

Syllabus
GMT5705 Managerial Decision Modeling with MS Excel spreadsheets
Dr. Andrei Moroc, CFA
Summer Semester 2024

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|------------------------------|--|------------------------|
| Level | Master | |
| Credits | 2 | |
| Student Contact Hours | 30 | |
| Workload | 60hours | |
| Prerequisites | Attendance and active class participation is critical | |
| Time | Friday, March 22, 13:45 – 20:00 Saturday, March 23, 9:45 – 16:00 Friday, April 26, 13:45 – 20:00 Saturday, April 27, 9:45 – 16:00 | |
| Room | W4.1.06 | |
| Start Date | March 22, 2024 | |
| Lecturer | Name | Dr. Andrei Moroc, CFA |
| | Office | - |
| | Virtual Office | - |
| | Colloquium | - |
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Outline of the Course

The course consists of three main elements:

(1) **Lecture**: this will be shortest part of the course, mainly to briefly introduce:

- managerial decision models: optimization models, predictive models;
- Microsoft Excel;
- best practices in Excel spreadsheet modeling;
- sources for business data.

(2) **Workshop**: this will be longest part of the course.

The only way to develop modeling skills is by practicing and making mistakes. Modeling seems deceptively simple when watching somebody else doing it. Therefore, this course involves a hands-on, in-class learning experience, with each student doing on his own laptop what the lecturer is showing.

2.1. Introduction of the main formulas and tools than can be used when modeling business decisions with Excel spreadsheets. All these formulas will be applied by each student in class by using simple examples.

- a. introduction of important Excel formulas such as SUM, AVERAGE, SUMPRODUCT, SUBTOTAL, IF, VLOOKUP, HLOOKUP, MATCH, INDEX, CHOOSE, INDIRECT, OFFSET, SUMIF, AVERAGEIF, COUNTIF, ISNUMBER, IFERROR, EDATE, IRR, XIRR, NPV, XNPV, YIELD;
- b. introduction of important Excel tools: Solver, Goal Seek, Data Table, Scenario Manager, Formula Evaluator, Conditional Formatting, pivot tables, filters, charts, naming ranges and cells, protecting and hiding information and formulas, data validation with drop-down lists;
- c. very brief introduction of macros.

2.2. A number of models for common business problems will be explained and developed together, by using the presented Excel formulas and tools and applying the presented best practices. Depending on students' interest and available time, Excel models for the following business problems could be developed:

- Strategy: building a plant onshore (e.g. in Germany) or offshore (e.g. in China),
- Strategy: buying a company,
- Strategy/marketing: launching a new product,
- Marketing: splitting the advertising budget to maximize audience,
- Marketing: pricing in a two-channel market (web and retail),
- Sales: when and how much to reduce the price,
- Finance: budgeting for a company,

- Investments: purchasing or leasing/renting(e.g. an equipment),
- Investments: investing in a certain asset (Discounted Cash Flow model),
- Production: minimizing costs given required output,
- Production: how much of each product to manufacture,
- Supply chain: route optimization / minimizing transportation costs,
- HR: planning work hours,
- Entrepreneurship: planning a start-up.

Models for other business problems desired by the students can be developed as well.

(3) **Assignment presentation and feedback session**

- The assignment will be chosen by students based on their background, interest and career goals.
- The assignment will be to prepare and present a business problem model and suggested solution. The assignment will be made of:
 - a) model in Excel, and
 - b) presentation: business problem description, challenges, goals, model explanation, model results, suggested solution.
- Initial presentation of the assignment in front of the class. After each presentation there will be an open discussion. Students are also expected to ask questions and give feedback on the presentation. These discussions, the feedback from students and the improvement suggestions from the lecturer are a critical part of the learning process for all attendees, not only for those presenting.
- Delivery of the final assignment per email. The assignment should be improved based on previous feedback.

Course Intended Learning Outcomes and their Contribution to Program Intended Learning Outcomes / Program Goals

By the end of the course, the participants shall be able to...

- ... analyze management situations using the same tools and concepts that are used by professional organizations
- ... develop a conceptual structure of a management decision/planning problem from the real business world
- ... choose and develop an appropriate model for a given situation
- ... build models in Excel spreadsheets to support management in decision making
- ... find and use appropriate data for each case

- ... compare between projects and make better resource allocation decisions
- ... think critically and analytically about different business problems and management decisions in different areas such as strategy, marketing, sales, investments, finance, supply chain or any other aspect of life
- ... design visual outputs (as printout or Powerpoint slide) to better communicate the generated results and insights to executives with limited time and plenty of decisions to make
- ... convince management by using strong quantitative arguments derived from the models.

