École Polytechnique Fédérale de Lausanne
College of Management of Technology

SYLLABUS
(Version: 30/11/22)

MGT 528 – Operations: Economics & Strategy
Wed 9h15-12h, Autumn 2022
BC01

Instructor
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Course Website

http://econspace.net/MGT-528.html [*login*: 528student; *password*: TBA in class]

Summary. Supply-chain management within a firm is concerned with the flow of goods and services from firms to consumers. The design of high-performance supply chains depends decisively on the information available to the different parties. The available information technologies, together with the incentives for the sharing of information within and across firm boundaries, are of key importance for the analysis and optimization of supply chains. This course provides an overview of the economic drivers and technological possibilities for designing a successful supply-chain strategy, especially in view of information flows.

Required Text. There is no required textbook for this course. Current required and background readings will be posted on the course website. A list of standard references is provided at the end of this syllabus. The ones particularly relevant for this edition of the course are printed in **bold**.

Assessment. Students need to complete a number of homework assignments (problem sets). There will also be a final exam as well as a team project.

The final examination covers the whole of the course. The course grade is computed as follows:

Grade = 0.2 (Problem Sets) + 0.4 (Exam) + 0.4 (Project).

For all *problem sets* I strongly encourage cooperation. Since some of the analysis can be demanding in terms of the new intuition required, discussing the problems with others is very important. Solutions need to be written up and handed in individually.

Course Website. Go to http://econspace.net/MGT-528.html and log in using the username and password provided in class.

For all *problem sets* I strongly encourage cooperation. Since the questions are designed to be both interesting and challenging, discussing them with others is essential for mastering the concepts. Note that solutions need to be written up and handed in individually (see also the sections on *Homework* and *Honor Code* below).

- **Problem Sets.** Homework will be assigned about every other week in the form of a problem set. Homework is due at the beginning of class by email to the TAs (not the professor) on its due date. **No late homework will be accepted and there is no makeup homework!** Graded homework assignments will be returned in class and thereafter may be picked up from the course assistant.

- **Exam.** There will be a *final exam given in January 2023 (on a date that is TBA)*. This exam is closed-book, but you are allowed to bring two sheets with your notes (A4, double-sided). You are expected to take the final exam on the date given. **There is no makeup exam!** If you have a justified scheduling conflict, please make an arrangement with the teaching staff before Wednesday, November 30. Any requests thereafter (other than documented emergencies) may or may not be granted.

- **Project.** The project is an integral part of the course and complements the course material. It should be carried out in teams of two or three students. Each team should submit a report of *at most 15 pages (excluding appendices)*. Specifically, the project should analyze how supply-chain management can be improved by methods touched upon in the course. The analysis can be either backward- or forward-looking. In either case, the team should describe the status quo and attempt to quantify the benefits and costs of the proposed innovation(s) (e.g., on a per-product basis); the precise numbers are not as important as a clear justification of the result. In addition, the team should analyze how sustainable any competitive advantage derived from the proposed supply-chain innovation is likely to be. There will be a team presentation at the end of the course.

++**SPECIAL**++ The best team project will be awarded the **Deloitte OES Prize** on December 14, 2022, based on the project presentation and the submitted report. A senior member of Deloitte will be helping in the evaluation of the reports and presentations. The Deloitte OES Prize has been awarded since 2013 for the best course project.

The **evaluation criteria** for the Deloitte OES Prize have three dimensions:

1. **The Business Concept**
   - Relevance and clarity of identified needs
   - Expert use of a quantitative model with estimated parameters
   - Relevance of concept / innovation to address the identified needs

2. **The Business Case**
   - Clarity of expected benefits; sustainability of competitive advantage
   - Evaluation of the implementation costs
   - Risk and change-management considerations

3. **Quality/Professionalism**
   - Quality of the report
   - Quality of the presentation
   - Relevance to course

In addition, it is **important** (for the Deloitte OES Prize in particular) that it becomes clear that *all* team members contributed to the project and its presentation.

- **Class Participation.** Your presence and participation in class are essential for gaining mastery of the material. At first sight it might seem to you that the concepts in this course are easy and might be quickly "crammed" before an exam. Experience shows that this first impression is more often than not incorrect, and in this course we therefore ask for your attendance and participation.

Re-grading Policy. Questions and concerns regarding grading must be submitted in writing along with the entire assignment to the teaching assistant. Any resubmission of the assignment will result in the *entire* assignment being re-graded. This means that your score after re-grading can be above or below your original score. *Re-grading requests are accepted only within one week of the date of return of the graded item in question.*

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Honor Code.[1] The Honor Code is the EPFL's statement on academic integrity. It articulates the school's expectations of students and faculty in establishing and maintaining the highest standards in academic work:[2]

"EPFL has the mission of generating, sharing and utilizing knowledge. It encourages the development of a critical mind and the spirit of innovation within a climate of collaboration, respect and mutual confidence amongst all its members. It respects an ethical charter which, based on concerns shared by all cultures, is in keeping with the international character of EPFL.

