DEPARTMENT OF LOGISTICS

UNIVERSITY OF STELLENBOSCH

POSTGRADUATE INFORMATION:

QUANTITATIVE MANAGEMENT

2021

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QUANTITATIVE MANAGEMENT POSTGRADUATE MODULES

Anchor programmes:

BComHons (Quantitative Management)
Programme module

Code	Module	Credits	Module Name
58351	778	120	BComHons (Quantitative Management)

MCom (Quantitative Management)
Programme modules

Code	Module	Credits	Module Name
58351	899	180	MCom (Quantitative Management) Coursework- and Thesis option

MCom (Quantitative Management)
Programme module

Code	Module	Credits	Module Name
58351	879	180	MCom (Quantitative Management) Full Thesis Option

MODULES FOR 2021

Module number	Module	Code	Lecturer	Credits
	First semester			
11	Introduction to Forecasting [LM]	10911 723	Mr H Freiboth	15
15	Quantitative Modelling [QM] [Compulsory]	12722 711	Dr CG Jacobs	15
17	Road Transport Management [TE]	59145 744	Mr JA van Rensburg / Mr M October	15
31	Supply Management (Inbound) [LM]	13077 714	Mr H Moses	15
32	Supply Management (Outbound) [LM]	13078 714	Prof L Goedhals-Gerber	15
37	Warehouse Operations Management) [LM]	13472 741	Prof JJ Louw	15
43	System Dynamics [OR]	40541 774	Dr L Venter	15
44	CAPITA SELECTA 2 : Agent-based modelling [OR]	12723 771	Dr L Potgieter	15
	Second semester			
9	Customer Service and Logistics Interface Management [LM]	11485 722	Ms A de Bod	15
25	Forecasting [OR]	10933 753	Prof JH Nel	15
26	Methods of Quantitative Management [QM] [Compulsory]	12721 741	Dr L Potgieter	15
Pass Prerequisite: Module 11 or OR 3 is a pass prerequisite for Module 25 Module 15 is a pass prerequisite for Module 26	Research Seminar, first and second semester: Quantitative Management BComHons 11047 772			30
	Quantitative Management MCom 150 12972 882 (The 150 credit QM MCom program requires coursework of 30 credits) 180 12972 828			

MODULE 15

12722 711 QUANTITATIVE MODELLING

Course objective

This module will equip students with advanced quantitative skills, which will allow them to identify, solve and interpret the selected mathematical models in the industry in general. The process consists of several steps: (i) identification of the problem, (ii) compilation of a mathematical model, and (iii) the solution and interpretation of the results.

Course content

- Linear algebra;
- Linear programming modelling with specific applications in product supply chain management and the industry in general;
- Scheduling models;
- Inventory modelling;
- Applications in LINGO.

Remarks

1. The module is presented during the first semester.
2. The module counts 15 credits.
3. Quantitative Management 3 is a pass prerequisite for this module.
4. The module is offered residentially only.
5. Passing this module is a pass prerequisite for Module 26 (Methods in quantitative management).

MODULE 18

10925 742 LOCATION OF FACILITY

Course objective

The facility location problem is complex and related decisions may have a long lasting influence on the achievements of a business. The Facility location and the allocation of customers to these facilities determine the distribution pattern and the associated characteristics, such as time, cost and efficiency. Optimal Facility location and assignment of clients ensures good flow of material and service to clients, as well achieving efficient use of scarce resources.

Course content

1. Basic location models
2. Network problems
3. Problems with/without capacity restrictions
4. Dynamic facility location problems
5. Assignment problems
6. Stochastic facility location problems
7. Placement of obnoxious facilities

Remarks

1. This module is presented during the second semester.
2. Operations Research 314 and 344 or 60% for Quantitative Management 3 are pass prerequisites for this module.
3. This module counts 15 credits.
4. This module is only available to residential students.

MODULE 26

12721 741 METHODS OF QUANTITATIVE MANAGEMENT

Course objective

This project-driven module is presented in cooperation with a number of associates in industry. The module is presented in the form of three project-driven cycles, in which field trips, mathematical modelling, and oral as well as visual presentations, play a central role.

Course content

The subjects covered in the projects are in the three main categories of:

1. Mathematical programming;
2. Inventory control;
3. Modelling of physical distribution or a scheduling problem.

Remarks

1. The module is presented during the second semester.
2. The module counts 15 credits.
3. Quantitative management 3 and the Module "Quantitative modelling" (12722 711) are pass prerequisites for this module.
4. The module is offered residentially only.

MODULE 43

40541 774 SYSTEM DYNAMICS

Course objective:
This module will introduce students to the simulation technique, System Dynamics (SD). System Dynamics is 'n technique with which we can analyse the nonlinear behaviour of complex systems by using stocks, flows, and internal feedback loops. Upon completion of this module, students will have the ability to identify apt applications for SD simulation, understand the underlying theory, build executable models in the appropriate software, and interpret models.

Course contents:
1. Introduction to System Dynamics
2. Model elements and techniques
3. Testing and verification
4. Analysis and calibration

Comments:
1. The module is presented during the first semester.
2. The module is for 15 credits
3. Quantitative Management 3 or Operations Research 3 is a prerequisite for this module.
4. The module is presented residentially only.

MODULE 44 CAPITA SELECTA

12723 771 AGENT-BASED MODELLING

Course objective:
This module will introduce students to agent-based modelling. Agent-based models are a class of computational models for simulating the micro-level actions and interactions of autonomous agents (individuals or collective entities) with a view to assessing their effects on the system as a whole, on the macro-level. After successfully completing the course, students will have the ability to identify appropriate applications for agent-based modelling, understand the underlying theory, be aware of different modelling concepts and design considerations, implement executable models in appropriate software, use a variety of verification and validation techniques, analyse and interpret results obtained.

Course content::
1. Introduction to agent-based modelling
2. Modelling concepts and design
3. Model building
4. Paramaterisation and calibration
5. Verification, validation and replication
6. Model analysis

Comments:
1. The module is presented during the first semester.
2. The module counts 15 credits
3. The module is presented both residentially (practicals) and online (theory – selfstudy).
4. Basic to intermediate computer programming skills are recommended. With basic skills, the learning curve may be somewhat steeper, but the course can still be successfully completed.