Syllabus
AQM5201 Business Analytics
Prof. Dr. Thomas Cleff
Summer Semester 2023

Level	Master	
Credits	3	
Student Contact Hours	2 (45 minutes)	
Workload	90 hours, 30 hours within class and 60 hours for the preparation of the paper and the presentation	
Prerequisites	Basic knowledge in descriptive and inferential statistics	
Time	Thursday 8.00am-9.30am / 9.45am-11.15am	
Room	W4.1.06	
Start Date	16th of March 2023	
Lecturer(s)	**Name**	Prof. Dr. Thomas Cleff
	Office	W2.4.21
	Virtual Office	Internet-Office
	Office Hours	Wednesday, 3.30pm-5.00pm
	Phone	+49 7231 28 6101
	Email	thomas.cleff@hs-pforzheim.de

Summary (optional)

The course is designed to enable students to perform independently comprehensive (marketing) re-search methods. Research design and key concepts are revisited and form the basis for coursework. Important guidelines for designing questionnaires and the procedures, techniques, and statistical considerations involved in sampling will be explained. Using examples from market research, various quantitative methods will be discussed. The course explains the use and significance of simple statistical methods and multivariable analysis most commonly taught in quantitative courses in business studies. It is organized to guide students through the logic of data analysis applying statistical measures, rather than calculating the statistics. Focusing on the software package SPSS the course is designed to show students how to analyze and interpret statistical data. Through methods of converting information into data coded for computers the lesson covers the basics of univariate, bivariate and multivariate statistics. The main goals are the use of appropriate methods, searching for patterns in a dataset and interpreting the output from statistical software. Communicating the research by preparing and presenting a formal report constitutes the last part of the course.

Outline of the Course

1. Preliminaries - Getting started with data analysis
2. Research design & measurement and scaling
3. Univariate descriptive statistics
4. Multivariate data analyses
   a) Working with SPSS
   b) Tests
   c) ANOVA, ANCOVA
   d) Regression analysis
   e) Cluster analysis
   f) Factor analysis
5. Sampling, sample size determination
6. Report preparation and presentation of the field research project

Course contributions to the MBA program goals / learning outcomes

Goal		Learning Objectives		Course Contributions to Goal	Assessment
1	**Responsible leadership in organizational contexts**	1.1	Knowledge of leadership principles	1.2 Students have to work in teams consisting of students from different countries and have to solve the problems connected with it.	• Presentation • Participation in class • Written Report
		1.2	Application of leadership principles		
		1.3	Critical reflection of leadership concepts		
2	**Creative problem solving skills in a complex business environment**	2.1	Ability to identify, differentiate and classify problems	2.1 to 2.4 Data analysis and data interpretation based on knowledge mediated methods	• Presentation • Participation in Class • Written Report
		2.2	Ability to analyze problems (instrumental competence)		
		2.3	Ability to find creative solutions (systemic competence)		
		2.4	Ability to present problems (communicative competence)		
3	**Research Skills**	3.1	Methodological knowledge (extending knowledge)	3.1/3.2/3.3 Data analysis and data interpretation based on knowledge mediated methods	• Homework Cases in Multivariate Analyses • Presentations of Multivariate Analyses • Written Report • Oral Exam
		3.2	Competence in applying relevant state of the art research methods (instrumental competence)		
		3.3	Ability to collect innovative results by using relevant research methods (systemic competence)		
4	**Management of Innovation**	4.1	Fundamental knowledge of operational innovation processes	4.2 Influence of Brand Equity on Consumer Satisfaction	• Written Report
		4.2	Ability to assess a company´s innovation potential		
		4.3	Ability to develop complex technological strategies		
5	**Management of the challenges of global sustainability and awareness for social and corporate responsibilities**	5.1	Fundamental knowledge of sustainability issues	5.1 to 5.3 Ethical issues in quantitative studies: objectivity, neutrality, the issue of data mining	• Participation in Class
		5.2	Ability to identify and analyze sustainability issues and its causes		
		5.3	Development of sustainability strategies		

Teaching and Learning Approach

The course includes computer exercises and presentations. The success of the seminar depends to a high degree on student cooperation. They present a part of the topics and are therefore responsible for a successful learning outcome. Students will be divided into groups/teams (4 students) and will remain in their groups for the entire course. Each group has to hold two presentations, has to conduct a field research study and has to write a short exposé of maximum 5 pages and a final report of maximum 20 pages.

