

**Business Process Engineering**  
Master Degree in Management Science and Engineering  
Second Semester, Academic Year 2018/2019  
Department of Sciences and Methods for Engineering  
University of Modena and Reggio Emilia

<b>Lectures</b>	Monday	10-13	room F 1.6 Buccola
	Tuesday	14-17	room F 1.6 Buccola
	Thursday	9-13	room F 1.6 Buccola

**Professors**

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**Office hours:** At the end of each lesson or by appointment (**to be taken via email**)  
Matteo Vignoli – Thursday 9-10 (only when the class is scheduled)

## **COURSE DESCRIPTION**

With Business Process Engineering we refer to the application of social science, design science, and engineering science research and practice to the study and implementation of new organizational designs, including the integrated structuring, modelling, development, and deployment of technologies and operational processes. Business process engineering aims at pursuing organizational effectiveness through designed organizational changes by creating and developing a plan for an artifact (product, structure, system, or component) with a specific intent. To enable these changes we intervene on organizational processes by using a design thinking approach.

Three are the main questions we need to pose ourselves when dealing with business process engineering projects. First, who are the people in charge of business process engineering projects and how should they work productively together? Second, how do they get an understanding of an organization when they are asked to re-design its processes? Third, what are the tools they can use for organizational design?

This course is aimed at addressing these issues and at building the competences necessary to design and manage business process engineering projects in complex contexts (e.g., characterized by geographic distribution, cultural differences, work ambiguity). The course will thus focus on three key distinct, but intertwined, issues:

1. Design and management of complex teams;
2. Data collection and analysis methods for a deep understanding of organizations;
3. Tools for organizational design.

## **COURSE OBJECTIVES**

The course aims at building students' knowledge on:

- the main characteristics and the tools to design and manage complex teams and the main tools of project management;
- the theoretical background and applied tools of process oriented organizational analysis and design;
- the main process modeling and simulation tools and techniques.

## **OVERVIEW OF COURSE CONTENT**

### **1. Design and management of complex teams**

Leadership and social processes in teams

Complex teams' design

Management of teams dynamics

Project Management

### **2. Data collection and analysis methods for a deep understanding of organizations**

Observation

Interview

Qualitative data analysis techniques

Survey

Experiments

### 3. Tools for organizational design

#### Business Process Engineering

- Research
- Analysis
- Synthesis
- Realization

#### Meaning and nature of business processes

- Functional structure and integration processes
- Process structure and business analysis
- Understanding and leading performance

#### Business Process Modelling, Simulation and Design

- Three perspectives on business processes (operational, strategic, change)
- Business Process Modelling (BPMN, SD, Agent)
- Business Process Simulation (DES, SD, ABS)
- Business Process Design (Business Design Thinking)

#### Change Design and Management

## MATERIALS AND READINGS

### Dolly

On the UniMoRe teaching web portal DOLLY, at <http://dolly.ingre.unimore.it/2018/> on the webpage dedicated to this course students will find:

- *A collection of required articles and book chapters.* The articles are scientific papers published in top organizational and engineering journals. We understand that reading scientific research from the original sources (instead of finding a summary in a text book or a slide) is challenging, but we strongly believe that it represents an important learning experience. On a related note, there is not a one-to-one mapping between the required readings and class lectures. This mismatch is intentionally designed!
- *Suggested readings.* Additional readings are provided to those of you who would like to understand more of specific topics or to those of you who did not follow an Organizational Behavior and Organizational Theory course before. The related topics will not be assessed in the final evaluation.
- *Lectures' slides;*
- *Cases and exercises for class discussion* (after class discussion);
- *Software* for process mapping and simulation.

### List of required articles and book chapters available on Dolly

1. Neeley, T. (2015). Global Teams that work, Harvard Business Review, 93 (10), 74-81
2. Kayworth and Leidner (2002) Leadership effectiveness in global virtual teams, Journal of Management Information Systems, 18 (3), 7-40
3. Flower F. J. (2009) Designing Questions to be good measures. In F. J. Flower Survey Research Design, Thousand Oakes (CA): Sage Publications, pp. 87-113.
4. Madsbjerg, C., Rasmussen, M. B. (2014) An Anthropologist Walks into a Bar, Harvard Business Review
5. Dorst, K., (2011) The Core of Design Thinking and its application, Design Studies 32, 521-532

6. Elsbach, Kimberly D., and Ileana Stigliani. "Design thinking and organizational culture: A review and framework for future research." *Journal of Management* 44.6 (2018): 2274-2306.
7. Liedtka, Jeanne. "Perspective: Linking design thinking with innovation outcomes through cognitive bias reduction." *Journal of Product Innovation Management* 32.6 (2015): 925-938.
8. Dong, Andy, Dan Lovallo, and Ronny Mounarath. "The effect of abductive reasoning on concept selection decisions." *Design studies* 37 (2015): 37-58.
9. Anylogic in Three Days

