;
- Knowledge of linear programming and duality;
- Basic knowledge of non-linear optimization.

Examination:
Project in which the student applies different aspects of Robust Optimization to her/his own optimization problem (preferably chosen from own research topic). Final deliverable is a report on this project.

Addresses of the lecturers:
Prof. Aharon Ben-Tal
Technion - Israel Institute of Technology
E-mail: abentalie.technion.ac.il

Prof.dr.ir. D. den Hertog
Tilburg School of Economics and Management
Tilburg University, P.O. Box 90153 LE Tilburg
Phone: 013 -4662122
E-mail: d.denhertog@uvt.nl

Course IPM: "Interior Point Methods"

Time : Monday 10.15 – 12.00 (November 15 – December 13 & January 24 – February 14).
Location: Mathematical Building, Room 611AB, Budapestlaan, Utrecht (De Uithof).
Lecturer: Prof.dr. E. de Klerk (Tilburg University).

Course description:
The field of optimization, particularly linear, convex and semi-definite optimization, has been given a new impulse by the development of interior point methods. Besides the existence of a new theory, there is a tremendous activity in new applications, especially in semi-definite programming.

The topics for this course include:
- interior-point methods for conic programming;
- classical duality theory for conic programming;
- symmetric cones;
- primal-dual interior-point algorithms;
- semidefinite programming.

Literature:
- Main course notes (students: please buy or borrow this book before the course starts. If you order the book from Amazon.com, then allow enough time for delivery);
- James Renegar, "A Mathematical View of Interior-Point Methods for Convex Optimization". MPS-SIAM Series on Optimization, Philadelphia (2001);
- Additional course notes: Stephen Boyd and Lieven Vandenberghe. Convex Optimization, Cambridge University Press (2004). Available online: http://www.stanford.edu/~boyd/cvxbook/.

Prerequisites:
Basic knowledge (bachelor level) of analysis (multivariate calculus) and linear algebra, as well as a first course in linear and nonlinear programming.

Examination:
Take home problems.

Address of the lecturer:
Prof.dr. E. de Klerk
Department of Econometrics & Operations Research, Tilburg University, P.O. Box 90153, 5000 LE Tilburg.
Phone: 013 - 4662031.
E-mail: e.deklerk@uvt.nl

Course CO1b: "Combinatorial Optimization 1b"

Time : Monday 13.00 – 14.45 (November 15 – December 13 & January 24 – February 14).
Location: Mathematical Building, Room 611AB, Budapestlaan, Utrecht (De Uithof).
Lecturer: Dr.ir. C.A.J. Hurkens (Eindhoven University of Technology).

Course description:
Combinatorial optimization problems are concerned with the efficient allocation of limited resources to meet desired objectives when the values of the variables are restricted to be integral. Combinatorial problems arise in various applications, e.g. airline crew scheduling, manufacturing, network design, cellular telephone frequency design and optimization problems on graphs. The course deals with polynomial-time solvable combinatorial optimization problems. Many of these problems are special cases of problems that are intrinsically hard to solve - in general.

The following subjects are discussed:
- problems, algorithms and running time; cliques, cocliques and colouring;
- integer linear programming and totally unimodular matrices; multicommodity flows and disjoint paths; matroids.

Literature:
- Lecture notes: A Course in Combinatorial Optimization, A. Schrijver, CWI (chapters 6-10);
- A. Schrijver, Combinatorial Optimization: Polyhedra and efficiency, Volumes A, B, and C, Springer 2003.

Prerequisites:
Basic knowledge (bachelor level) of linear algebra and graph theory.

Examination:
Take home problems.

Address of the lecturer:
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E-mail: c.a.j.hurkens@tue.nl

Course IMSC: "Inventory Management in Supply Chains"

Time : Monday 15.00 – 16.45 (November 15 – December 13 & January 24 – February 14).
Location: Mathematical Building, Room 611AB, Budapestlaan, Utrecht (De Uithof).
Lecturers: Prof.dr. A.G. de Kok (Eindhoven University of Technology) and prof.dr.ir. G.J.J.A.N. van Houtum (Eindhoven University of Technology).

Course description:
This course consists of two parts. In the first part, we study classical supply chains, in which multiple parties cooperate in order to satisfy the requirements of the clients against minimal total costs. The cooperation becomes operational by coordinating the orders in the chain.

By a better coordination between inventory and production, costs may be saved in the total chain. We study various coordination strategies. We start with strategies for individual items at single locations and we end with strategies for multiple items in whole networks of production and inventory points. In the second part, we study spare parts networks.

Many advanced technical systems require high uptime percentages. For most of these systems, a repair-by-replacement concept is used and then a smart method for the spare parts provisioning is essential to realize high uptime percentages against reasonable costs. Key issues are the use of multi-item models which are directly focussed on the availability of the technical systems, the use of lateral transshipments to create pooling effects, and differentiation between customers with different uptime requirements. In both parts, we treat the fundamental mathematical models, we discuss various modelling aspects, and we present applications in real-life situations.

Literature:
- Course reader;
- E.A. Silver, D.F. Pyke and R. Peterson, Inventory management and production planning and scheduling, 3rd edition, Wiley, 1998.

Prerequisites:
Basic knowledge (bachelor level) of analysis and linear algebra, as well as probability theory.

Examination:
Take home problems.

Addresses of the lecturers:
Prof.dr. A.G. de Kok
Department of Technology Management, Eindhoven University of Technology, P.O. Box 513, 5600 MB Eindhoven.
Phone: 040 - 2473849.
E-mail: a.g.d.kok@tm.tue.nl

Prof.dr.ir. G.J.A.N. van Houtum
Department of Technology Management, Eindhoven University of Technology, P.O. Box 513, 5600 MB Eindhoven.
Phone: 040 - 2475163
E-mail: g.j.v.houtum@tm.tue.nl

Course CG: "Cooperative Games"

Time : Monday 10.15 – 12.00 (February 21 – April 18).
Location: Mathematical Building, Room 611AB, Budapestlaan, Utrecht (De Uithof).
Lecturers: Prof.dr. P.E.M. Borm (Tilburg University).

Course description:
Game theory studies interactive decision situations involving conflict and/or cooperation. In cooperative games binding agreements are allowed and the players may form coalitions. The focus is on the question how to reallocate the resulting joint coalitional payoff among the players in a fair way.

The following subjects are discussed:
- Games in characteristic form (TU games);
- Shapley value, compromise value and nucleolus;
- Core concepts;

- Convexity and compromise stability;
- Some classes of ORGames: flow games and linear production games.

Literature:
Lecture notes will be provided.
NOT compulsory (just as an indication):
- S.H. Tijs, Introduction to Game Theory, Hindustan Book Agency, India, 2003.

Prerequisites:
Basic knowledge of analysis and linear algebra.

Examination:
Take home problems.

Address of the lecturer:
Prof.dr. P.E.M. Borm
Department of Econometrics & Operations Research, Tilburg University, P.O. Box 90153, 5000 LE Tilburg.
Phone: 013 - 4663026.
E-mail: p.e.m.borm@uvt.nl

Course SP: "Stochastic Programming"

Time : Monday 13.00 – 14.45 (February 21 – April 18).
Location: Mathematical Building, Room 611AB, Budapestlaan, Utrecht (De Uithof).
Lecturer: Prof.dr. M.H. van der Vlerk (University of Groningen).

Course description:
Stochastic programming (see also http://stoprog.org) is a framework for modelling optimization problems that involve uncertainty. Whereas deterministic optimization problems are formulated with known parameters, real world problems almost invariably include some unknown parameters. When the parameters are known only within certain bounds, one approach to tackling such problems is called robust optimization. Here the goal is to find a solution which is feasible for all such data and optimal in some sense. Stochastic programming models are similar in style but take advantage of the fact that probability distributions governing the data are known or can be estimated. The goal here is to find some policy that is feasible for all (or almost all) the possible data instances and maximizes the expectation of some function of the decisions and the random variables. More generally, such models are formulated, solved analytically or numerically, and analyzed in order to provide useful information to a decision-maker.

The most widely applied and studied stochastic programming models are two-stage linear programs. Here the decision maker takes some action in the first stage, after which a random event occurs affecting the outcome of the first-stage decision. A recourse decision can then be made in the second stage that compensates for any bad effects that might have been experienced as a result of the first-stage decision. The optimal policy from such a model is a single first-stage policy and a collection of recourse decisions (a decision rule) defining which second-stage action should be taken in response to each random outcome.

The following subjects are discussed:
- Concepts and examples of stochastic programming;
- Stochastic linear programming;
- Recourse models;
- Chance constraints;
- SP calculus (e.g. convexity; approximation of distributions);
- Algorithms;
- Stochastic integer programming;
- Multi-stadia recourse models;
- Case study.

