

ENGAGE.EU Certificate  
Joint Programme in Digital Transformation

# Digital Technology

## Course Syllabus

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7-8 March 2025 & 14-15 March 2025<sup>1</sup>

### Course Abstract

This course is designed for students in master degree and helps them to understand, communicate, and adapt to a digital world as it impacts their personal life, society, and the business world. Students will not only understand the concepts but apply their knowledge to situations and defend their actions/decisions/choices through the knowledge and skills acquired in this course.

Employability skills are integrated into activities, tasks, and projects throughout the course standards to demonstrate the skills required by business and industry. Various forms of technologies will be highlighted to expose students to the emerging technologies impacting the digital world. Professional communication skills and practices, problem-solving, ethical and legal issues, and the impact of effective presentation skills are taught in this course as a foundational knowledge to prepare students to be career ready.

### Learning Objectives

Upon completion of this course, the students should be able to...

- ...name important components for management in the digital era
- ...demonstrate the logic and methodology in the management in the digital era
- ...apply digital technologies and data sources in practice
- ...assess different sources of data, including the specific of Big Data
- ...describe FinTech and Blockchain
- ...illustrate the importance of mobile devices

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<sup>1</sup> The teaching dates on Fridays might change due to teaching commitments to the later afternoon.

## Evaluation and Grading

The course will use a mix of lectures, case discussions and guest speakers. Problems from the “real life” will be used to help students apply their knowledge.

Participants’ grade will be composed of:

- 40% Individual presentation
- 60% Written essay

Individual presentation (40%) related to the main topics of the course.

The evaluation of the individual work is based on the following criteria:

- Argumentation of the topic: the essential information in the case is used to answer the questions
- Presenting an understanding of the main course topics
- Analysis and conclusions: Convincing analysis and conclusions supported by
- Facts and logical argumentation
- Lies
- Well-structured presentation

The presentation of the individual works will be held on 17th and 18th May 2024. Each presentation should be 20 minutes long.

Written essay (60%) - Students will write an individual essay on the contents taught in the Digital Strategy course. The essay structure is up to the student. The essay has to be not longer than 10 pages. All essays have to be send a week before their presentation (deadline: May, 10th).

## Readings

Mandatory Readings:

EMC Education Services, Data Science & Big Data Analytics Discovering, Analyzing, Visualizing and Presenting Data, Published by John Wiley & Sons Inc., USA

If.A. Ajah, H.F. Nweke, Big Data and Business Analytics: Trends, Platforms, Success Factors and Applications, MPDI, 2019

Ph. Russom, Big Data Analytics, TDWI (The Data Warehousing Institute), USA, 2011

Complementary Readings:

C. B. B. D. Manyika, “Big Data: The Next Frontier for Innovation, Competition, and Productivity,” McKinsey Global Institute, 2011.

D. R. John Gantz, "The Digital Universe in 2020: Big Data, Bigger Digital Shadows, and Biggest Growth in the Far East," IDC, 2013.

J. Manyika, M. Chiu, B. Brown, J. Bughin, R. Dobbs, C. Roxburgh, and A. H. Byers, "Big Data: The Next Frontier for Innovation, Competition, and Productivity," McKinsey Global Institute, 2011.

D. W. Hubbard, *How to Measure Anything: Finding the Value of Intangibles in Business*, 2010, Hoboken, NJ: John Wiley & Sons.

J. Cohen, B. Dolan, M. Dunlap, J. M. Hellerstein and C. Welton, *MAD Skills: New Analysis Practices for Big Data*, Watertown, MA 2009.

The R Project for Statistical Computing, "R Licenses." [Online]. Available: <http://www.r-project.org/Licenses/>.

The R Project for Statistical Computing, "The Comprehensive R Archive Network." [Online]. Available: <http://cran.r-project.org/>.

J. Fox and M. Bouchet-Valat, "The R Commander: A Basic-Statistics GUI for R," CRAN. [Online]. Available: <http://socserv.mcmaster.ca/jfox/Misc/Rcmdr/>.

G. Williams, M. V. Culp, E. Cox, A. Nolan, D. White, D. Medri, and A. Waljee, "Rattle: Graphical User Interface for Data Mining in R," CRAN. [Online]. Available: <http://cran.r-project.org/web/packages/rattle/index.html>.

J. MacQueen, "Some Methods for Classification and Analysis of Multivariate Observations," in *Proceedings of the Fifth Berkeley Symposium on Mathematical Statistics and Probability*, Berkeley, CA, 1967.

P.-N. Tan, V. Kumar, and M. Steinbach, *Introduction to Data Mining*, Upper Saddle River, NJ: Person, 2013.

M. Shouman, T. Turner, and R. Stocker, "Using Decision Tree for Diagnosing Heart Disease Patients," in Australian Computer Society, Inc., Ballarat, Australia, in *Proceedings of the Ninth Australasian Data Mining Conference (AusDM '11)*.

Androutsopoulos, J. Koutsias, K. V. Chandrinou, G. Paliouras, and C. D. Spyropoulos, "An Evaluation of Naïve Bayesian Anti-Spam Filtering," in *Proceedings of the Workshop on Machine Learning in the New Information Age*, Barcelona, Spain, 2000.

M. Steinbach, G. Karypis, and V. Kumar, "A Comparison of Document Clustering Techniques," *KDD Workshop on Text Mining*, 2000.

## Sessions

### FIRST SESSION: 7 March 2025, 12 pm – 6 pm

#### Topic 1: The Changing Role of Management in Digital Era

- Development of management in digital era
- Nature and essence of management in digital era
- How to change management successfully in digital era
- Management skills in digital era
- The changing role of management in digital era

#### Topic 2: Digital technologies today and in future

- The impact of digital technologies
- Technology diffusion in digital era
- Impact of digital technologies on the company's business model

#### Topic 3: Types of Analytics: Descriptive, Predictive, Prescriptive Analytics

### SECOND SESSION: 8 March 2025, 9 am – 3 pm

#### Topic 4: Introduction to Big Data Analysis

- Main overview of Big Data
- State of the Practice in Big Data Analytics;
- The key role of the new "ecosystem" of Big Data.

#### Topic 5: Life Cycle of Analytic Data

- Analytical Data Lifecycle Overview;
- Life Cycle Phases:
  - phase 1: "Discovery" of the data;
  - phase 2: Data preparation;
  - phase 3: Planning models for data analysis;
  - phase 4: Building the data analysis models;
  - phase 5: Presentation of the results of the analysis;
  - phase 6: Practical use of the obtained results.

#### Topic 6: Main Methods of Big Data Analysis (part 1)

- Data analysis using R
- Cluster analysis
- Linear regression

**THIRD SESSION: 14 March 2025, 12 pm – 6 pm**

**Topic 7: Main Methods of Big Data Analysis (part 2)**

- Classification
- Decision Tree
- ARIMA model
- Text analysis

**Topic 8: Introduction to FinTech**

**Individual presentations**

**FOURTH SESSION: 15 March 2025, 9 am – 3 pm**

**Topic 9: Introduction to Blockchain**

**Individual presentations**

## About the Lecturer

Sabrina Kalinkova is lecturer in department of Marketing and Strategic Planning of University of National and World Economy – Sofia, Bulgaria. In 2012 Sabrina Kalinkova obtained a bachelor degree in field of “Forecasting and Planning”, and in 2013 – Master degree in “Planning”. In 2017 a PhD degree in Planning is defended. The main scientific interest are in the field of national strategic planning and competitiveness; systems’ development in digital era; digital marketing.