DEPARTMENT OF LOGISTICS

UNIVERSITY OF STELLENBOSCH

POSTGRADUATE DIPLOMA:

TRANSPORT AND LOGISTICS

2019

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POST GRADUATE DIPLOMA IN TRANSPORT AND LOGISTICS: MODULES

Anchor programme:

PGDip (Transport and Logistics)
Programme module

Code	Module	Credits	Module Name
13760	788	120	Transport and Logistics Studies

Student profiles (the programme content will vary dependent on the prior learning of the student):

A	Students with **NO** previous (undergraduate) qualifications or exposure to Logistics Management or Transport Economics
B	Students **WITH** previous (undergraduate) qualifications or exposure to Logistics management (on 3rd year) but **NO** Transport Economics under graduate exposure/ experience.
C	Students **WITH** previous (undergraduate) qualifications or exposure to **Transport Economics** (on 3rd year) but **NO** Logistics Management under graduate exposure/ experience.
D	Students **WITH** previous (undergraduate) qualifications or exposure to **Logistics and Transport economics** (on 3rd year).

All students must register for and pass a total of at least 8 modules (for a total of 120 credits). Depending on the undergraduate background, the number of compulsory and elective modules will differ. The tables below outline the compulsory modules per student profile listed above, as well as the elective modules that can be followed in both the Logistics Management and Transport Economics focus areas.

COMPULSORY MODULES FOR 2019					
Module number	**Module [profile compulsory for]**	**Code**	**Semester**	**Lecturer**	**Credits**
D1	Intro to Transport Economics [A] [B]	13474 711	1	Mr R Kgwedi	15
D2	Intro to Logistics Management [A] [C]	13475 711	1	Prof JH Havenga	15
D3	Analysis Tools and Techniques [A] [B] [C] [D]	13477 711	1	Prof JH Nel	15
D4	Supply Management [A] [B] [C] [D]	11480 771	1	Prof L Goedhals-Gerber	15
D5	Inventory Management [A] [B] [C] [D]	13480 741	2	(to be confirmed)	15
11	Introduction to forecasting [A] [B] [C] [D]	10911 723	1	Mr H Freiboth	15

NOTE: *D3 – Analysis Tools and Techniques* cannot be taken by students that had *Quantitative Management* as a major for their undergraduate degree.

ELECTIVE MODULES FOR 2019 – LOGISTICS MANAGEMENT FOCUS					
Module number	**Module**	**Code**	**Semester**	**Lecturer**	**Credits**
9	Customer Service and Logistics Interface Management	11485 722	1	Ms A de Bod	15
29	Supply Chain Performance Management & Technology Enablement	11483 722	2	Ms UI Kussing	15
44	Capita Selecta (Visual SC Data Analysis)	11571 771	2	Prof JJ Louw	15
A, B, C & D: Choose at least one of the above modules **NOTE:** Module 44 has only a limited number of seats are available. Students who wish to take this module must discuss their interest with the lecturer as early as possible (by latest Wednesday, 13 February 2019).					

ELECTIVE MODULES FOR 2019 – TRANSPORT ECONOMICS FOCUS					
Module number	**Module**	**Code**	**Semester**	**Lecturer**	**Credits**
8	Air Transport Economics	11275 742	2	Mr Corné de Waal / Mr J van Rensburg	15
17	Road Transport Management	59145 744	1	Mr RA Janse van Rensburg	15
34	Shipping Economics	12995 773	1	Mr G Dekkers / Mr R Kgwedi	15
41	International Trade Transport Infrastructure and Logistics	13076 744	2	Mr J van Rensburg	15
A & B: Choose at least one of Modules 17 & 41 (Modules 8 & 34 may NOT be taken) **C:** Choose at least one of the above modules **D:** Choose at least two of the above modules					

ADDITIONAL ELECTIVE MODULE FOR 2019					
Module number	**Module**	**Code**	**Semester**	**Lecturer**	**Credits**
25	Forecasting [Operations Research]	10933 753	2	Prof JH Nel	15
A, B, C & D: Module 25 can be chosen if a student passed the *Introduction to Forecasting* module in the first semester. This module has a very strong quantitative focus and is only recommended to students that had *Quantitative Management* as a major at undergraduate level.					