Literature:
Lecture notes will be provided.
Indication for the level:
- J.R. Birge and F. Louveaux, Introduction to stochastic programming, Springer, 1997;
- P. Kall and S.W. Wallace, Stochastic programming, Wiley-Interscience Series in System and Optimization, 1994.

Prerequisites:
- Basic knowledge of probability theory: S.M. Ross, Introduction to probability models, 8th edition, Academic Press, 2003 (chapters 1-3);
- Basic knowledge of linear programming: V. Chvatal, Linear programming, Freeman, 1983.

Examination:
Take home problems, case study.

Address of the lecturer:
Prof.dr. M.H. van der Vlerk
Department of Operations, University of Groningen, P.O. Box 800, 9700 AV Groningen.
Phone: 050 - 3633816.
E-mail: m.h.van.der.vlerk@rug.nl

Course SOM: "Service Operations Management"

Time : Monday 15.00 – 16.45 (February 21 – April 18).
Location: Mathematical Building, Room 611AB, Budapestlaan, Utrecht (De Uithof).
Lecturers: Prof.dr. G.M. Koole (VU University Amsterdam) and Dr. R. Bekker (VU University Amsterdam).

Course description:
We study applications of stochastic models in the service sector, mainly revenue management and applications in call centers. Although the emphasis is on the stochastic models, we discuss also relevant statistical and mathematical programming problems.

Literature:
Lecture notes: Optimization of Business Processes: An Introduction to Applied Stochastic Modeling, G.M. Koole, 2006.

Prerequisites:
Basic probability theory, Markov processes, elementary queueing theory (Erlang B and C, Pollaczek-Khintchine).

Examination:
Take home problems.

Addresses of the lecturers:
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Dr. R. Bekker
Vrije Universiteit Amsterdam, De Boelelaan 1081a, 1081 HV Amsterdsam
Phone: 020 - 5987755
E-mail: rbekker@few.vu.nl

5. Master courses 2010/2011

During the academic year 2010/2011 seven courses will be taught in two semesters; each semester has a duration of 12 weeks. The courses are part of the Dutch Master Programme in Mathematics (http://www.mastermath.nl).

Fall 2010:
- ISP (Introduction to stochastic processes; September 6, 7, 13 and 14);
- CO (Continuous optimization; September 20 – December 6);
- DO (Discrete optimization; September 20 – December 6);
- HEU (Heuristic Methods in Operations Research; September 20 – December 6).

Spring 2011 (January 31 – April 18):
- ALP (Advanced linear programming);
- SCH (Scheduling);
- QT (Queueing theory).

The courses are given on Monday according to the following schedule:

	*Fall 2010**	*Spring 2011*
11.00 - 11.45	Course CO	Course ALP**
12.00 - 12.45	Course CO	Course ALP**
12.45 - 13.15	Lunch break	Lunch break
13.15 - 14.00	Course DO	Course SCH
14.15 - 15.00	Course DO	Course SCH
15.15 - 16.00	Course HEU	Course QT
16.15 - 17.00	Course HEU	Course QT

* The course ISP is thaught on September 6, 7, 13 and 14 (10.15 – 12.00 and 13.00 – 14.45 each day).
** In cooperation with EIDMA/DIAMANT

Location
The courses are given in the Uithof (buildings of the Utrecht University). Detailed information on the location can be found on the website of the Dutch Master Programme in Mathematics (Masthermath): http://www.mastermath.nl/locations.

Credits
The credits for students who have passed the exercises successfully are 6 EC per course, except the short course ISP (4 EC).

Detailed information about the courses
The registration and administration of the master courses is done by the Dutch Master Programme in Mathematics. Anyone interested in these courses is invited to register via http://www.mastermath.nl.

Course ISP: "Introduction to Stochastic Processes"

Time : Monday 10.15 – 12.00 and 13.00 – 14.45 (September 6, 7, 13 and 14).
Location: Utrecht (De Uithof).
Lecturers: Prof.dr.ir. I.J.B.F. Adan (Eindhoven University of Technology) and Prof.dr.ir. O.J. Boxma (Eindhoven University of Technology).

Aim:
To provide an introduction in the basic notions of stochastic processes as applied in stochastic operations research topics like queueing theory and Markov decision processes.

Description:
The following subjects will be treated:
- Discrete time Markov chains, including classification of states and long run behaviour and branching processes;
- Exponential distribution and Poisson Processes;
- Generating functions and Laplace-Stieltjes transforms;
- Continuous time Markov chains and birth-and-death processes;
- Renewal theory, including renewal theorem, renewal reward processes and regenerative processes.

Literature:
S.M. Ross, 'Introduction to probability models', 9th edition, Academic Press, 2007.

Examination:
Written examination.

Prerequisities:
Basic knowledge of probability at the level: S.M. Ross, 'Introduction to probability models', 9th edition, Academic Press, 2007 (chapters 1-3).

Addresses of the lecturers:
Prof.dr.ir. I.J.B.F. Adan
Dept. of Mathematics & Computer Science, Eindhoven University of Technology
P.O. Box 513, 5600 MB Eindhoven
Phone: 040-2472932
E-mail: i.j.b.f.adan@tue.nl

Prof.dr.ir. O.J. Boxma
Dept. of Mathematics & Computer Science, Eindhoven University of Technology
P.O. Box 513, 5600 MB Eindhoven
Phone: 040-2472858/3130
E-mail: o.j.boxma@tue.nl

Course CO: "Continuous Optimization"

Time : Monday 11.00 – 12.45 (September 20 – December 6).
Location: Utrecht (De Uithof).
Lecturer: Dr. G.J. Still (University of Twente).

Aim:
The course aims to provide an advanced introduction into the basics and methods of nonlinear continuous optimisation (also called nonlinear programming).

Course description:
The course starts with some historical examples and an introduction into convex sets and convex functions. Then, optimality conditions in unconstrained and constrained optimization are discussed with emphasis on convex problems. Duality in convex optimization is the next topic followed by an introduction into the basic algorithms for unconstrained and constrained problems. Finally as a special topic, LP-, Lagrange- and semidefinite-relaxations of integer programs are studied.

Literature:
- Lecture notes "Nonlinear Optimization", by E. de Klerk, C. Roos, T. Terlaky;
- Algorithmic Principles of Mathematical Programming" by U. Faigle, W. Kern and G. Still.

Prerequisites:
Basic knowledge of linear algebra and multivariate analysis.

Examination:
Written examination.

Remark:
More information and study material is to be found at http://wwwhome.math.utwente.nl/~stillgj/conopt/index.html.

Address of the lecturer:
Dr. G.J. Still
Department of Applied Mathematics, University of Twente, P.O. Box 217, 7500 AE Enschede
Phone: 053-4893404
E-mail: g.j.still@utwente.nl / URL: http://wwwhome.math.utwente.nl/~stillgj/conopt/index.html

Course DO: "Discrete Optimization"

Time : Monday 13.15 – 15.00 (September 20 – December 6).
Location: Utrecht (Uithof).
Lecturer: Prof.dr. M. Uetz (University of Twente).

Aim:
To provide a solid foundation in Discrete Optimization, with an eye on algorithm design and algorithm analysis, including the basics of computational complexity.

Course description:
In Discrete Optimization, as opposed to Continuous Optimization, we deal with objects which are finite or at most countable. An archetypical problem is the notorious traveling salesman problem (find the shortest of a finite number of possible tours), but also linear programming can de seen as a discrete problem (find the best among a finite number of vertices of a polyhedron). The course introduces some of the most relevant problems from the area, as well as algorithms to solve them.

The following topics will (most probably) be treated:
- Algorithms & Analysis;
- Shortest Path Algorithms;
- Spanning Trees & Matroids;
- Maximum Flows & Minimum Cuts;
- Minimum Cost Flows;
- P, NP, coNP, NP-completeness;
- Integer Linear Programming & Total Unimodularity;
- Approximation Algorithms;
- Primal-Dual Algorithms;
- Inapproximability & Approximation Schemes.

Literature:
We use a reader with selected chapters from several books listed below. The reader can be purchased in the first lecture. Occasionally additional copies will be distributed, if necessary.
- W.J. Cook, W.H. Cunningham, W.R. Pulleyblank and A. Schrijver: Combinatorial Optimization, Wiley, 1998;
- C.H. Papadimitriou and K. Steiglitz: Combinatorial Optimization; Algorithms and complexity, Prentice-Hall, 1982;
- R.K. Ahuja, T.L. Magnanti and J.B. Orlin: Network Fflows, Prentice Hall, 1993;
- T. Cormen, C. Leiserson, R. Rivest and C. Stein: Introduction to Algorithms, 2nd ed., MIT Press, 2001;
- B. Korte and J. Vygen: Combinatorial Optimization - Theory and Algorithms, 4th ed., Springer, 2008;
- V. Vazirani: Approximation Algorithms, Springer-Verlag, 2001;
- U. Faigle, W. Kern, and G. Still: Algorithmic Principles of Mathematical Programming, Springer, 2002.