### Required textbooks

- Vijay Kumar (2012) 101 Design Methods: A Structured Approach for Driving Innovation in Your Organization, John Wiley & Sons Inc

### Suggested books

- Brown T. (2009) Change by Design: How Design Thinking Can Transform Organizations and Inspire Innovation, Harperbusiness
- Pidd M. (2009) Tools for Thinking: Modelling in Management Science, John Wiley & Sons Inc 3<sup>rd</sup> ed.
- Liedtka, J. Ogilvie, T. (2011) Designing for growth: A design thinking tool kit for managers, Columbia University Press
- The Design of Business: Why Design Thinking is the Next Competitive Advantage by Roger L. Martin

## TEACHING AND LEARNING PLAN FOR CLASS ATTENDANT STUDENTS

Class hours will be filled with theory lectures, invited talks delivered by professionals from different fields and companies, case discussions, simulations, and laboratory sessions. Students are strongly encouraged to participate in all class sessions and activities.

**Class attendance is expected and will be taken at every class.** Additionally, it is important that you arrive on time, ready to learn and participate. Please note: for those who are not interested in attending classes or cannot do that for some reason (e.g. illness, they are on Erasmus), please read the section 'EXAM EVALUATION FOR NON ATTENDANTS'.

Two are the main activities that attendants will be asked to perform during the course: a project work in a team and an individual take home exam.

### a. Team project

Attendants will be divided into projects teams to conduct a **project work**. Working on a joint project is the best way to learn about how to build and manage a great team and how to conduct, in practice, a business process engineering project. Former students relate that working with their team in this class taught them a lot about themselves and others. However, some teams are more challenging than others. While this is good because you will learn more, it also can create frustration.

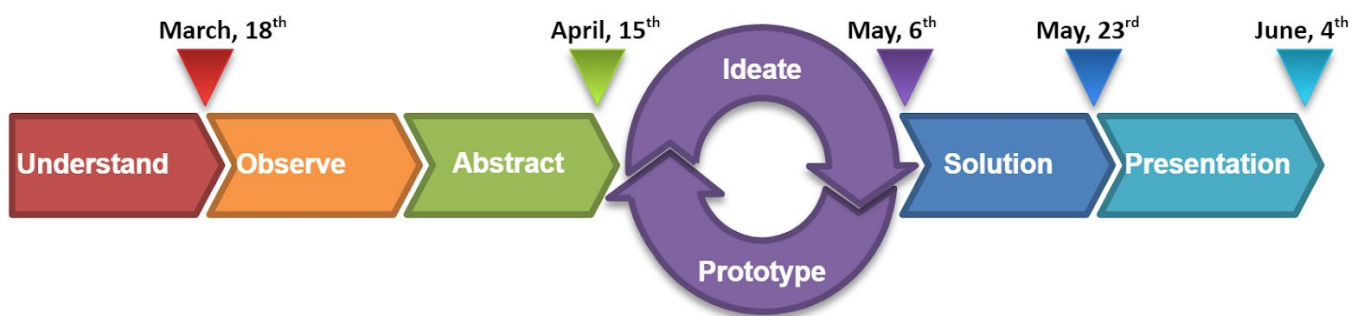
**Professors will form the project teams. Students are gently asked to fill in the form available at <https://goo.gl/forms/2UHHZqqN5NfsURas2>** in order to provide us with the information necessary to distribute members' characteristics, such as background, specific experiences, and gender, evenly across teams.

Details on group activities follow.

Each team will be in charge of conducting a business process engineering project. Specifically, it will be assigned to an organization facing a specific challenge and will apply the concepts and techniques learned during the course in order to drive a change process within the organization.

Each team will be assigned a **mentor**, i.e. a professional with experience in organizational processes and/or information systems, with whom team members can talk for up to 3 hours, during the entire duration of the project. The mentor can access the documents produced by the team, but does not provide any formal evaluation of the team

Each team will produce **5 deliverables** according to the following schedule. On March 11th organizations will present their challenges and will be matched with student teams. Between March 11th and June 4th, the deliverables will be sent by email to professors and presented in class. Details on each deliverable will be provided in class and posted on Dolly. A synthetic scheme follows.



Important: Only 2 of the deliverables will be formally evaluated by professors: Challenge Analysis (due on April 15th) and final presentation (due on June 4th). All the deliverables are due at 9.00 am, before the class starts.