OVERVIEW

The Diploma in Transport and Logistics will provide graduate students with no prior Logistics or Transport Economics training with the core knowledge and skills about Transport Economics and Logistics. The qualification is thus aimed at people entering the business or professional environment that are suitably qualified in a specific field of knowledge, but lack the Transport and Logistics management background. It provides the opportunity to students to ensure a competitive advantage and to broaden career prospects. The qualification is also aimed at BCom Logistics and Transport Economics students that want to further their education.

MINIMUM ADMISSION REQUIREMENTS

The minimum admission requirement is a three-year Bachelor's degree in any field. Applicants in possession of a three-year Bachelor's degree must have at least 55% in their core subjects.

Students with no or limited experience in Logistics Management and Transport Economics, are required to enroll for the introductory modules (Introduction to Transport Economics and Introduction to Logistics Management). Students with Logistics or Transport Economics at third year level may not enroll for the introductory modules. They enroll for more elective modules.

DURATION

One year full-time from January to November.

VENUE

The programme is presented on the main campus of the University of Stellenbosch in Bosman Street, Stellenbosch.

COURSE FEES

The course fee amounts are available from the Student Fees department of Stellenbosch University. The contact number is 021 808 4913. Request a quotation: http://www.maties.com/what-will-it-cost.html

STUDY MATERIAL

Text books are used in the modules in the programme and details are made available at the beginning of each module.

NQF LEVEL AND CREDITS

This postgraduate diploma is presented at NQF level 8 (120 credits).

LECTURES

All modules will be presented in English.

MODULE LECTURERS

The lectures are primarily presented by lecturers of the Department of Logistics at the University of Stellenbosch. Occasionally, lectures are presented by guest speakers.

ASSESSMENT & EXAMINATION

Student progress is monitored by means of a continuous assessment scheme. Assessment schemes tend to be classical, focusing on individual performance, while allowing some credit for group work. Schemes may differ from module to module but will mainly fall in the following categories:

- Short class tests covering pre-reading on preparation;
- A final comprehensive test evaluation higher order learning outcomes, mainly integration by means of case studies or other applications;
- Individual or group assignments; and
- Case studies – written analysis or presentations.

APPLICATION

The application process is as follows:

- For current students of Stellenbosch University – apply electronically on www.mymaties.com (Administration A contact: Mr J Flandorp, jacquin@sun.ac.za, 021 808 4383)
- For new students – apply electronically on www.maties.com or send an email to info@sun.ac.za contact 021 808 9111 (Administration A contact: Mr J Flandorp, jacquin@sun.ac.za, 021 808 4383)

The closing date for applications is 31 October.

SELECTION

Only a limited number of students are accepted each year on the ground of their qualifications and/or performance in bachelor's degree.

The selection process will commence soon after the closing date for application whereafter students will be notified per e-mail whether they are accepted into the programme.

Applicants who are accepted into the programme will receive additional information per email. The information will include a list of important dates and a confirmation letter that has to be completed and returned to the Department of Logistics to verify participation in the programme.

GRADUATION

The Post-Graduate Diploma will be awarded to successful students during the December or March graduation ceremony. This post-graduate diploma will represent 120 credits on the NQF level 8.

CONTACT DETAILS

Further information can be obtained from:
Dr CG Jacobs
Room 3037, Van der Sterr building
021 808 2256
neil@sun.ac.za

PROGRAMME DESCRIPTION

From the largest manufacturers to the smallest producers, any company that purchases and/or sells products, has a need for logistics professionals to manage the flow of products and information locally, nationally and internationally. Service entities like hospitals and restaurant chains must also manage logistics activities. The emphasis in this programme is on strategic, tactical and operational management of the supply chain of a business, and secondly, on transport planning and investment in transport infrastructure in the public and private sectors.

PROGRAMME OUTCOMES

The Post graduate Diploma in Transport and Logistics equips graduates with the ability to:

- analyse the supply chain processes;
- analyse management and economic principles in air, maritime and overland transport;

- analyse facility management with regards to port operations, warehouse management and material handling; and to
- synthesize the complex and multifaceted issues in transport planning and appraise modal options available.

On accessing, processing and managing information and producing and communicating information, the Post graduate Diploma in Transport and Logistics equips graduates with the ability to:

- gather and synthesize relevant information from relevant sources for investigating specific logistic and transport problems;
- use appropriate tools to process and manage logistics and transport data and information; and to
- manage relevant data and information and effectively communicate such information in written documents.

On, ethics and professional practice, management of learning and accountability, the Post graduate Diploma in Transport and Logistics equips graduates with the ability to:

- work with public and private sector groups and understand the nature of interactions that can generate the collaborative and creative actions to deal with issues in transport and logistics, and
- to be responsible in managing the processes in the transport and logistics contexts.