Prerequisites:
Knowledge of linear algebra and basic graph theory is recommended.

Examination:
Take home problems (40%) and a written exam (60%).

Address of the lecturer:
Prof.dr. M. Uetz
Department of Applied Mathematics, University of Twente, P.O. Box 217, 7500 AE Enschede
Phone: 053-4893420
E-mail: m.uetz@utwente.nl / URL: http://wwwhome.math.utwente.nl/~uetzm/home.html

Course HEU "Heuristic Methods in Operations Research"

Time : Monday 15.15 – 17.00 (September 20 – December 6).
Location: Utrecht (De Uithof).
Lecturers: Prof.dr. J.L. Hurink (University of Twente) and dr. J.M.J. Schutten (University of Twente).

Aim:
This course gives an overview of heuristic solution methods in combinatorial optimization.

Description:
Due to the computational complexity of most of the practical relevant optimization problems, heuristic methods form an important class of solution methods for such problems. In this course we give an overview of different classes of heuristic solution approaches and present examples of their application.

In detail, the following issues are treated:
- Sampling based heuristics;
- Restricted dynamic programming;
- Truncated branch and bound/beam search;
- Relaxations/lower bounds;
- Evaluation techniques;
- Local Search;
- Evolutionary methods;
- Hierarchical and decentralized approaches.

Literature:
Handouts.

Examination:
Oral or written examination and possibly take home problems.

Prerequisities:
Basic knowledge (bachelor level) of analysis, linear algebra and linear programming.

Addresses of the lecturers:
Prof.dr. J.L. Hurink
Department of Applied Mathematics, University of Twente, P.O. Box 217, 7500 AE Enschede
Phone: 053 – 4893447
E-mail: j.l.hurink@utwente.nl / URL: www.math.utwente.nl/~hurinkjl

Dr.ir. J.M.J. Schutten
Department OMPL, University of Twente, P.O. Box 217, 7500 AE Enschede
Phone: 053 – 4894676
E-mail: j.m.j.schutten@utwente.nl / URL: www.mb.utwente.nl/ompl/staff/Schutten/

Course ALP: "Advanced Linear Programming"

Time : Monday 11.00 – 12.45 (January 31 – April 18).
Location: Utrecht (De Uithof).
Lecturers: Prof.dr. L. Stougie (VU University Amsterdam) and Dr. S. Canzar (Centrum Wiskunde en Informatica).

Aim:
To provide insight in theory and development of practical methods for basic and advanced linear programming.

Course description:
Part 1: Basic theory and algorithms of linear optimization:
- Linear optimization; polyhedra and polytopes; the simplex algorithm; duality; linear inequalities and Farkas' lemma; sensivity analysis.

Part 2: Advanced linear optimization methods:
- The revised simplex method and column generation; Dantzig-Wolfe- and Benders' decomposition; network flow problems; the ellipsoid method; an interior point method; integer programming formulations and solution methods.

Literature:
D. Bertsimas and J.N. Tsitsiklis: Introduction to linear optimisation, Athena Scientific, 1997.

Prerequisites:
Basic knowledge (bachelor level) of linear algebra and graph theory.

Examination:
Written examination.

Addresses of the lecturers:
Prof.dr. L. Stougie
Department of Econometrics and Operations Research
Faculty of Economics & Business Administration, VU University Amsterdam
De Boelelaan 1105, 1081 HV Amsterdam
Phone: 020 – 5989391
E-mail: lstougie@feweb.vu.nl

Dr. S. Canzar
CWI, Science Park 123, 1098 XG Amsterdam
Phone: 020-5924017
E-mail: s.canzar@cwi.nl

Course SCH: "Scheduling"

Time : Monday 13.15 – 15.00 (January 31 – April 18).
Location: Utrecht (De Uithof).
Lecturer: Prof.dr. J.L. Hurink (University of Twente).

Aim:
This course gives an introduction into scheduling theory and its applications.

Course description:
The term scheduling represents the assignment of resources over time to perform tasks, jobs or activities. Feasible schedules are compared with respect to a given optimality criterion. Mostly, the optimization problem is combinatorial and very complex. From a computational point of view these problems are hard (NP-hard) and the classical techniques fail in practice In this course an overview on the most classical scheduling models is given and exact as well as heuristic solution methods are discussed for these models.
In detail, the following issues are treated:
- Classification of scheduling models;
- Single-machine models;
- Parallel-machines models;
- Open shop, flow shop and job shop models;
- Timetabling;
- Transportation;
- On-line models.

Literature:
- Handout for special subjects.

The following books can be used as background and further information, but do not have to be bought:
- Pinedo, Michael L: Planning and Scheduling in Manufacturing and Services; Series: Springer Series in Operations Research and Financial Engineering, 2005, With CD-ROM., Hardcover, ISBN: 0-387-2198-0;
- Brucker, Peter: Scheduling Algorithms 4th ed., 2004, Springer Verlag Berlin, Hardcover, ISBN: 3-540-20524-1;
- Pinedo, Michael L: Scheduling: Theory, Algorithms, and Systems, 2nd ed., 2002, Prentice Hall, ISBN: 0-13-028138-7.

Prerequisites:
Basic knowledge (bachelor level) of analysis and linear algebra.

Examination:
Take home problems and an oral examination.

Address of the lecturer:
Prof.dr. J.L. Hurink
Department of Applied Mathematics, University of Twente, P.O. Box 217, 7500 AE Enschede
Phone: 053 – 4893447
E-mail: j.l.hurink@utwente.nl / URL: www.math.utwente.nl/~hurinkjl

Course QT: “Queueing Theory”

Time : Monday 15.15 – 17.00 (January 31 – April 18).
Location: Utrecht (De Uithof).
Lecturers: Dr.ir. W.R.W. Scheinhardt (University of Twente).

Aim:
To provide insight in the theory of queueing models.

Course description:
The following subjects will be treated:
- Fundamental queueing relations (Little's law, PASTA property);
- Markovian queues (M/M/1 queue, M/M/c queue, M/E_r/1 queue) ;
- M/G/1 queue and G/M/1 queue;
- Mean value technique;
- Priority queues;
- Variations of the M/G/1 queue;
- Insensitive queues (M/G/c/c queue and M/G/infinity queue).

Literature:
Lecture notes of the course "Queueing Theory" (free available: http://www.win.tue.nl/~iadan/queueing.pdf).

Prerequisites:
Basic knowledge of probability at the level: S.M. Ross, Introduction to probability models, 9th edition, Academic Press, 2007 (chapters 1-3).

Examination:
Written examination.

Address of the lecturer:
Dr. W.R.W. Scheinhardt
Department of Applied Mathematics, University of Twente, P.O. Box 217, 7500 AE Enschede
Phone: 053-4893832
E-mail: w.r.w.scheinhardt@utwente.nl / URL: www.math.utwente.nl/~scheinhardtwrw

6. Financial regulations

LNMB

The following arrangements hold.

1. Only PhD students who are preparing their thesis under supervision of a member of the LNMB (see the list in paragraph 12 of this booklet) are considered for financial aid.
2. The LNMB does not pay the PhD students directly; the payment will be done afterwards to the administration of the university of the PhD student. In order to receive the payment, a form has to be submitted. These forms are available at the LNMB secretary.
3. Reimbursements are intended for education activities such as courses and workshops.
   For participation in courses, 50% of the price of a second class train return ticket between the university location and Utrecht is reimbursed.
   For participation in the Lunteren conference there can be given a compensation for lodging with a maximum of 50 euro per conference or workshop.
4. The other expenses will be accounted to the PhD students or their universities.

NWO

NWO provides grants for research. There are grants for working visits and for attending conferences.
Information about these grants can be requested from NWO, phone: 070 - 3440624 (Grant Program Office).