The development process will be documented through informal discussion on the Facebook group of the class <https://www.facebook.com/groups/bpe19/> and in a blog that will be made available to each team <https://businessprocessengineering2019.wordpress.com/>

## b. Take home paper

In addition to team project work, individual attendants will be asked to deliver a **take home paper discussing the individual experience on the project**. Each student will prepare a discussion, based on both practical and theoretical knowledge acquired during the course. The case discussion will be written in a Word file (3 pages max) and uploaded on drive folder by June 10th. More details are available on Dolly.

The two activities just described (team project and take home paper) are mainly conducted out of class hours. Given that each course credit implies 9 hours of class activities and 16 hours of out of class independent work, we designed the course workload so that the out of class activities would cover a total of 192 hours. We encourage attendant students to keep track of their time in a journal and to review the log both individually and within their teams and to discuss it with the professors in order to allocate the correct effort to the different activities.

## CLASSROOM DEPARTMENT

Since our goal is to become more effective speakers and writers of English we will use only English in class. We will assume that each of us is coming to this class with different backgrounds and that the common goals of the class are best achieved when we work together as a group and each give our best efforts both inside and outside of class.

We recognize that this is a safe place for different ideas, beliefs, and values. Students should feel free to express their opinions. We will be willing to experiment and take risks through our discussions and our writing. Students are expected to always show respect for the opinions and ideas of others.

## SCIENTIFIC AND PROFESSIONAL ETHICS

Individual work contributions in this course must be your own. In addition, the project team deliverables must be done by ALL the members of the team and ONLY by the actual members of that team. The take home paper, on the other hand, is an individual accomplishment. In both activities feel free to build on, react to, criticize, and analyze the ideas of others but, when you do, make it known by referencing your sources. You must explicitly acknowledge when your work builds on someone else's ideas, in particular the authors you read (e.g., from articles, websites). If you have questions about drawing the line between others' work and your own, ask for assistance and guidance to the professors.

While we encourage students to strongly interact and share ideas, any piece of individual or team work must be completed autonomously. Recycling assignments submitted by students or teams in your class, students or teams in other classes, or students or teams who have previously taken the class or recycling work you find in external sources such as the Internet will not be tolerated and will automatically receive a grade of zero. You will also face possible expulsion from the Engineering School.

## TENTATIVE COURSE SCHEDULE

The following table contains a tentative course schedule for the semester. For each day of class you can see the name of the instructor (MV = Matteo Vignoli; FD = Francesco D'Onghia; LM = Luigi Manca), the covered topic, the materials and readings in support of the understanding of the covered topics (see the section Materials and Readings for details on where to find them), and the due assignments. As for the latter, the items **in bold text** are the assignments that will be formally evaluated.

#	Date	Time	Instructor	Topic	Assignments due
	Monday 25/2			NO CLASS	
1	Tuesday 26/2	14-17	MV	Business Process Engineering introduction	
2	Thursday 28/2	10-13	MV	The Design Process	
3	Monday 4/3	10-13	MV	Teams design	
4	Tuesday 5/3	14-17	MV	Project Management	
5	Thursday 7/3	10-13	MV	Sense Intent	Pizza Video

6	Monday 11/3	9-13	MV+FD	Challenge Presentation	
7	Tuesday 12/3	14-17	MV	Needfinding	
8	Thursday 14/3	10-13	FD	Storytelling/Documentation	
9	Monday 18/3	10-13	FD	Qualitative data collection: interviews and observations	First Project Deliverable
10	Tuesday 19/3	14-17	MV	Business Process Modeling	
	Thursday 21/3	10-13		Business Process Modeling	
	Monday 25/3			NO CLASS	
	Tuesday 26/3			NO CLASS	
11	Thursday 28/3	10-13	FD	Qualitative data analysis	
			FD	Data Analysis Laboratory	Interview protocol; Trascripton of at least one interview and one observation; Text of a survey (optional)
12	Monday 1/4	10-13			
13	Tuesday 2/4	14-17	MV	Understanding Process Performance	
14	Thursday 4/4	9-13	MV+FD	Project Coaching	
15	Friday 5/4	9-13 14-18	LM	Simulation - 1 (1.5)	
16	Monday 8/4	10-13	MV	Framing Knowledge	
	Tuesday 9/4	14-17	Magnanini	Class of Sistemi di Controllo per il Management	
	Thursday 11/4			NO CLASS	
17	Monday 15/4	9-13	MV+FD	Second deliverable Presentation	Second project deliverable
18	Tuesday 16/4	14-17	MV	Design Principles and Ideation	
	Thursday 18/4			EASTER BREAK	
	Monday 22/4			EASTER BREAK	
	Tuesday 23/4			EASTER BREAK	
	Thursday 25/4			NATIONAL HOLIDAY	
	Monday 29/4			NO CLASS	
	Tuesday 30/4			NO CLASS	
	Thursday 2/5			NO CLASS	
19	Friday 3/5	9-13 14-18	LM	Simulation - 2 (1.5)	
20	Monday 6/5	9-13	MV+EM	Third deliverable Presentation	Third project deliverable
21	Tuesday 7/5	14-17	MV	Prototyping and designing business process	

