

# Courses

## Analysis and Management of Cultural Heritage

Academic Year 2018 – 2019

### Advanced Methods for Complex Systems I

**Abstract:** This interdisciplinary course aims at introducing rigorous tools from statistical physics, information theory and probability theory to investigate real-world complex systems arising in different fields of research. First, some key aspects of complexity encountered in physical, biological, social, economic and technological systems will be reviewed. Then, emphasis will be put on the construction of theoretical models based on the concept of constrained randomness, i.e. the maximisation of the entropy subject to suitable constraints. This will lead to the introduction of maximum-entropy models that serve as mathematical benchmarks for the properties of highly heterogeneous complex systems. Special cases of interest include statistical ensembles of complex networks and of multivariate time-series with given properties. Comparisons between model outcomes and empirical properties will be presented systematically. Full mathematical derivations of the models, as well as methods of statistical inference, model selection and computer codes for parameter estimation on empirical data will be provided.

The course will include a combination of recent and ongoing research in the NETWORKS unit at IMT Lucca, thereby offering directions for possible PhD projects in this area.

Prerequisites: solid mathematical background, scientific curiosity, interest in multidisciplinary, passion for theory.

**Hours:** 20

**Professors/Lecturers:** Diego Garlaschelli (IMT Lucca)

**Available for:** Analysis and Management of Cultural Heritage

### Advanced Methods for Complex Systems II

**Abstract:** The second part of the course “Advanced Methods for Complex Systems” focuses on advanced practical applications of the concepts introduced in the first part. In particular, emphasis will be put on the successful areas of pattern detection and network reconstruction from partial information. Network pattern detection is the identification of robust empirical patterns (like scale invariance, clustering, assortativity, reciprocity, motifs, etc.) that are widespread across real-world networks and that deviate systematically from some null hypothesis formalised in terms of a suitable random graph model. The models introduced in part I will then be used here for pattern detection purposes. The problem of community detection will also be covered, with an emphasis on the differences between finding communities in network data and in correlation matrices constructed from (e.g. financial or neural) time series databases. The problem of network reconstruction from partial topological information will be addressed concentrating on the reconstruction of financial and interbank networks from node-specific properties, with the purpose of improving stress tests and systemic risk estimates in real markets and offering better tools to policy makers. The statistical physics methods recently found by central banks to be the best-performing reconstruction techniques will be reviewed in detail.

The course will include a combination of recent and ongoing research in the NETWORKS unit at IMT Lucca, thereby offering directions for possible PhD projects in this area. 3

Prerequisites: solid mathematical background, scientific curiosity, interest in multidisciplinary, successful completion of the course “Advanced Methods for Complex Systems I”. Note: completion of this second part of the course is not required in order to move on to the third part (parts II and III can be understood

in parallel independently of each other, after part I is completed), although it would surely provide a useful overview of practical motivations for part III.

**Hours:** 20

**Professors/Lecturers:** Diego Garlaschelli (IMT Lucca)

**Available for:** Analysis and Management of Cultural Heritage

## Advanced Methods for Complex Systems III

**Abstract:** The third part of the course “Advanced Methods for Complex Systems” focuses heavily on deeper theoretical aspects and their consequences. Particular emphasis will be put on the distinction between maximum-entropy models of complex systems with “soft” and “hard” properties. In statistical physics, the resulting models are known as the “canonical” and “microcanonical” ensembles respectively. Many of the results in statistical physics (e.g. the calculation of certain entropies), discrete mathematics (e.g. the combinatorial enumeration of possible configurations of a system with given properties), and information theory (e.g. the calculation of the maximum compressibility of information sequences) rely of the concept of “ensemble equivalence”, i.e. the asymptotic equivalence of soft and hard ensembles in the large size limit. Surprisingly, various complex systems have been found to violate the property of ensemble equivalence. For these systems, the standard approach is not appropriate and new developments are needed. Several intriguing challenges open up, including the uniform sampling of realisations of large complex systems, the combinatorial enumeration of systems with heterogeneous constraints and the recalculation of traditional information-theoretic bounds on communication. Examples of these open challenges will be provided, along with tentative solutions that are underway.