NUFFIC

The Netherlands has cultural accords with various countries, which include arrangements for scientific co-operation and exchange. Scientific staff can obtain, under special conditions, a grant for short visits to other countries. The money originates from the Ministry OCW (Education, Culture and Science). NUFFIC takes care of the formalities. See also www.nuffic.nl/studie/beursopener.html

OTHER GRANTS

For information about other grants we refer to the administration of your own university. See also www.vsnu.nl

7. LNMB certificated persons (197)

J.M. van den Akker
E.M. Bázsa
M. Bijvank
C.A. Boer
S.C. Borst
G.M. te Brake
J.J.J. van de Broek
A. Bump
S.K. Cheung
U. Corbacioglu
Q. Deng
A.M. Dobber
T. Dollevoet
C.A. van Eijl
I. Endrayanto
O. Gabali
J.-W. Goossens
A. Grigoriev
R. de Haan
C.J.H. Hendriksen
B. Heydenreich
D. Huisman
V.C. Ivanescu
B. Jansen
E. Janssen
B. Kaynar
M.J. Kleijn
F. Klijn
J. de Kort
M. Koster
M.G.C. van Krieken
T. Le Anh
H.L. Liem
J.A. Loeve
F.J.W. Lutgens
H. Mansouri
N.A.A. Marquinie
F.J.C. van Megen
G. Mincsovics
R. Nicolai
N.J. Olieman
G.J.M. Otten
Ö. Özdemir
O. Passchier
N. Piersma
S.A. Pot
M. Quant
G. Rennen
D. Roubos
A.Y.D. Siem
M. Slikker
M.A.J. Smith
M.J. Soomer
J.M. Spitter
M. Tennekes
A. Ule
S.G. Vanneste
M. Verloop
A.P.A. Vestjens
M. Vlasiou

M.E. Angün
R. Bekker
H.M. le Blanc
K.M.J. de Bontridder
R.J. Boucherie
R.C.M. Brekelmans
J. Bruin
N.C. Büyükkaramikli
T.J.M. Coenen
M. Cremers
A.B. Dieker
C. Dobre
A.B. Dragut
E. Elabwabi
A. Estevez Fernandez
S.M. Geervliet
F.N. Gouweleeuw
E.A. Grigorieva
A. Haesel
D. den Hertog
W.B. van den Hout
B.G.M. Husslage
I.D. Ivanov
J.B. Jansen
F.B.S.L.P. Janssen
O.A. Kilic
J. Kleppe
A.L. Kok
P. Korteweg
S. Kovaleva
B.H.M. Kuijpers
T. Le Duc
P. Lieshout
R.B. Lok
M. Mainegra Hing
S. Marban
P.J.M. Meersmans
R.D. van der Mei
D.I. Miretskiy
L. van Norden
M. Oosten
P. Out
U. Özen
J.J. Paulus
P.C. Pop
D. Potthoff
A.J. Quist
M. Retel Helrich
J.H.G.C. Rutten
B.P. Silalabi
E. Smeitink
S.R. Smits
P.F. Spaans
M.H. Streutker
R.H. Teunter
R.J.M. Vaessens
H.J.J. Verheijen
A.J. Vermeulen
M. Vieira
M.H. van der Vlerk

A. Asadi
S. Bhulai
J.M. Bloemhof – Ruwaard
N.K. Boots
Y. Boulaksil
M.P. de Brito Peirera Maduro
G. Budai
D. Chaerani
M.B. Combé
F.C.A.M. Cruijssen
E.B. Diks
M.K. Dogru
R. Egorova
M. Elghami
M. Firat
J.R.G. van Gellekom
R.M.P. Goverde
G. Gu
R. Haijema
W. van den Heuvel
G.-J.J.J.A.N. van Houtum
L.J.J. van Iersel
W. van Jaarsveld
M. Jansen
R.P. Kampstra
B.-E. Klaus
E. de Klerk
G.M. Koole
A.M.C.A. Koster
A.F. van der Kraaij
C.M.H. Kuijpers
R.L.M.J. van Leensel
O. Listes
J.M.W. van Loon
M.R.H. Mandjes
B. Marchal
M.A. Meertens
W.J.M. Meuffels
M. Mnich
R. Núñez Queija
D. van Ooteghem
P. Ouwehand
K. Pak
L.W.P. Peeters
E. Porras Musalem
M. Pourakbar
J.H. Reijnierse
D. Romero Morales
B. Selçuk
A. Sleptchenko
J. Smeltink
M. Sol
F.C.R. Spieksma
J.F. Sturm †
M.J.G. van Uitert
P.T. Vanberkel
C. Verhoef
A.M. Verweij
I.F.A. Vis
I. Vliegen

A. van Vliet
T. Vredeveld
X. Wang
A.C.C. van Wijk
R. Yang
C.M. Zwaneveld

J.P.A. van Vliet
M.J.C.M. Vromans
M. Wennink
R. Wildeman
Z. Yang
A.P. Zwart

Y. Volkovich
M. van Vuuren
W. van der Weij
E.M.M. Winands
T. Yuan

8. Structuurschets interne organisatie LNMB (in Dutch)

Vastgesteld in de algemene ledenvergadering van 16 januari 1991, aangepast in de algemene ledenvergadering van 16 januari 2007

0. Preambule
De juridische structuur van het LNMB is nog niet vastgelegd, en dat gebeurt ook niet door onderstaande structuurschets. Op dit moment is het niet opportuun om de juridische aspecten volledig uit te werken, dat zal te zijner tijd gebeuren in samenhang met de uitwerking van de structurele financiering. Bovendien is het wenselijk om te wachten tot de discussie over "onderzoekscholen" verder gevorderd is. Wel is het op dit moment noodzakelijk om interne gedragsregels af te spreken, onder meer omdat de hoogleraar-directeur is aangesteld.

1. Het Landelijk Netwerk Mathematische Besliskunde
Het LNMB is een organisatie die een landelijke tweede-fase onderzoekersopleiding in de mathematische besliskunde verzorgt. Door landelijke bundeling van internationaal erkende expertise en door inzet van vooraanstaande onderzoekers uit het buitenland wordt gestreefd naar een opleiding van hoge kwaliteit. Het LNMB streeft naar een goede afstemming van activiteiten met de universitaire instellingen en met andere tweede fase opleidingen.

2. Leden
Lid van het LNMB kunnen zijn hoogleraren of UHD's (inclusief emeriti) van de Nederlandse universiteiten of medewerkers van het CWI, die actief onderzoeker zijn op een van de deelgebieden van de mathematische besliskunde, en betrokken zijn bij de begeleiding van aio's/oio's. De ledenlijst staat vermeld in de brochure. Over toelating van nieuwe leden beslist het Algemeen Bestuur.

3. Algemeen Bestuur
Het Algemeen Bestuur bestaat uit tenminste n en ten hoogste $n+m$ leden van het LNMB, waar n = het aantal instellingen waar leden werkzaam zijn en m = het aantal leden van het Dagelijks Bestuur. Het Algemeen Bestuur wordt gekozen door de Ledenvergadering zodanig dat van elk van de n instellingen tenminste één personeelslid lid van het Algemeen Bestuur is. Leden van het Dagelijks Bestuur zijn automatisch lid van het Algemeen Bestuur. De voorzitter wordt in functie gekozen. De Wetenschappelijk Directeur is secretaris. Het Algemeen Bestuur verdeelt onderling de overige functies. Leden van het Algemeen Bestuur die geen lid zijn van het Dagelijks Bestuur treden jaarlijks af, en zijn terstond herkiesbaar. Voor de overige leden van het Algemeen Bestuur geldt het rooster van bestuursmutaties van het Dagelijks Bestuur.
Het Algemeen Bestuur heeft tot taak:
a. Het benoemen van nieuwe leden van het LNMB;
b. Het benoemen van de Wetenschappelijk Directeur;
c. Het toezien op de activiteiten van het Dagelijks Bestuur;
d. Het jaarlijks vaststellen van het algemeen en financieel verslag, alsmede van de begroting voor het komende jaar;
e. Alles te doen wat de doelstellingen van het LNMB kan bevorderen.

4. Dagelijks Bestuur
Het Dagelijks Bestuur bestaat uit 5 of 6 leden van het LNMB. Het Dagelijks Bestuur wordt gekozen door de Ledenvergadering. Voorzitter en secretaris van het Algemeen Bestuur zijn tevens voorzitter en secretaris van het Dagelijks Bestuur. De zittingstermijn van de secretaris komt overeen met diens aanstelling als Wetenschappelijk Directeur. De voorzitter wordt in functie gekozen.
De leden van het Dagelijks Bestuur, m.u.v. de directeur, hebben een zittingstermijn van 4 jaar. Jaarlijks treedt tenminste één lid af. Aftredende leden zijn éénmaal herkiesbaar.
Het Dagelijks Bestuur heeft tot taak:
a. Het vaststellen van het onderwijsprogramma van het LNMB, in het bijzonder de aanwijzing van de docenten;
b. Het vaststellen van regels voor de beoordeling van de deelnemende aio's/oio's door de docenten en het vaststellen van slaagregels;
c. Het vaststellen van cursusgelden, contributies, vergoedingen etc.;
d. Het vaststellen van regelingen voor diploma's, en het afgeven van diploma's aan deelnemers die geslaagd zijn;
e. Het jaarlijks uitbrengen van een begroting, ten behoeve van het Algemeen Bestuur;

f. Het zorgdragen voor de continuïteit van de activiteiten van het LNMB; inhaken op actuele ontwikkelingen, het veilig stellen van structurele financiering etc.;
g. Het adviseren van de Wetenschappelijk Directeur bij diens taakuitoefening;
h. Alles te doen wat de doelstellingen van het LNMB kan bevorderen.