FREQUENTLY ASKED QUESTIONS

Who qualifies for the Post Graduate Diploma in Transport and Logistics?

Anybody with an undergraduate degree that did NOT specialise in Logistics Management and/or Transport Economics can apply for the programme. BCom Logistics Management or Transport Economics graduates that do not qualify or are not accepted in the Honours programmes can apply for this programme. The programme is aimed at broadening your career possibilities. During the selection process undergraduate marks and all other qualifications and experience are taken into consideration. It is our aim to protect the quality of the interaction during lectures – therefore a selection process does apply and we do not simply allow all applicants to participate. Applicants are welcome to include in their applications any motivational letters or information that could increase their selection potential.

When is the closing date for applications?
The closing date for applications is 31 October.

But my final marks are not yet available on 31 October when the applications close?
Students are conditionally selected based on their available marks – when the programme commences in January of each year students have to provide proof of the completion of their degree. If the student only graduates in March/April graduation ceremony of Stellenbosch University, a letter of proof from administration is also acceptable.

When will I know whether I have been accepted for the Post-Graduate Diploma in Transport and Logistics?
Selection for the programme usually takes place during the first three weeks of November whereafter applicants are notified by e-mail whether their applications were successful. More information about the programme is also provided.

Is this a part time programme?
The Post-Graduate Diploma in Transport and Logistics is a FULL-TIME programme and participants are NOT allowed to have full-time jobs. Lectures will take place during the day.

DETAILED MODULES

MODULE D1

13474 711 Introduction to Transport Economics

Course objective

Transportation plays a critical role in the economic development of societies. In many instances, countries with well-developed transport industries and infrastructures have seen faster rates of economic development and have become highly competitive in the global market. Therefore, it is imperative that those involved in the operational, tactical and strategic sectors of the transport industry possess a thorough background of appropriate knowledge required to achieve the benefits associated with transportation. In this module a selection of topics relevant to the functions of transport, elements of transport demand, infrastructure provision, transport policy and regulation, modal cost structures and the economic evaluation of transport projects will be covered.

Course Content

Section 1:
Introduction
The functions of Transport
The components of transportation
The space/time relationship
The economic characteristics of transport

Section 2:
The elements of a transport system
Transport modes
Modal competition
Intermodal transportation

Section 3:
The factors influencing the demand for transport
The Urban Transport Modelling System (UTMS)
Transport demand analysis

Section 4:
Income distribution aspects
Elementary traffic flow theory
Transport economic project evaluation

Section 5:
Urban transportation
Transportation and land use / urban form
Urban land use models
Urban mobility
The urban transport problem and solutions

Remarks

1. The module is presented during the first semester.
2. The module carries 15 credits.
3. This module is compulsory for students with NO previous (3rd year) qualifications or exposure to Transport Economics.
4. This module cannot be taken by students that had Transport Economics as a major for their undergraduate degree.

MODULE D2

13475 711 Introduction to Logistics Management

Course objective

The student should be able to describe the basic functioning of a logistics channel. It is important to identify, illustrate and appreciate the contribution of all the major activities involved in logistics. The student should be able to articulate the major differences between the inbound and outbound logistics systems.

Course content

1. Introduction to Logistics & Supply Chain Management
2. Dimensions of Logistics
3. The Inbound Logistics System
4. The Outbound Logistics System
5. Major Activities involved in Logistics (Inventory Management, Transport, Storage, Packaging, Handling, Documentation, etc.)

Remarks

1. This module is presented during the first semester.
2. The module counts 15 credits.
3. This module is compulsory for students with NO previous (3rd year) qualifications or exposure to Logistics Management.
4. This module cannot be taken by students that had Logistics Management as a major for their undergraduate degree.

MODULE D3

13477 711 Analysis Tools and Techniques

Course objective

The increasing availability of data and computational power, combined with the general tendency of managers to base decisions on proper analysis of data, increases the demand for employees with analytical skills. This course aims to introduce students to analytical tools and techniques to be able to solve basic problems as well as recognise the opportunities for improvements in the operational environment, through the application of the learnt knowledge and skills or by related but more advanced techniques.