The course will include a combination of recent and ongoing research in the NETWORKS unit at IMT Lucca, thereby offering directions for possible PhD projects in this area.

Prerequisites: unlimited passion for theory and multidisciplinary, successful completion of the course “Advanced Methods for Complex Systems I”. Note: knowledge of the content of the course “Advanced Methods for Complex Systems II” is not required (parts II and III can be understood in parallel independently of each other, after part I is completed), although it would surely provide a useful overview of practical motivations for this part.

**Hours:** 20

**Professors/Lecturers:** Diego Garlaschelli (IMT Lucca)

**Available for:** Analysis and Management of Cultural Heritage

## Advanced Seminars (long seminar without exam)

**Abstract:**

**Hours:** 30

**Professors/Lecturers:** Maria Luisa Catoni (IMT Lucca)

**Compulsory for:** Analysis and Management of Cultural Heritage

## Advanced Topics in Archaeology I

**Abstract:**

**Hours:** 20

**Professors/Lecturers:** Riccardo Olivito (IMT Lucca)

**Compulsory for:** Analysis and Management of Cultural Heritage

How does space become a place? What are the architectural, functional, and perceptual mechanisms that allow humans to move from natural landscapes to anthropic landscapes?

The world is becoming increasingly urbanised, with increasingly denser and more complex cities. Not to mention the theme of networks and virtual spaces and places.

It is not surprising, then, that at present one of the most innovative fields of study aims at analysing the way space, especially the urban one, is created, transformed, and modified, in accordance with the needs of the people living within it.

In the field of archaeology as well these issues have recently become one of the main topics.

Thus, the aim of this course is to illustrate the different approaches that archaeologists have been using in dealing with space and place.

After a theoretical introduction, the first part of the course (lessons 1-4) will investigate how public and private spaces were/are architecturally and planimetrically arranged, and then used and lived.

In the second part (lessons 5-7), attention will be drawn to both ancient and modern perceptions of space/place. With the help of selected case studies, the course will investigate how actors and viewers not only arranged and used those spaces but also perceived and reproduced them through images. At the same time, the course will focus on modern tools and approaches aiming at reconstructing/retrieving the (ancient) experience of being in the world.

## Advanced Topics in Archaeology II

**Abstract:**

**Hours:** 20

**Professors/Lecturers:** Alessandro Poggio (IMT Lucca)

**Compulsory for:** Analysis and Management of Cultural Heritage

## Advanced Topics in Cultural Heritage Law

**Abstract:**

**Hours:** 20

**Professors/Lecturers:** Tbd

**Compulsory for:** Analysis and Management of Cultural Heritage

## Advanced Topics in Network Theory: Brain Networks

**Abstract:** We shall provide the theoretical basis of the measurements and analysis of the various kind of network we can define in the brain.

**Hours:** 10

**Professors/Lecturers:** Guido Caldarelli (IMT Lucca)

**Available for:** Analysis and Management of Cultural Heritage

## Advanced Topics in Network Theory: Statistical Mechanics of Networks

**Abstract:** Information theory, Exponential Random Graphs.  
Hypothesis testing on networks  
Reconstruction of networks.

Lecture 1: Basics of Information Theory  
Lecture 2: Complex Networks Randomization  
Lecture 3: Exponential Random Graphs  
Lecture 4: maximum Likelihood Estimation  
Lecture 5: Hypothesis testing on networks  
Lecture 6: Early warnings in economic and financial networks  
Lecture 7: Gravity Models of Trade  
Lecture 8: Reconstruction algorithms I  
Lecture 9: Reconstruction algorithms II  
Lecture 10: Reconstruction of interbank networks

**Hours:** 10

**Professors/Lecturers:** Guido Caldarelli (IMT Lucca)

**Available for:** Analysis and Management of Cultural Heritage

## Basic Neuro-Linguistics

**Abstract:** Language springs from distributed, basic as well as higher sensory and cognitive functions. The course will explore the evolutionary and neural bases of language development, from the low-level perceptual-motor stage to the combinatorial, attentive, mnemonic processes driving morphosyntax and eventually, semantics and conceptualization.