Het Dagelijks Bestuur is verantwoording verschuldigd aan het Algemeen Bestuur en aan de Ledenvergadering.

5. Wetenschappelijk Directeur

Het LNMB heeft een Wetenschappelijk Directeur. De functie van Wetenschappelijk Directeur wordt op hoogleraarniveau vervuld. De Wetenschappelijk Directeur wordt benoemd door het Algemeen Bestuur, in samenwerking met de penvoerende instelling. De termijn van de aanstelling wordt eveneens in overleg met de penvoerende instelling vastgelegd.

De Wetenschappelijk Directeur heeft tot taak:

a. Het voorbereiden en doen uitvoeren van het onderwijsprogramma;
b. Het beslissen omtrent toelating van deelnemers aan het onderwijsprogramma op grond van door het Dagelijks Bestuur vastgestelde regels;
c. Het bijhouden van een administratie van deelnemers aan het onderwijsprogramma, en de door hen behaalde resultaten;
d. Het toezicht houden op het financieel beheer dat namens het LNMB wordt gevoerd;
e. Het voorbereiden van de vergaderingen van het Dagelijks Bestuur, het Algemeen Bestuur en de Ledenvergadering;
f. Het opstellen van voorlichtingsmateriaal voor aio's/oio's en andere belangstellenden;
g. Het verzorgen van goede contacten met de penvoerende instelling, met deelnemende aio's/oio's en hun promotoren, met docenten, met instellingen die bij het LNMB zijn betrokken,en met verwante netwerken.

De Wetenschappelijk Directeur is verantwoording verschuldigd aan het Dagelijks Bestuur.

6. Ledenvergadering

Ieder kalenderjaar, bij voorkeur tijdens de jaarlijkse Lunteren-conferentie, wordt een Ledenvergadering gehouden, waar onder meer aan de orde komen:

a. Het algemeen verslag over het afgelopen kalenderjaar;
b. De plannen voor het komende kalenderjaar.

De Ledenvergadering heeft verder tot taak:

c. De benoeming van de leden van het Dagelijks Bestuur en van het Algemeen Bestuur;
d. Het vaststellen van de gedragregels die binnen het LNMB worden gehanteerd.

7. Financiën

Voor de periode 1989 - 1993 heeft de Minister van Onderwijs en Wetenschappen het LNMB een startsubsidie toegekend. Daarna hebben de instellingen via een jaarlijkse bijdrage gezorgd voor het voortbestaan van het LNMB. De gelden wordt beheerd door de penvoerende instelling. Betalingen behoeven de goedkeuring van de Wetenschappelijk Directeur, die gehouden is aan regels die door het Dagelijks Bestuur zijn vastgelegd.

8. Slot

In alle gevallen waarin deze regels niet voorzien, beslist het Dagelijks Bestuur.

9. Operations Research Groups at Dutch Universities and CWI

Nr.	Institution	Research Theme	Projectleader(s)
1a.	CWI	Algorithms, Combinatorics and Optimization	Laurent
1b.	CWI	Communication and computer networks	Van der Mei
2.	EUR	Operations Research	Dekker
3.	WUR	Operations Research	Van der Vorst
4a.	UvT	Operations Research	Van Dam
4b.	UvT/RU	Operations Research and game theory	Borm/Tijs
5a.	UM	Combinatorial optimization	Van Hoesel
5b.	UM	Game theory and optimization	Thuijsman
6.	RUG	Operations Research	Van der Vlerk
7.	UL	Stochastic Operations Research	Kallenberg
8a.	TUD	Interior point methods	Roos
8b.	TUD	Optimization	Aardal
9.	TU/e	Combinatorial optimization and Stochastic OR	Woeginger/Boxma
10.	UvA	Deterministic and Stochastic Operations Research	Van Dijk
11.	UT	Discrete Optimization and Stochastic OR	Boucherie/Uetz
12.	UU	Operations Research	Balder
13a.	VU	Combinatorial Optimization and Stochastic OR	Stougie/Tijms
13b.	VU	Optimization of business processes	Koole

Project 1a. Centre for Mathematics and Computer Science (CWI) Algorithms, Combinatorics and Optimization

Leader : Prof.dr. M. Laurent.
Address : Centre for Mathematics and Computer Science, Science Park 123, 1098 XG Amsterdam.
Phone : 020 - 5924105; 020 - 5924189 (secretary).
Research staff : Prof.dr.ir. K.I. Aardal, prof.dr. K. Apt, dr. X. Buchwalder, dr. J. Draisma, prof.dr.ir. A.M.H. Gerards, dr. D.C. Gijswijt, B. de Keijzer, prof.dr. M. Laurent, prof.dr. J.K. Lenstra, dr. T. Mueller, dr. F.M. de Oliveira Filho, G. Regts, prof.dr. G. Schaefer, prof.dr. A. Schrijver, F. Sietsma, dr. O. Telelis, dr. F. Vallentin, A. Varvitsiotis, dr. S. van Zwam.

Research themes:
1. Combinatorics and optimization;
2. Algorithmic game theory.

Project 1b. Centre for Mathematics and Computer Science (CWI) Probability and Stochastic Networks

Leader : Prof.dr. R.D. van der Mei.
Address : Centre for Mathematics and Computer Science, Science Park 123, 1098 XG Amsterdam
Phone : 020 - 5924205; 020 - 5924199 (secretary)
Research staff : Prof.dr. J. van den Berg (0.8), dr. K. Dzhaparidze (1.0), drs. R. Egorova (1.0), ir. G.J. Hoekstra (0.4), dr. M.C. van Lieshout (1.0), drs. P.M.D. Lieshout (1.0), prof.dr. R.D. van der Mei (0.8), dr. R. Núñez Queija (0.5), dr. A. Saposznikov (1.0), dr. V. Sidoravicius (1.0), C. Verhoef (1.0), drs. M. Verloop (1.0), drs. W. van der Weij (1.0) and dr. A.P. Zwart (1.0).

Research themes:
1. Performance analysis of communication systems;
2. Spatial stochastics and stochastic processes;
3. Stochastic geometry.

Project 2. Erasmus University Rotterdam Operations Research

Leader : Prof.dr.ir. R. Dekker.
Address : Econometric Institute, H11-33, Erasmus University Rotterdam, Postbus 1738, 3000 DR Rotterdam
Phone : 010 – 4081274; 010 – 4081264 (secretary).
Research staff : Dr. J. Brinkhuis, prof.dr.ir. R. Dekker, dr. W. van der Heuvel, dr. D. Huisman, dr. A. Gabor, prof. dr. ir. U. Kaymak, dr. D.K. Leegwater, dr. M. Mulder, C. Pince MSc, D. Potthoff MSc, M. Pourakbar MSc, M. Retel Helmrich MSc, R. Spliet MSc, W. van Jaarsveld MSc, prof.dr. A.P.M. Wagelmans.

Research themes:

1. Railway operations optimization (Budai, Dekker, Huisman, Potthoff, Wagelmans);
2. Maintenance and reliability analysis (Dekker, Budai, Frenk, Nicolai);
3. Revenue management (Dekker, Frenk, Pak);
4. Production planning and inventory control (Dekker, Van de Heuvel, Retel-Helmrich, Wagelmans);
5. Service Logistics (Dekker, Pince, Pourakbar);
6. Lotting strategies in Combinatorial Auctions (Dekker, Kaymak, Waltmans);
7. Container and intermodal logistics (van Asperen, Dekker, Pourakbar);
8. OR in Medical Decision Making (Dekker);
9. Reverse logistics (Dekker, van de Heuvel, Pince);
10. Location and network problems (Mulder).

Project 3. Wageningen University
Operations Research and Logistics Group

Leader : Prof.dr.ir. J.G.A.J. van der Vorst.
Address : Hollandseweg 1, 6706 KN Wageningen.
Phone : 0317 – 485645.
Research staff : A. Banaszewska MSc, X. Bing MSc, Dr. J.M. Bloemhof-Ruwaard, Ir. G.D.H. Claassen, dr. R. Haijema, Dr. E.M.T. Hendrix, ir. J.C. van Lemmen-Gerdessen, drs. K.G.J. Pauls-Worm, W. Rijpkema MSc, dr. R. Rossi, J. Vlajic MSc and prof.dr.ir. J.G.A.J. van der Vorst.