Course content

1. Business mathematics and Excel
2. Linear programming
3. Network modelling
4. Queueing Theory
5. Simulation

Remarks

1. This module is presented during the first semester.
2. The module counts 15 credits.
3. This module is compulsory for students with NO previous (3rd year) qualifications or exposure to Quantitative Management.
4. This module cannot be taken by students that had Quantitative Management as a major for their undergraduate degree.

MODULE D4

11480 771 Supply Management

Course objective

It is important for a business to analyse logistics processes and to focus on streamlining the processes. The business should consider practises to minimise logistics environmental impact and waste. Aspects such as warehousing, packaging and materials handling activities should be considered. Product delivery through transport service providers should be coordinated.

Course content

1. Global procurement and sourcing
2. Supplier management
3. In-house and outsourced production operations and supply chain execution
4. Warehousing
5. Materials handling
6. Packaging
7. Transportation (inbound and outbound)
8. Reverse logistics

Remarks

1. This module is presented during the first semester.
2. The module counts 15 credits.
3. This module is compulsory for all PGDip (Transport and Logistics) students.

MODULE D5

13480 741 INVENTORY MANAGEMENT

Course Objectives

It is important for any business to analyse the business requirements for inventory, and have effective inventory management systems. The business should select and implement applicable forecasting and demand planning techniques. An appropriate inventory management system should be employed and maintained. Inventory operations must comply with legislative and social responsibilities.

Course content

1. Business requirement for inventory
2. Inventory dynamics behaviour (effect of supply and demand dynamic)
3. Inventory positioning in a supply chain network
4. Performance and quality requirement
5. Audit inventory performance
6. Demand planning applied
7. Inventory management systems
8. Financing options
9. Inventory trade-off opportunities
10. Legislative and social responsibilities
11. Processes and procedures

Remarks

1. This module is presented during the second semester.
2. The module counts 15 credits.
3. This module is compulsory for all PGDip (Transport and Logistics) students.

MODULE 8

11275 742 AIR TRANSPORT ECONOMICS

Course objective

The air transport industry is complex and dynamic and subject to rapid change and innovation. With the introduction of deregulation it has become imperative to take cognisance of new business practices and management concepts. The module will, firstly, provide a basis for the student to enter the air transport industry at (junior) management level, and secondly to introduce students to managerial strategies used in competitive industries within and outside of air transport.

Course content

1. Economics and strategy in aviation, with reference to the role of aviation in the value chain.
2. Air traffic and the role of demand, market segmentation and demand forecasting.
3. Yield in aviation – the aspect of pricing, market segmentation and tariff structures that impact yield.
4. Output in aviation – determinants of output and restraints on utilization and capacity management options.
5. Unit costs in aviation – determining and management of cost.
6. Capacity management – decisions on design of networks, markets, routes, hub-and-spoke systems, alliances and the influence of scheduling on air transport cost.
7. Fleet management – aircraft acquisition and financing tactical utilization of aircraft capacity.
8. Revenue management – function of revenue management, actions taken and various approaches used.
9. Operating performance – relationship between unit costs, unit revenue, yield and load factors.

Remarks

1. This module is offered during the second semester.
2. This module counts 15 credits.
3. Transport Economics 318 and 348 are pass prerequisites for this module.

MODULE 9

11485 722 CUSTOMER SERVICE AND LOGISTICS INTERFACE MANAGEMENT

Course objective

The ultimate effect of logistics and supply chain activities / processes should meet the targeted customer requirements. Managing the interface between sales and logistics is of vital importance. Balancing the performance-related and cost-related targets remains a challenge.

Customer service is the source of customer information. It also provides the customer with real-time information on scheduling and product availability through interfaces with the company's production and distribution operations. Customer service is also a process for providing significant value-added benefits to the supply chain in a cost-effective way.

Course content

1. Introduction to Customer Service and Logistics Interface Management
2. Customer service dimensions and measurement
3. Customer Service's role in demand management
4. Customer Service strategy development
5. Customer service performance management
6. The customer service and customer relationship process across the value chain
7. Reverse marketing or Supplier Development

Remarks

1. The module is presented during the first semester.
2. The module counts 15 credits.

MODULE 11

10911 723 INTRODUCTION TO FORECASTING

Course objective

Planning and control of logistic activities require accurate numerical estimates of:

- Future product and service volumes which will be dealt with in the logistic chain, and
- Future conditions which might impact on logistic activities.

Time series data, in particular economic data, form an integral part of these estimates. There are, however, general problems in time series data, which must be addressed by the forecaster before making meaningful forecasts. The purpose of this module is to familiarise students with the identification of problems and the proper steps to be taken to avoid these problems. Students also develop competency in the use of computer software to be used for analysis and forecasting.