In my capacity as a student of EPFL, I actively undertake to:

- *Adhere to the principles of the EPFL ethical charter;*

[1] For more information, see here (under 2.3.1, in French)
[2] http://polylex.epfl.ch/files/content/sites/polylex/files/recueil_pdf/ENG/2.3.1_ch_code_honor_en.pdf

- *Acknowledge and respect the regulations governing school life;*
- *Respect the EPFL community as a whole and the work accomplished, in particular by favouring constructive dialogue amongst members;*
- *Strive for quality and integrity in my own work, refusing any cheating or plagiarism;*
- *Contribute to the efficiency of teaching and knowledge acquisition by way of a positive attitude;*
- *Respect the institution's infrastructure and its environment;*
- *Use resources provided by EPFL, particularly IT facilities, in an appropriate manner.*

Through my actions and commitment to this Honor Code, I contribute to the impact and reputation of EPFL and thus to respect and value associated with its diplomas."

Specifically, adhering to the EPFL Honor Code implies that all work in exams and quizzes must be done individually. For homework, students may consult with the teaching assistant and with other students, but must write up solutions independently based on their own understanding. All references and sources (e.g., in the team project) must be clearly identified and properly referenced. Lastly, *if you work with other students on a problem set, you must acknowledge their names on the front page of your submission.*

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Topics. Following is the schedule of topics for this semester.

Tentative Schedule

Session 1 (September 21): Origin and Scope of Logistics & Operations

Session 2 (September 28): Supply-Chain Coordination I

Session 3 (October 5): Supply-Chain Coordination II

Due: Problem Set 1

Session 4 (October 12): Strategic/Tactical/Operational Decisions

Due: Team-Project Ideas (1 page per idea; target: 1 idea per team member)

Session 5 (October 19): Performance Metrics & Pricing

Session 6 (October 26): Performance Metrics (Cont'd)

Session 7 (November 2): Inventory Management

Session 8 (November 9): No Class

Session 9 (November 16): Dealing with Risk

Due: Problem Set 2; Team-Project Proposal (3 pages; submit electronically)

Session 10 (November 23): Operational Efficiency (Queuing and Capacity)

Session 11 (November 30): Cooperation and Relational Contracts

Session 12 (December 7): Sourcing Decisions and Contracting

Session 13 (December 14): Team Project Presentations

1. **Report** due on **Friday, Dec. 9 (by 17h00)**, at OES mailbox at the ODY entry or at ODY 3.01.
2. **Poster** due on **Tuesday, Dec. 13, electronically** (***optional*** if you do not want to be considered for the OES Prize; irrelevant for grade).
3. **Slides** due: (a) **electronically** (in .ppt or .pptx) on **Dec. 13 (by 23h59)** to Prof. Weber; (b) [only if physical event has been scheduled] **3 hard-copies** (for judges) on **Dec. 14, in class**.

Session 14 (December 21): Review for the Upcoming Final Exam // LAST CLASS

Due: Problem Set 3

The winner of the 10th Deloitte OES Prize will be announced in class on December 14. There will be a prize for each member of the winning team.

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Background Reading. Although we posted course readings as our main reference, I recommend a couple of other useful books and articles for occasional background reading if you would like to flesh out the material using complementary texts. *These sources are completely optional. You might want to refer to this list after the course has finished, as you become interested in studying specific aspects of supply-chain analysis and information systems in greater detail.* The books particularly relevant for this edition of the course are printed in **bold**.

CACHON, G., TERWIESCH, C. (2009) *Matching Supply with Demand: An Introduction to Operations Management (2nd Edition)*, McGraw-Hill/Irwin, New York, NY.

GRAVES, S.G., RINNOY KAN, A.H.G, ZIPKIN, P.H. (EDS.) (1993). *Logistics of Production and Inventory*, Handbooks in Operations Research and Management Science, Vol. 4, Elsevier, Amsterdam, NL.

GRAVES, S.G., DE KOK, A.G. (EDS.) (2003). *Supply Chain Management: Design, Coordination and Operation*, Handbooks in Operations Research and Management Science, Vol. 11, Elsevier, Amsterdam, NL.

HOPP, W.J., SPEARMAN, M.L. (2011) *Factory Physics (3rd Edition)*, Waveland, Long Grove, IL.

LAI, R. (2013) *Operations Forensics*, MIT Press, Cambridge, MA.

MEINDL, P., CHOPRA, S. (2009) *Supply Chain Management (4th Edition)*, Prentice-Hall, Englewood-Cliffs, NJ.

MULANI, N. (ED.) (2003) *Achieving Supply Chain Excellence through Technology*, Montgomery Research, San Francisco, CA.

SIMCHI-LEVI, D. (2010) *Operations Rules: Delivering Customer Value through Flexible Operations*, MIT Press, Cambridge, MA.

SIMCHI-LEVI, D., KAMINSKY, P., SIMCHI-LEVI, E. (2002) *Designing and Managing the Supply Chain (2nd Edition)*, McGraw-Hill/Irwin, New York, NY.

SNYDER, L.V., CHEN Z.-J.M. (2019) *Fundamentals of Supply Chain Theory (2nd Edition)*, Wiley, New York, NY.

Some other relevant WWW resources:

- CIO (http://www.cio.com/category/supply-chain-management/)
- CIO Insight (http://www.cioinsight.com)
- Council of Supply Chain Management Professionals (http://cscmp.org)
- EBN (http://www.ebnonline.com)
- Manufacturing.net (http://www.manufacturing.net)
- SupplyChainBrain (http://www.supplychainbrain.com)
- Wikipedia (http://en.wikipedia.org/wiki/Supply_chain + links from there)

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