Research themes:

1. Supply chain management and design:
   a. Robust demand-driven Agrifood chain networks;
   b. Quality controlled logistics in fresh networks.
2. Decision support models:
   a. OR-models for Agribusiness and food industry;
   b. Ontology's and modelling frameworks for simulation studies.
3. Efficient and effective algorithms:
   a. Planning algorithm for Agrifood;
   b. Algorithm for robust design; application of global optimization algorithms.

Project 4a. Tilburg University
Operations Research

Leader : Prof.dr.ir. E.R. van Dam
Address : Department of Econometrics and Operations Research, CentER for Economic Research, Faculty of Economics and Business Administration, Tilburg University, P.O. Box 90153, 5000 LE Tilburg.
Phone : 013 – 4662430
Research staff : Prof.dr. H.A. Akkermans, prof.dr.ir. J. Ashayeri, dr. B.W.M. Bettonvil, dr. J.P.C.Blanc, prof.dr. P.E.M. Borm, dr. R.C.M. Brekelmans, prof. dr.ir. E.R. van Dam, prof.dr.ir. H. Daniels, dr. F.M. De Oliveira Filho, prof. dr. A.M.B. De Waegenaere, prof.dr. F.A. van der Duyn Schouten, dr. J.C. Engwerda, prof.dr.ir. H.A. Fleuren, dr.ing. W.J.H. van Groenendaal, dr. Gul Gurkan, prof.dr.ir. W.H. Haemers, prof.dr. H.J.M. Hamers, prof.dr.ir. D. den Hertog, dr. K.J.M. Huisman, prof.dr. G. Kant, prof.dr. J.P.C. Kleijnen, prof. dr. E. de Klerk, prof.dr. P.M. Kort, prof.dr. M. Laurent, dr. M. Nagy, dr.ir. M.J.P. Peeters, dr. M. Quant, dr. J.H. Reijnierse, prof.dr. J.M. Schumacher, dr. R. Sotirov, prof.dr. A.J.J. Talman.

Research themes:

1. Stochastic Operations Research;
2. Deterministic Operations Research;
3. Simulation;
4. Combinatorial mathematics;
5. Cooperative game theory.

Project 4b. Tilburg University
Operations Research and Game theory

Leaders : Prof.dr. P.E.M. Borm.
Address : Department of Econometrics and Operations Research, CentER for Economic Research, Faculty of Economics and Business Administration, Tilburg University, P.O. Box 90153, 5000 LE Tilburg.
Phone : 013 - 4663026; 013 - 4662340 (secretary)
Research staff : Prof. dr. P.E.M. Borm, drs. M. Carvalho, drs. O. Clzek, drs. M. Groote Schaarsberg, drs. S. Grundel, prof. dr. H.J.M. Hamers, dr. R. Hendrickx, dr. J. Kleppe, drs. R. Lindelauf, drs. E. Lohmann, prof. dr. H.W. Norde, dr. M. Quant, dr. H. Reijnierse, drs. T. Suzuki, prof.dr. A.J.J. Talman.

Research themes:
1. Cooperative game theory;
2. Non-cooperative game theory;
3. Mathematical economics;
4. Skill in games;
5. Overt and covert network analysis.

Project 5a. Maastricht University
Combinatorial optimization

Leader : Prof.dr.ir. C.P.M. van Hoesel.
Address : Department of Quantitative Economics, Faculty of Economics, Maastricht University, P.O. Box 616, 6200 MD Maastricht.
Phone : 043 - 3883727; 043 - 3883835 (secretary).
Research staff : Dr. A. Berger, dr. A. Grigoriev, prof.dr.ir. S. van Hoesel, prof.dr. R. Müller, dr. H. Röglin and dr. T. Vredeveld.

Research themes:
1. Mechanisme design, combinatorial auctions;
2. Network optimization;
3. Planning and scheduling;
4. Approximation;
5. Pricing, Revenue Management;
6. Supply Chain Management.

Project 5b. Maastricht University
Game Theory and Optimization

Leader : Dr. F. Thuijsman.
Address : Department of Knowledge Engineerings, Maastricht University, P.O. Box 616, 6200 MD Maastricht.
Phone : 043 - 3883489; 043 - 3883496 (secretary).
Research staff : Dr. J.J.M. Derks, drs. J. Heijman, dr. M. Hoffmann, drs. S. Jansen, drs. J.M.H. Karel, dr.ir. J.Kuipers, prof.dr.ir. R.L.M. Peeters, dr. M. Petreczky, dr. G.M. Schoenmakers, dr. F. Thuijsman, P. Uyttendaele MSc and dr. R.L. Westra.

Research themes:
1. Strategic optimization in networks (network games, Markov games, gene networks, evolutionary models);
2. Systems biology (signal processing, data mining, pattern recognition).

Project 6. University of Groningen
Operations Research

Leader : Prof.dr. R.H. Teunter.
Address : Faculty of Economics and Business, University of Groningen, P.O. Box 800, 9700 AV Groningen.
Phone : 050 - 3638617; 050 - 3637491 (secretary).
Research staff : Drs. Serra Caner, Dr. B. Goldengorin, prof.dr. W.K. Klein Haneveld, D. Krushinsky MSc, prof.dr. G. Sierksma, drs. M.H. Streutker, drs. B.G. Talsma, prof.dr. R.H. Teunter and prof.dr. M.H. van der Vlerk.

Research themes:
1. Decision making under uncertainty and Stochastic programming (Cremers, Klein Haneveld, Streutker, van der Vlerk);
2. Combinatorial optimization and quantitative logistics (Goldengorin, Schakel, Sierksma, Talsma);
3. Reverse logistics, spare parts management, inventory control and forecasting of demand (Caner, Teunter).

Project 7. University of Leiden
Stochastic Operations Research

Leader : Dr. F.M. Spieksma.
Address : Mathematical Institute, University of Leiden, P.O. Box 9512, 2300 RA Leiden.
Phone : 071 – 5277128.
Research staff : Dr. F.M. Spieksma.

Research themes:
1. Markov decision chains with applications in queueing networks;
2. Markov games;
3. Stability properties of parametrised collections of Markov chains with applications to queueing.

Project 8a. Delft University of Technology
Interior point methods

Leader : Prof.dr.ir. C. Roos
Address : Faculty of Electrical Engineering, Mathematics and Computer Science, Delft University of Technology, Mekelweg 4, 2628 CD Delft
Phone : 015 - 2782530; 015 - 2787486 (secretary)
Research staff : A. Asadi MSc., ir. H.N. Post, B.P. Silalahi MSc. and M. Zangiabadi MSc.
Research themes:
1. Interior point methods for linear and non-linear optimization;
2. Randomized (approximation) algorithms;
3. Robust optimization.

Project 8b. Delft University of Technology
Interior point methods

Leader : Prof.dr.ir. K.I. Aardal
Address : Faculty of Electrical Engineering, Mathematics and Computer Science, Delft University of Technology, Mekelweg 4, 2628 CD Delft
Phone : 015 - 2785093; 015 - 2784109 (secretary)
Research staff : K.I. Aardal, F. von Heymann, D. Sverdlov and F. Vallentin.
Research themes:
1. Integer and combinatorial optimization;
2. Semidefinite/convex optimization;
3. Harmonic analysis applied to optimization, lattices and optimization.

Project 9. Eindhoven University of Technology
Combinatorial optimization; Stochastic Operations Research

Leaders : Prof.dr. G.J. Woeginger and prof.dr.ir. O.J. Boxma.
Address : Department of Mathematics and Computer Science, Eindhoven University of Technology, P.O. Box 513, 5600 MB Eindhoven
Phone : 040 - 2472412 (Woeginger); 040 - 2472858 (Boxma); 040 - 2473130 (secretary)
Research staff : Dr.ir. I.J.B.F. Adan, drs. R. Bierbooms, ir. M.A.A. Boon, prof.dr.ir. S.C. Borst, ir. N. Bouman, prof.dr.ir. O.J. Boxma, drs. J.L. Dorsman, drs. C.E.J. Eggermont, M. Firat MSc., dr. H. van der Holst, dr.ir. C.A.J. Hurkens, dr. M.T.S.Jonckheere, dr. J.C.M. Keijsper, dr. J.S.H. van Leeuwaarden, prof.dr. J.K. Lenstra, dr. A. Löpker, M. Mnich MSc., dr. R.A. Pendavingh, dr. J.A.C. Resing, ir. P.M. van de Ven, dr. M. Vlasiou, ir. A.C.C. van Wijk and prof.dr. G.J. Woeginger.
Research themes:
1. Combinatorial optimization;
1.1. Graph and matroid structure theory;
1.2. Complexity and approximation;
1.3. Enumerative optimization;
1.4. Optimization under uncertainty;
2. Stochastic operations research;
2.1. Random walks and queueing theory;
2.2. Performance analysis of computer- and communication systems;
2.3. Performance analysis in operations management and logistics;
3. The EURANDOM program on Queueing and Performance Analysis.