Course content:

1. Elementary statistics
2. Probability theory
3. Basic inferential statistics
4. The linear regression model and the method of least squares
5. Multicollinearity
6. Heteroscedasticity
7. Autocorrelation
8. Dummy and lag variables
9. Time series analyses
10. Applications in logistics

Remarks

1. The module is presented during the first semester.
2. The module carries 15 credits.
3. This module is compulsory for all PGDip (Transport and Logistics) students.
4. Students who have taken Operations Research 3 may not follow this module.

MODULE 17

59145 744 ROAD TRANSPORT MANAGEMENT

Course objective

The road transport industry is highly competitive. Therefore it is imperative to have a thorough understanding of the appropriate management aspects in transport operations. In this module a selection of topics relevant to strategic, tactical and operations management are covered which are essential for successfully running a road transport firm.

Course content

1. The role of road freight transport in the logistical chain
2. Detailed vehicle costing and control
3. Financial aspects of vehicle purchasing, management and replacement
4. Client service and marketing of the transport product
5. Analysis of current road transport legislation

Remarks

1. This module is offered during the first semester.
2. This module counts 15 credits.
3. This module is compulsory for all PGDip (Transport and Logistics) students.

MODULE 25

10933 853 FORECASTING

Course objective

In addition to the general problems in time series data considered in Module 11 (Introduction to forecasting), there are several more intricate problems related to time series data which require more intricate techniques for the identification and forecasting process. Students are familiarised with these techniques in order to identify and solve these problems.

Course content

The module comprises three sections:

1. Section I – Revision of …
   - Basic inferential statistics
   - The linear regression model and the method of least squares
   - Diverging from basic assumptions
   - Dummy and lag variables
   - Test and evaluation criteria
2. Section II – Advanced forecasting techniques:
   - Stationarity of time series
   - Moving average and exponential smoothing models
   - ARIMA models
   - Short and long term models
3. Section III – Applications of Forecasting:
   - Data gathering and related problems
   - Single and multivariate functions
   - Modelling
   - Presenting and interpreting modelling results

Remarks

1. The module is presented during the second semester.
2. The module counts 15 credits.
3. Module 11 (Introduction to forecasting) or Operations Research 3 is a pass prerequisite for this module.

MODULE 29

11483 722 SUPPLY CHAIN PERFORMANCE MANAGEMENT AND TECHNOLOGY ENABLEMENT

Course objective

The management of a supply chain's performance has become one of the key mechanisms to reaching excellence. Supply chain performance management can offer a structured way to identify and address performance issues of a supply chain. Performance management can enable more effective analyse and improvement of individual supply chain processes. It's aimed at providing operational information and insights across the supply chain by tracking key supply chain metrics (e.g. product quality, inventory levels and delivery performance). Proper performance management will also contribute to the drive for drive proper business management. (Integrate individual performance management with business management).

Supply chain performance management is based on the concept of measuring and managing performance at every level of the supply chain, using standards such as the Supply-Chain Operations Reference model (SCOR®), Six Sigma and Total Quality Management (TQM), and tools like dashboards and scorecards. The purposes for a performance measurement would include: decision support, monitor effect of strategic plans, performance evaluation, diagnosis, manage a continuous improvement process, motivation and comparison.

Sound information management required timely and accurate information available to enable supply chain business processes. This aims to ensure proper information accessibility and visibility to all parties involved thought the use of appropriate enabling technology. Enabling technology should be simplified, standardised and aim to eliminate duplication of information where possible.

The categories of business processes involved in supply chain management are planning-, execution- and control. Planning processes further break down into strategic-, tactical-, and operations processes. Planning processes predominantly require information for decision support (ensuring effective supply chains) while execution- and control processes require transactional information (ensuring efficient supply chains).

Course content

1. Key supply chain performance indicators that affect business performance;
2. Drive improvements through effective performance indicators;
3. Rewards, process changes, dashboards and scorecards;
4. Performance evaluation, diagnosis;
5. Supply chain planning and execution system management;
6. Selection, and implementation enabling technology.

Remarks

1. The module is presented during the second semester.
2. The module counts 15 credits.

MODULE 34

12995 773 SHIPPING ECONOMICS

Course Objectives

Almost 90 per cent of the volume of international trade is seaborne. The globalisation of economic activities has led to fierce competition, resulting in lower freight rates to which the shipping business has had to adapt. This module focuses on the demand for shipping, with specific reference to South African imports and exports, as well as on the supply of shipping and the changes in the behaviour of shipping markets.