Course Intended Learning Outcomes and their Contribution to Program Intended Learning Outcomes / Program Goals

| Program Intended Learning Outcomes | | Course Intended Learning Outcomes | Assessment Methods | | |
|---|--|--|--------------------|--------------|------------------------|
| After completion of the program the students will be able... | | After completion of the course the students will be able... | Presentation | Project Work | Participation in Class |
| | | | 20% | 50% | 30% |
| | | | Individual | Individual | Individual |
| 1 Responsible Leadership in Organizational Contexts | | | | | |
| 2 Creative Problem Solving Skills in a Complex Business Environment | | | | | |
| 2.1 | ...to identify & classify problems. | To identify, classify and have critical discussions about various management problems. | X | X | X |
| 2.2 | ... to analyze problems. | To perform analysis of various management problems using the same tools and concepts that are used by professional organizations. To build models in Excel spreadsheets to support management in decision making. To think critically and analytically about different business problems and management decisions in different areas such as strategy, marketing, sales, investments, finance, supply chain or any other aspect of business or life. | X | X | X |
| 2.3 | ... to creatively solve problems. | To develop creative solutions and alternatives to complex business problems from the real business world. | X | X | X |
| 2.4 | ... to explain problems and their solutions in a comprehensive manner. | To present their solutions to convince management by using strong quantitative arguments derived from the models. | X | X | |
| 3 Applied research skills | | | | | |
| 3.1 | ... to know the research and analysis methods important in his/her field of study. | To have an overview of the research and analysis methods used in the business world, as well as how and where to find information needed to support management decisions. | X | X | X |
| 3.2 | ... to appropriately apply the research and analysis methods. | To choose, develop and apply an appropriate model for a given situation. To find and use appropriate data for each case. To compare between projects and make better resource allocation decisions. | X | X | |
| 3.3 | ... to obtain innovative results using relevant research methods. | To obtain innovative results using relevant research methods and to design visual outputs (as printouts or Powerpoint slides) to better communicate the generated results and insights to executives with limited time and plenty of decisions to make. | X | X | |
| 4 Innovation management and management of digital transformation | | | | | |

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|----------|--|--|---|---|
| 5 | Management of the challenges of global sustainability and awareness for social and corporate responsibilities | | | |
| 5.1 | ...to have a sound basic knowledge of sustainability issues. | | | |
| 5.2 | ... to identify and analyze sustainability issues and their causes. | To highlight CSR issues in management decision making | X | X |
| 5.3 | ... to develop sustainability strategies. | To incorporate sustainability strategies in management decisions | X | X |

Literature and Course Materials

- 1) Lecture notes
- 2) Recommended literature:
 - a) Powell, S. and Baker, K. (2013), Management Science: The Art of Modeling with Spreadsheets (4th edition), John Wiley & Sons, ISBN: 978-1118582695
 - b) Balakrishnan, N., Render, B. and Stair, R. (2013), Managerial Decision Modeling with Spreadsheets (3rd Edition), Pearson, ISBN:978-0136115830
 - c) Winston, W. (2016), Microsoft Excel Data Analysis and Business Modeling (5th edition), Microsoft Press, ISBN: 978-1509304219
 - d) Winston, W. and Albright, C. (2015), Practical Management Science (5th edition), South Western Cengage Learning, ISBN: 978-1305250901
 - e) Benninga, S. (2014), Financial Modeling (4th edition), MIT Press, ISBN: 978-0262027281.

Assessment

Grading will be primarily done on the basis of the assignment. The grade will be based upon:

- (1) the quality of the assignment (70%):
 - a) Excel model (50%),
 - b) Powerpoint presentation of the model and results (20%),
- (2) the quality of delivering the presentation and of the Q&A session after the presentation (30%).

Additional Information – Laptop Requirement

Students need to bring a laptop to each class, unless otherwise instructed. Microsoft Excel, ideally in English or German, should be installed and function on this laptop. All students without a functioning laptop or without Microsoft Excel in English or German should inform the lecturer at least 3 days in advance of each class.