Literature and Course Materials

1. **Course Materials (Required Texts):**
   - Cleff, T. (2019): Applied Statistics and Multivariate Data Analysis for Business and Economics. A Modern Approach Using SPSS, Stata, and Excel. Cham: Springer.
     → Available online through our library (use vpn from outside of the University!)
   - Bienecker, M., Cleff, T., Walter, N. (2022): Organic wine consumption in Germany – an Analysis of Consumer Purchase Intention for Organic wine based on the Theory of Planned Behavior, in: Erceg, A., Požega, Ž. (Eds.): Interdisciplinary Management Research XVIII, Opatija, 397-428.
     → Available online on the internet: Link
   - Janssens, W., Wijnen, K., Pelsmacker de, P., Kenvove van, P. (2008). *Marketing Research with SPSS*, Pearson Education: Essex. (ISBN: 978-0273703839)
   - Sarstedt, M., Mooi, E. (2019). *A concise guide to market research: The process, data, and methods using IBM SPSS Statistics*, 3rd Edition. Springer: Berlin and Heidelberg.
     → Available online through our library (use vpn from outside of the University!)
     → See corresponding webpage: http://www.guide-market-research.com/
2. **Course Materials (Optional Texts):**
   - White, L. (2005): Writes of Passage: Writing an Empirical Journal Article, in: Journal of Marriage and Family, Vol. 67, No. 4, pp791-798.
     → Available online through our library (use vpn from outside of the University!)
   - Nunan, D., Birks, D.F., and Malhotra, N.K. (2020): *Marketing Research - Applied Insight*, 6th Edition, Harlow, England, New York: Pearson. Only Chapter 14 & 15.
     → Available online through our library (use vpn from outside of the University!)
3. **Access to computer software:**
   Exchange and regular students at Pforzheim University have the possibility to use SPSS in labs or on your home computer home:

   - **Usage of SPSS in labs at university**
     You have the possibility to use SPSS software on the computers in the Marketing Lab (W2.1.14) and the Logistics Lab (W2.3.12 and W2.3.14). These computers have priority for license granting, so the operability in these labs is guaranteed.

   - **Usage of SPSS on the home computer**
     SPSS can be installed by students on their own computer. VPN-connection to Pforzheim University must exist in order to use the software. This software does not run without VPN-connection! For more details, please follow this link: https://businesspf.hs-pforzheim.de/en/studium/studierende/fachgebiete/quantitative_methoden/software.
     Password = Username = SPSS.

Assessment

The grading consists of the following parts:

Presentation of the method (incl. preparation of exercises):	30%
Solution of homework-cases and participation/presence:	10%
Exposé:	10%
Final report:	30%
Oral Exam about the final report (incl. quantitative methods):	20%

In addition, the following rules are applied:

- Each individual performance must be passed with the minimum grade 4.0.
- The professor reserves the right to grade the partial performances in the same group differently.
- The professor reserves the right to grade the course as „not passed "(5.0) in case of more than two absences.
- A late hand in of the written paper will be graded as „not passed" (5.0).

For the grading I use the following scale:

Very good (1.0) stands for an outstanding performance far above average. *Good* (2.0) stands for a performance that is above average. *Satisfactory* (3.0) is an average performance that shows weaknesses but still corresponds to the requirements. *Sufficient* (4.0) stands for a below average performance with evident weaknesses. *Poor* (5.0) stands for a non-acceptable performance that does not correspond to the requirements.

Schedule

Date	Time	Content	Responsible	Room
2023-03-16	08.00-09.30	Introduction; Getting started with Data Analysis; Data Entry and Data Editing	Cleff	W4.1.06
2023-03-16	09.45-11.15	Research Design & Measurement and Scaling	Cleff	W4.1.06
2023-03-23	08.00-09.30	Working with SPSS and Descriptive Statistics	Group 1	W4.1.06
2023-03-23	09.45-11.15	Univariate Statistics and Tests with SPSS	Group 2	W4.1.06
2023-03-30	08.00-09.30	Analysis of Variance (ANOVA) & Indepedent T-Test	Group 3	W4.1.06
2023-03-30	09.45-11.15	Linear Regression	Group 4	W4.1.06
2023-04-04	11.30-13.00	Cluster Analysis	Group 5	W4.1.06
2023-04-04	13.45-15.15	Exploratory Factor Analysis	Group 6	W4.1.06
2023-04-12		Hand-in Exposé (until 11.00am)	All groups	
2023-04-20	08.00-09.30	Individual research project discussion (Gr#1: 8.00; Gr#2: 8.30; Gr#3 9.00)	All groups	W2.4.21
2023-04-20	09.45-11.15	Individual research project discussion (Gr#4: 9.45; Gr#5 10.15; Gr#6: 10.45)	All groups	W2.4.21
2023-05-25	8.00-9.30	Data Analysis Open Lab (with Professor)	All groups	W4.1.06
2023-06-22	08.00-11.15	Open Lab and final Questions about the Research Paper (Hand in at 23 pm)	All groups	W4.1.06
2023-06-29	08.00-11.15	Oral Exam about the final paper (incl. Quantitative Methods)	Group 1-6	W2.4.21