Course content

1. The main features of the ship
2. Ship design, construction & operation
3. Types of ships around the globe (cargoes, trades and future trends)
4. Maritime canals, inland waterways & seaports
5. Liner conferences & charter parties
6. Containerisation
7. Ship financing, management & governance

Remarks

1. This module is presented during the first semester.
2. The module counts 15 credits.
3. Transport Economics 318 and 348 are pass prerequisites for this module.

MODULE 41

13076 744 INTERNATIONAL TRADE, TRANSPORT INFRASTRUCTURE AND LOGISTICS

Course objective

The growth of the South African economy is dependent on the current and future trade of resources with neighbouring and international countries. This entails the import and export of various commodities, including human capital, based on sound theoretical principles in political environments that are cost effective. This module focusses on various topics relevant to the export and import trade market and the optimal transport infrastructure to be used for these trade activities, including the correct logistical processes to be undertaken.

Course content

1. Introduction to International trade and trade theories
2. Trade in the Global Economy
3. Trade economics
4. International Ocean Transportation
5. International Air Transportation
6. International Land and multimodal Transportation
7. International Logistics Functions and Intermediaries
8. Terms of sale and payment
9. Documentation and insurance

Remarks

1. The module is presented in the second semester.
2. This module counts 15 credits.

MODULE 42

13470 711 RAIL ECONOMICS

Course Objective

The importance of effective and efficient Rail Transport to move people and goods within countries and across borders, are often underestimated. By providing this service, Rail Transport contributes to a country's economic growth and development, especially when it comes to transporting bulk freight and a large number of people. In this module, the focus is on analysing the relationship between Rail and economic growth and development, as well as the factors that influence that relationship, from a macroeconomic point of view. The aspects of legislation and regulation, as well as competition structures or market structures are comprehensively covered. The impact of Rail Transport on land use and urban development, as well as ownership structures and best-practice operating models are discussed and applied in a South African context.

Course Content

1. Railway economics and regulation
2. Railway market structures and competition
3. The factors influencing demand and demand forecasting
4. The factors influencing supply – the cost of supply, economies of scale, scope and utilization
5. Management structures and commercialization of railways
6. The South African rail industry, regulation, competition and ownership
7. Best-practice railway ownership structures and operations
8. Public-private partnerships in the railway industry
9. The relationship between rail and land use

Remarks

1. The module is presented in the second semester.
2. The module counts 15 credits.
3. Transport Economics 318 and 348 are pass prerequisite for this module.

MODULE 44

11571 771 CAPITA SELECTA (VISUAL SC DATA ANALYSIS)

Course Objective

Students following this module, can develop important analytical competences and be able to visually present and communicate supply chain (SC) related data more effectively. Students will be introduced to the structured process of "exploratory data analysis"; with a time-efficient progression from raw SC data to information to insight. This module covers inter alia the different ways to connect to a variety of types of data sources, doing exploratory data analysis and visualization, and answer the questions at hand. The foundation of data visualization techniques and - principles, effective data analysis techniques and visualization best practices, will be covered. Although an overview of current analytical tools will be done, this module will only focus in the correct use of one or two of the prominent data visualization software packages.

Course Content

1. Visualization theory, related concepts, terminology and different visualization types.
2. The structured "exploratory data analysis" process (e.g. data collection, pre-processing, definition, structuring, organizing, simplifying, cleaning, coding, hierarchies, formatting, testing, exploring).
3. Dealing with different data sources (doing joins and blends; working with relational data tables).

4. Proficiency with basic and slightly advanced quantitative and qualitative SC data analysis.
5. Computer-supported, interactive, visual representation of abstract data to amplify human cognition (sensitive to the human's pre-attentive visual processing).
6. Building simple to complex visualizations and how to combine them in interactive dashboards.
7. Establishing effective story boards and sharing visualizations.

Remarks

1. The module is presented in the second semester.
2. The module counts 15 credits.
3. Due to computer lab constraints, only a limited number of students can be accommodated. The class will be limited to 24 students; Students that want to follow this module are screened and selected primarily based on their academic performance (preliminary selection will take place during the period 28 Jan 2019 - 15 Feb 2019; a class list to be finalised by 22 Jul 2019).