Project 10. University of Amsterdam
Deterministic and Stochastic Operations Research

Leader : Prof.dr. N.M. van Dijk.
Address : Department of Econometrics, Faculty of Economics and Econometrics, University of Amsterdam, Roetersstraat 11, 1018 WB Amsterdam.
Phone : 020 - 5254215; 020 - 5254217 (secretary)

Research staff : Drs. A. Al-Ibrahim, Prof.dr. N.M. van Dijk, dr. C.W. Duin, ir. J.A.M.Hontelez, drs. P. Joustra, dr. H.J.J. van der Sluis, dr. A. Volgenant and prof.dr.ir. J. van der Wal.

Research themes:

1. Markov decision theory (Al-Ibrahim, Haijema, van der Wal, van Dijk);
2. Performance analysis of service networks (van Dijk, van der Sluis);
3. Exact and bounding results for queueing networks (van Dijk);
4. Scheduling algorithms and complexity (Duin, van der Sluis);
5. Traveling salesman problem and variants (Volgenant);
6. Graph theory problems (Duin, Volgenant);
7. Polyhedral methods (Volgenant);
8. Inventory models (van der Sluis, van der Wal);
9. Transportation (Al-Ibrahim, Haijema, van Dijk,van der Wal);
10. Daily life applications of stochastic models (van Dijk, van der Sluis);
11. Healthcare (Haijema, Hontelez, van Dijk, van der Wal);
12. OR and simulation (van Dijk, van der Sluis, van der Wal);
13. OR and simulation (van Dijk, van der Sluis).

Project 11. University of Twente
Discrete Optimization and Stochastic Operations Research

Leaders : Prof.dr. R.J. Boucherie and prof.dr. M. Uetz.
Address : Faculty of Electrical Engineering, Mathematics & Computer Science, University of Twente,
P.O. Box 217, 7500 AE Enschede.
Phone : 053- 4893402; 053- 4893434 (secretary).
Research staf : F. Ahmed MSc, J.W.H. van Bloem MSc, ir. M.J. Bomhoff, M.G.C. Bosman MSc, H.C.M. Bossers MSc, prof.dr. R.J. Boucherie, prof.dr.ir. H.J. Broersma, dr.ir. T.S.H. Driessen, ir. T. van Essen, Y. Feng MSc, ir. J. Goseling, dr. M. de Graaf, prof.dr. J.L. Hurink, dr. W. Kern, N. Kortbeek MSc, dr. N. Litvak, dr. B. Manthey, dr. J.C.W. van Ommeren, dr.ir. G. Post, X. Qiu MSc, D. Reijsbergen MSc., dr.ir. W.R.W. Scheinhardt, dr. G.J. Still, prof.dr. M. Uetz, P. Vanberkel MSc, dr. J.B. Vink-Timmer, J. Wu MSc, M. Zonderland MSc. and A. Zwartjes MSc

Research themes:

1. Discrete Mathematics, Mathematical Programming and Stochastic Operations Research:
   - Combinatorial optimization, approximation algorithms, online algorithms, continuous optimization, graph theory, scheduling, timetabling, routing, pricing.
2. Game Theory:
   - Cooperative game theory, noncooperative game theory, stochastic game theory, algorithmic game theory, mechanism design.
3. Stochastic Operations Research:
   - Telecommunication systems, queuing network analysis, large deviations, fluid models, pricing, wireless networks, IP networks.
4. Supply chain management:
   - Manufacturing, scheduling, logistics, inventory models, reliability, maintenance, spare parts planning and control.
5. Health care logistics.

Project 12. University of Utrecht
Operations Research

Leader : Prof.dr.ir. E.J. Balder
Address : Department of Mathematics, University of Utrecht, Budapestlaan 6, 3508 TA Utrecht.
Phone : 030 - 2531458; 030 - 2531420 (secretary)
Research staff : Prof.dr.ir. E.J. Balder and dr. A. Gnedin.
Research themes:

1. Generalized solutions in game theory, optimal control and mathematical economics;
2. Probabilistic methods in combinatorics;
3. Search and sorting algorithms.

Project 13a. VU University Amsterdam
Combinatorial Optimization and Stochastic Operations Research

Leaders : Prof.dr. L. Stougie
Address : Department of Econometrics and OR, VU University Amsterdam,
De Boelelaan 1105, 1081 HV Amsterdam
Phone : 020 - 5986013
Research staff : Dr. G.J. Franx, dr. J. Gromicho, dr. B. Heidergott, B. Kaynar MSc., dr. D.A. van der Laan, dr. R.D. Nobel, dr. A.A.N. Ridder, prof.dr. G. Schaefer, dr.ir. R.A. Sitters, prof.dr. L. Stougie, prof.dr. G.T. Timmer and W. Wolk-Makarewicz MSc.
Research themes:

1. Combinatorial Optimisation;
1.1. Algorithms: complexity and approximation;
1.2. Algorithmic game theory;
1.3. On-line algorithms;
1.4. Computational biology;
2. Stochastic Operations Research;
2.1. Markov decision algorithms for controlled queuing systems;
2.2. Analysis and simulation of probabilities for rare events;
2.3. Perturbation analysis and simulation techniques;
2.4. Numerical algorithms based on Taylor series expansion;
2.5. Stochastic programming.

Project 13b. VU University Amsterdam
Optimization of Business Processes

Leader : Prof.dr. G.M. Koole
Address : Department of Mathematics, VU University Amsterdam,
De Boelelaan 1081a, 1081 HV Amsterdam
Phone : 020 - 4447755
Research staff : Dr. R. Bekker, dr. S. Bhulai, M. Calinescu, A. Haensel, prof.dr. R.D. van der Mei, drs. P. Out,V. Rai MSc., drs. A. Roubos, drs. D. Roubos, drs. R. Yang and prof.dr. A.P. Zwart.
Research themes:

1. Performance modeling of communication systems;
2. Theory and applications of controlled queueing systems.

10. List of PhD Students

1	Al-Ibrahim, Drs. A.	Universiteit van Amsterdam	Faculteit Economie en Bedrijfskunde
2	Alvarez, E.	University of Twente	School of Management and Governance
3	Arts, Ir. J.J.	Einhoven University of Technology	
4	Asadi, A.	Delft University of Technology	EWI Room HB 07-160
5	Banaszewska, MSc. A.	Wageningen University	Dep. Logistics, Decision and Information Sciences
6	Bierbooms, MSc. J.J.P.H.	Eindhoven University of Technology	Dept. of Mathematics & Computer Science
7	Bloem, MSc. J.W.H. van	University of Twente	Gebouw Zilverling
8	Boer, Drs. A.V. den	CWI Amsterdam	
9	Bomhoff, Matthijs	University of Twente	Dept. of Applied Mathematics
10	Bosman, Joost	CWI Amsterdam	
11	Bossers, MSc. Harm	University of Twente	EWI
12	Bouma, MSc. Harmen	University of Groningen	
13	Bouman, N.	CWI Amsterdam	
14	Bruin, drs. J.	Eindhoven University of Technology	EURANDOM
15	Büyükkaramikli, Cagdas	Eindhoven University of Technology	Department of Technology Management
16	Calinescu, MSc. M.	Vrije Universiteit Amsterdam	Business mathematics and informatics
17	Caner, Serra	University of Groningen	Fac. of Economics & Business
18	Chen, C.M.	Erasmus University Rotterdam	Rotterdam School of Management
19	Coenen, Ir. Tom	University of Twente	Capitool E104
20	Corbacioglu, U. MSc.	RSM Erasmus University Rotterdam	Decision and Information Science
21	Curseu, A. MSc.	Eindhoven University of Technology	Dept. of Technology Management
22	Dabia, Ir. S.	Eindhoven University of Technology	Department of Technology Management
23	Dickinson, MSc. P.J.C.	University of Groningen	Johann Bernoulli Institute for Mathematics and Computer Science,
24	Dimitrova, MSc. D.	University of Twente	EWI
25	Diris, MSc. B.	University of Maastricht	Department Quantitative Economics
26	Dobre, C.	Tilburg University	
27	Dollevoet, MSc. T.	Erasmus University Rotterdam	Econometric Institute
28	Driesen, Drs. B.	Maastricht University	Department of Quantitative Economics
29	Eggermont, Drs. C.	Eindhoven University of Technology	Department of Mathematics & Computer Science
30	Ensinck, H. Ir.	Maastricht University	Quantitative Economics
31	Essen, Ir. Theresia van	University of Twente	EWI
32	Evers, L. MSc.	Erasmus Universiteit	
33	Filatova, MSc. T.	University of Twente	
34	Firat, MSc. M.	Eindhoven University of Technology	Mathematics and Computer Science
35	Frolkova, M.	CWI	
36	Gabali, O.	Eindhoven University of Technology	Pav. E17
37	Gharehgozli, Amir	Erasmus University	Rotterdam School of Management
38	Glorie, Kristiaan	Erasmus University Rotterdam	
39	Gorissen, BSc. B.	Tilburg University	
40	Groot, Noortje	Delft University of Technology	
41	Groote Schaarsberg, M. MSc.	Tilburg University	
42	Haensel, Alwin	VU Amsterdam	
43	Haneyah, Sameh	University of Twente	Industrial Engineering & Management – Logistics
44	Hellings, Ton	CWI/UvA	
45	Heuvel, MSc. F.P. van den	Eindhoven University of Technology	Pav E 09
46	Heymann, F. von	Delft University of Technology	Faculty EEMCS
47	Hilbers, MSc. P.	Tilburg University	Department EOR
48	Hoen, MSc. Kristel	Eindhoven University of Technology	Pav. E15
49	Hoorn, drs. J. van	VU Amsterdam	FEWEB
50	Hulshof, Ir. Peter	University of Twente	MB-OMPL
51	Hurk, Evelien van der	Erasmus University Rotterdam	School of Management
52	Hutzschenreuter, A.	Eindhoven University of Technology	Dept. of Technology Management
53	Ivanovs, MSc. I.	Eindhoven University of Technology	Eurandom
54	Jaarsveld, W. van	Erasmus University	Econometric Institute
55	Jackels, MSc. B.	RSM Erasmus University	Rotterdam School of Management