The first kick-off is carried out by the instructor to show first steps in data analysis (including data entry, data editing, measurement and scaling). Students are then asked to work through the following SPSS online tutorials:

- https://www.youtube.com/watch?v=_zFBUfZEBWQ
- https://www.youtube.com/watch?v=bapuGcjwiLQ

The seminar consists then of three parts:

Part 1 Multivariate Methods: Each team gets a "(Market) Research Method" which they have to present in 45 minutes at a given date. During the presentation students have to introduce the multivariate statistic procedure and show the application in SPSS on the basis of examples. In the following the team has to prepare computer exercises that last 45 minutes. Participants shall be able to deepen the presented subject. The responsible team prepares data sets and questions and supports the students in case of questions. The team has to prepare "Homework-Cases" so that the students can work on the topic at home. For this the team has to prepare datasets and questions as well. The other groups have to hand in the solutions to the team within one week and in return the responsible team has to give feedback about the correctness of the solutions within

another week as well. Each team has to participate at the computer exercises and homework-cases of the other teams. For detailed information see point: "Further information".

Part 2 Field Research Preparation: The teams have to conduct a field-research project ("survey"). Before conducting the survey, each group has to hand-in a short exposé about the research project (max. 5 pages). For detailed information see point: "Further information". **Latest (!) Deadline for the exposé is 12th of April at 11am for all groups**. The exposés and the research projects will be discussed for each individual group with the professor the 20th of April (30 minutes each group).

Part 3 Field Research, Data Analysis, Research Report, and Oral Exam: Each group is required to submit the results of their field research in the form of a maximum of 20 pages research paper by June 22 at 11pm. For more detailed information, see point: "Further information". Individual oral exams will be held the following week on June 29.

Topics of the field research project:

Determinants of the Purchase Intention based on the Theory of Planned Behavior – An empirical research study on

1. Group 1: ... organic skin care
2. Group 2: … organic food
3. Group 3: … organic drinks
4. Group 4: … organic clothes
5. Group 5: … organic cleaning products
6. Group 6: … organic cosmetics

Please refer to the above mentioned paper of Bienecker, Cleff and Walter (2022)!

The following documents have to be handed in:

- ppt-presentations as printout and as digital file to the professor
- homework solutions of each group (professor in cc:)
- feedback of the homework cases to each group (professor in cc:)
- exposé at the given date.
- final report as print out (including digital version of the report and its related data) to the professor (see above)

Academic Integrity and Student Responsibility
- Read this syllabus carefully.
- In the course I expect interest for the topic, mutual respect and trust, fairness, punctuality, continuity, engagement and willingness to perform.
- A great part of the work has to be done in the study group ("Intra-group-work"). Please take into account the following aspects: Respect each other, take responsibility for your action, be fair, act with honesty, trust each other, and demonstrate civility.
- Work success depends as well on the cooperation between the individual groups ("Inter-group-work"). The groups should support each other in their work. Take into account the above mentioned aspects of cooperation.
- Please be fair to others. This implies that you are punctual for class, that you do not leave earlier and that other topics not relevant for the course are dealt with-in the break (e.g. telephone calls, whatsapp). Please always bring the relevant course material. Your mobile phone is off.
- The above mentioned deadlines have to be complied with.
- If you happen to come down sick and miss some part of the course, please send me an email before class. Attendance will be verified on attendance lists.

- It is self-evident and favored that content relevant questions can be asked in each class. This is useful for you to see the comprehension progress and for the professor to estimate the knowledge level of students, so that specific topics can be more emphasized or be taught in a different pace.

Teaching Philosophy

I would like to contribute to a successful learning progress and to an understanding for the applied meaning of learning contents. Comprehension questions should be asked directly in class. Comments that are useful for a better learning progress are welcome. My target is that you pass the course successfully, however the main part of work is on your side. In case you have problems whatsoever with the course do not hesitate to contact me.