23	Thursday 9/5	10-13	FD	Test and users' feedback + quantitative methods	
	Monday 13/5			NO CLASS	
24	Tuesday 14/5	15-18	LM	Simulation Lab	
25	Thursday 16/5	9-13	MV+FD	Project Coaching	
26	Friday 17/5	9-13 14-18	LM	Simulation - 3 (1.5)	
27	Monday 20/5	10-13	MV	Service Design	
	Tuesday 21/5			NO CLASS	
27	Thursday 23/5	9-13	MV+FD	Fourth deliverable Presentation	Fourth project deliverable
28	Monday 27/5	10-13	MV	Designing Change	
29	Thursday 30/5	9-13	MV+FD	Project Coaching	
	Tuesday 4/6	14-18	MV+FD	Final Presentation	Fifth project deliverable

### PROCEDURES TO EVALUATE OVERALL ATTENDANT STUDENTS' PERFORMANCE

In addition to the team efforts of project deliverables and the individual work on the take home paper, at the end of the course the students will undergo a written exam and an oral examination. In order to participate in the oral examination students need to score more than 18/30 on the two evaluated project deliverables, the take home paper, and the written exam.

The written exam is aimed at assessing the competences acquired in the areas of Business Process Modelling and simulation. The written exam will consist of a small case or of theoretical questions. The oral exam will focus mainly on a discussion about the team project. During the oral examination a student needs to show that he/she masters, also from a theoretical standpoint, the topics and materials that are presented in this syllabus.

The final individual evaluation will be based on:

- Team project 50% (team evaluation)
- Take home paper 20% (individual evaluation)
- Written Exam (Simulation Exercise) 10% (individual evaluation)
- Oral exam 20% (individual evaluation)
- Class participation 5% (individual bonus)

The specific evaluation criteria are reported in the following tables.

<i><b>Team evaluation</b></i>
<b>Project deliverables</b>
<p><b>Content:</b> Is the context correctly represented? Does it cover all the relevant needs? Does the story emerge? Are the stakeholders correctly presented and all their needs identified? Are the performances correctly designed?</p> <p><b>Methodological rigor:</b> Are the relevant tools used properly? Is the relevant literature cited and used?</p>



**Creativity and autonomous contribution:** Was the team able to go beyond what was asked? Is the deliverable surprising or notable in any form?

**Organization of work:** Is it clear who did what and how the project was organized? Is it reported the time the team and the individuals spent on the project?

**Presentation:** is the presentation clear and well crafted? Are all the materials cared for? Is the presentation representing a good story?

<i>Individual evaluation</i>			
Take home paper	Written Exam	Oral exam	Class participation
<p><b>Content:</b> Is the argumentation solid? Does it cover the team experience building on literature and reflection?</p> <p><b>Application of the theory to the personal experience:</b> Are theories adequately referred to? Are they clearly applied to the specific case?</p> <p><b>Presentation:</b> Are the arguments presented clearly, concisely and convincingly?</p>	<p><b>Content:</b> Are the theories and approaches related to business Process Modelling and simulation well mastered?</p> <p><b>Application of the techniques of Business Process Modelling and simulation to a case.</b> Are the relevant techniques applied to the specific case presented?</p>	<p><b>Project ownership:</b> Is the team member able to present properly every aspect of the project? Is his/her involvement with the project/organization evident?</p> <p><b>Ability to critically discuss the work:</b> Is the team member able to recognize critical aspects of the project and able to build on them? Is the team member capable of building on other's ideas and develop them further?</p> <p><b>Ability to orally present the work:</b> is the team member clear and concise in the presentation? Does the team member present the relevant aspects?</p>	<p><b>Participation in case discussion:</b> Did the student speak up in a constructive fashion? Did he/she pose interesting or thought provoking questions? Did he/she provide useful hints and comments?</p> <p><b>Interactivity with invited speakers:</b> Was the student present during the talks of invited speakers? Did he/she pose relevant and respectful questions?</p>

### EXAM EVALUATION FOR NON ATTENDANTS

While the materials and textbooks remain the same, the students who do not attend classes and do not participate in project activities will undergo a different examination process, consisting of:

- a take home paper with the discussion of a specific topic. Students should ask prof. Vignoli to be assigned a topic and the details on how to prepare the paper;
- a written exam of about 3 hours with:
  - o the discussion of a case of business process re-design, applying the specific tools and methods described in the texts, required readings and other materials on dolly;
  - o a multiple choice text or open-ended questions.
- a take home simulation project, distributed to students after the written exam;
- an oral exam.