56	Jalil, M.	RSM Erasmus University Rotterdam	Dept. of Decision & Information Sciences
57	Jancura, P.	Radboud University Nijmegen	Intelligent systems, FNWI
58	Jansen, Bart	University of Utrecht	Dept. of Information & Comp. Sciences
59	Jansen, Ir. M.	Eindhoven University of Technology	Faculty of Management Technology
60	Ju, S.	Eindhoven University of Technology	Dept. of Technology Management
61	Karaarslan, MSc. A. G.	Eindhoven University of Technology	Department of Technology Management
62	Karel, J.M.H.	Maastricht University	Dept of Knowledge Engineering
63	Karsten, F. MSc.	Einhoven University of Technology	Pav. E11
64	Kaynar, MSc. B.	Vrije Universiteit Amsterdam	Faculteit der Econ. Wetenschappen & Bedrijfskunde
65	Keijzer, Bart de	CWI	
66	Kemper, drs. B.P.H.	University of Amsterdam	
67	Khropova, Yulia	Eindhoven University of Technology	
68	Kilic, O.A.	University of Groningen	Faculty of Economics and Business
69	Kleppe, J.	Tilburg University	Operations Research
70	Kok, A.L.	University of Twente	Faculty of Management & Governance
71	Koochaki, J.	University of Groningen	Faculty of Economics and Business
72	Korkmaz, E.	Erasmus University	Rotterdam School of Management
73	Kortbeek, MSc. N.	University of Twente	Faculty of El. Engineering, Math. & Comp. Sciences
74	Kourmpetis, Y.	Wageningen University	Mathematics and Statistics Group, Biometris
75	Krushinsky, D.	University of Groningen	Faculty of Economics and Business
76	Langestraat, R. MSc.	Tilburg University	Departement Etrie
77	Larco, MSc. J.A.	Erasmus University Rotterdam	Room T 10-34
78	Larsen, G.K.H. MSc.	University of Groningen	
79	Lee, J. MSc.	Maastricht University	Dept. of Quantitative Economics
80	Lohmann, MSc. E.	Tilburg University	EOR Department Room K518
81	Ma, Ir. Y.	RSM Erasmus University	Rotterdam School of Man.
82	Ma, N.	Tilburg University	Operations Research & Management Science
83	Maas, Pepijn	Eindhoven University of Technology	
84	Madadi, MSc. A.	University of Groningen	Faculty of Economics and Business
85	Mahdavi, Mahdi	Erasmus University of Rotterdam	
86	Mahr, T.	1039 Budapest	AITIA International
87	Mao, MSc. X.	University of Maastricht	Department of Computer Science
88	Maqsood, MSc. A.	University of Tilburg	Department of Operations Research
89	Marb?n, MSc. S.	Maastricht University	Fac. of Economics & BA
90	Marchal, ir. Bert	University of Maastricht	Quantitive Economy
91	Mehdad, Ehsan MSc	Tilburg University	
92	Meuffels, MSc. W.J.M.	University of Tilburg	Department of Econometrics & OR, CentER Applied Research
93	Mnich, M.	Eindhoven University of Technology	Dept. of Mathematics & Computer Science
94	Naeemi, MSc. S.H.	Maastricht University	Department of Quantiative Economics
95	Nguyen Phan, B.S.	University of Groningen	Fac. of Economics & Business
96	Nielsen, L.K. MSc.	RSM Erasmus University	
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68	Norde, Prof.dr. H.W.	Tilburg University	Dept. of Econometrics & OR CentER
69	Nunen, Prof.dr.ir. J.A.E.E. van	RSM Erasmus University	Rotterdam School of Man.
70	Nunez Queija, Prof.dr. R.	Amsterdam University	Fac. of Economics & Business
71	Pendavingh, Dr. R.A.	Eindhoven University of Technology	Dept. Of Math. and CS
72	Peters, Prof.dr. H.J.M.	Maastricht University	School of Business and Economics
73	Resing, Dr. J.A.C.	Eindhoven University of Technology	Dept. of Mathematics & Computer Science
74	Ridder, Dr. A.A.N.	VU University Amsterdam	Fac. der Economische Wetenschappen & Bedrijfskunde
75	Roos, Prof. dr.ir. C.	Delft University of Technology	Fac. EWI
76	Röglin, Dr. H.	Maastricht University	School of Business and Economics
77	Scheinhardt, Dr.ir. W.R.W.	University of Twente	Faculty of EEMCS
78	Schrijver, Prof.dr. A.	CWI	
79	Schuur, Dr. P.C.	University of Twente	Fac. of Technology & Management
80	Schäfer, Prof. dr. G.	Centrum Wiskunde & Informatica	
81	Sierksma, Prof. dr. G.	University of Groningen	Faculty of Economics and Business
82	Smit, Prof.dr.ir. J.H.A. de		
83	Spieksma, Dr. F.M.	Leiden University	Mathematical Institute
84	Spieksma, Prof.dr. F.C.R.	KU Leuven	Faculty of Business and Economics
85	Still, Dr. G.J.	University of Twente	Faculty of EEMCS
86	Stougie, Dr. L.	VU University Amsterdam	Fac. der Econ. Wetenschappen & Bedrijfskunde
87	Talman, Prof.dr. A.J.J.	Tilburg University	CentER
88	Telgen, Prof.dr. J.	University of Twente	Dept. of Management and Governance
89	Teunter, Prof. dr. R.H.	University of Groningen	
90	Thuijsman, Dr. F.	Maastricht University	Dept. of Knowledge Engineering
91	Tijms, Prof.dr. H.C. emeritus	VU University Amsterdam	Fac. of Economics & Business Admin.
92	Tijs, Prof.dr. S.H. emeritus	Tilburg University	Dept. of Econometrics & OR CentER
93	Timmer, Prof.dr. G.T.	VU University Amsterdam	Fac. of Economics & Econometrics
94	Uetz, Prof.dr. M.	University of Twente	Faculty of EEMCS
95	Velde, Prof.dr. S.L . van de	RSM Erasmus University	Dept. of Technology & Innovation
96	Veldhorst, Dr. M.	Utrecht University	Dept. of Information & Computer Science
97	Vis, Dr. I.F.A.	VU University Amsterdam	Afdeling Informatiekunde en Logistiek
98	Vlerk, Prof.dr. M.H.van der	University of Groningen	Department of Operations
99	Volgenant, Dr. A.	University of Amsterdam	Fac. of Economics & Econometrics
100	Vorst, Prof.dr.ir. J.G.A.J. van der	Wageningen University	Operations Research & Logistic Group
101	Vredeveld, Dr. T.	Maastricht University	School of Business and Economics
102	Vrieze, Prof.dr.ir.drs. O.J.		
103	Wagelmans, Prof. dr. A.P.M.	Erasmus University Rotterdam	Erasmus School of Economics
104	Wal, Prof.dr.ir. J. van der	Amsterdam University	Fac. of Econometrics
105	Woeginger, Prof.dr. G.J.	Eindhoven University of Technology	Dept. of Mathematics and Computer Sciences
106	Zijm, Prof.dr. W.H.M.	University of Twente	School of Management & Governance
107	Zwart, Prof.dr. A.P.	CWI	PNA2 (Probability and Stochastic Networks)

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