Additional Information

1. **Information for the presentation "Multivariate Method" and computer exercises**
   - Duration of the presentation: 40-45 minutes
   - Duration of the following discussion: 5-10 minutes
   - Content of the presentation:
     Presentation of the idea of the method; presentation of the method; implementation in SPSS; examples
   - Duration of the computer exercises: 40-45 minutes
   - Content: students should be enabled to deepen the presented subject. For this purpose, data sets and questions have to be prepared by the responsible team.
   - Target group of the presentation: your fellow students
   - Please send handouts to your fellow students 24 hours before you will hold the presentation

2. **Information for the homework-cases**
   - Goal: students should be able to deepen the subject matter at home.
   - For this purpose, data sets and questions must be prepared by the responsible team.
   - Each group sends **one** solution to a person of the responsible team within a week.
   - Within the following week each group gets a feedback from the responsible team about the solution.

3. **Information for the exposé (max. 5 pages)**
   The exposé should include the following parts:

   1. Introduction
      a. information about the background situation leading to the general research question ("nice story");
      b. the statement of the general research question;
      c. clear outline/plan of the research study
   2. Literature Review
      Describe the theoretical background and set your study within a wide context of other papers / articles / sources and show the additional and new benefit of your study
   3. Research Objectives and Hypotheses
      Derive the Hypotheses of your study using the literature discussed in section 2 (section 2 and section 3 can be merged into one section).
   4. Data Collection and Sampling
      a. Questionnaire development and pretesting
      b. Who or what will be the subjects/objects?
      c. How the research will be conducted?
      d. Sampling Method you want to use

5. Plan how to analyse the data. The following type of table should be used:

Hypothesis	Variables	Method
HO: Price has no influence on demand	**Dependent:** Demand (Question X in the Questionnaire) **Independent:** Price (Question y in the Questionnaire)	Regression
…etc.	…etc.	…etc.

4. Information for the written report

Make yourself familiar again with the basics of academic research.[1] Experience has shown that the structure below often proves to be practical for empirical articels:

        Abstract
(1) Introduction
(2) Literature Review (theoretical background)
(3) Hypotheses (Literature Review and Hypotheses are often merged into one section)
(4) Data Collection and Sampling
(5) Results and discussion
(6) Conclusions and implications
(7) Limitations and future research

It is expected that you are able to use these basics correctly. Students are reminded to properly cite any and all sources quoted or relied upon in preparing all coursework submitted for grading. **Penalties for improper citation or plagiarism may include a loss of marks, failure in the course, or expulsion. The work is also checked with the help of a Plagiarism Finder for the use of ChatGPT.** Unless otherwise indicated by their instructor, when preparing all assignments students should follow APA format and include both in-text citations as well as a full reference list. A detailed guide with examples is available at https://apastyle.apa.org/instructional-aids/reference-examples.pdf or https://apastyle.apa.org/style-grammar-guidelines/references/examples and students are highly encouraged to seek the help of library staff with any questions.

There should be no more than 20 pages (character height minimum 12 Times New Roman and 1.5 linespacing) and you should summarize the topic question and the survey results. Special emphasis should be on the following points:

1. On the **front page** put your last name, first name, student ID and email address of all group members.
2. **Presentation of the research question.** Formulate hypotheses which you then verify.
3. **Answering the research question** and verifying the question on the basis of SPSS procedures. Make use of the presented (multivariate) methods for verifying the connections.
4. Show **problem awareness** by discussing the weak points of your approach.
5. Draw a conclusion in a final chapter of about 1-2 pages.
6. Add a **reference of literature** you used.
7. **Questionnaire** and **coding plan** should be included as appendices in the paper.
8. The **written presentation** should be handed in as **data file** and in **print version**. Acceptable data files are word documents (*.doc) or (*.rtf).
9. The data of the survey should be included in a digital form as SPSS data file (*.sav).
10. The presentation has to be handed in at the **agreed date**.

---

[1] There are many sources concerning this topic, however at this point only incomplete sources are listed: White, L. (2005): Writes of Passage: Writing an Empirical Journal Article, in: Journal of Marriage and Family, Vol. 67, No. 4, pp. 791-798; Malhotra, N. K (2010). *Marketing Research. An Applied Approach*, 6th Edition, Pearson Education: Upper Saddle River, NJ; Nair P.K.R., Nair V.D. (2014). Organization of a Research Paper: The IMRAD Format. In: *Scientific Writing and Communication in Agriculture and Natural Resources*. Springer, Cham, p. 14-25.