**Hours:** 12

**Professors/Lecturers:** Alessandra Rampinini (IMT Lucca)

**Available for:** Analysis and Management of Cultural Heritage

## Behavioral and Cognitive Neuroscience of Perception

**Abstract:** The course will review the physiological and anatomical bases of perception in humans and will consequently detail the neural bases of unimodal, multisensory and supramodal perception. The last part of the course will review recent observation in early and late blind individuals to understand how the (lack of) visual experience affects brain functional and structural development.

**Hours:** 48

**Professors/Lecturers:** Emiliano Ricciardi (IMT Lucca); Davide Bottari (IMT Lucca)

**Available for:** Analysis and Management of Cultural Heritage

## Business Model for Emerging Markets

**Abstract:** Teaching contents:

1. The economy of the intangibles
2. Manufacturing and robot
3. Strategy and business model

4. How to model a business
5. How to model a business in a complex scenario
6. What make market emerging? Not only new lands.
7. The Blockchain technology and the future
8. Initial Coins Offering (ICO) compressed between Business plan and White paper
9. Possible value of Blockchain technology for Small and medium Italian sized business
10. A global value chain approach to protect and foster strategic identity

Business case

Students will learn how to evaluate strategies, as well as how to locate sources of potential competitive advantage from a perspective that, for the purpose of this course, encompasses the internal and dynamic fit of a strategy. They will also learn how to identify organizational barriers and corporate behaviors that sustain or challenge the development and execution of strategies, and the competitive advantage of a company.

**Hours:** 20

**Professors/Lecturers:** Nicola Lattanzi (IMT Lucca)

**Available for:** Analysis and Management of Cultural Heritage

## Clinical Psychopathology and Psychiatry

**Abstract:**

**Hours:** 10

**Professors/Lecturers:** Pietro Pietrini (IMT Lucca)

**Available for:** Analysis and Management of Cultural Heritage

## Contextual Analysis and Individual Objects: Arts, Sciences, Techniques, Beliefs (the course includes research field trips)

**Abstract:** Contextual Analysis and Individual Objects: Arts, Sciences, Techniques, Beliefs (the course includes research field trips).

**Hours:** 30

**Professors/Lecturers:** Linda Bertelli (IMT Lucca)

**Compulsory for:** Analysis and Management of Cultural Heritage

## Critical Thinking (long seminar without exam)

**Abstract:** Constructing and evaluating arguments is fundamental in all branches of science, as well as in everyday life. The seminar provides the basic skills and tools to recognize correct forms of inference and reasoning, detect the unsound or fallacious ones, and assess the strength of various kinds of argument. The toolbox includes elementary deductive logic, naïve set theory, patterns of inductive and abductive inference, and elements of statistical and probabilistic reasoning. By engaging in real-world exercises of correct and incorrect reasoning, students will familiarize with the analysis of basic epistemological notions (truth vs. certainty, knowledge vs. belief, theory vs. evidence, etc.) and of common heuristics and biases as studied in cognitive psychology and behavioral economics. No previous knowledge of logic, philosophy, or advanced mathematics is required.

**Hours:** 10

**Professors/Lecturers:** Gustavo Cevolani (IMT Lucca)

**Available for:** Analysis and Management of Cultural Heritage

## Cultural Heritage and Law

**Abstract:** International Law, EU Law, and Domestic Law on Cultural Heritage. Basic elements of comparative law. Definition of Cultural Heritage. The institution of protection of cultural heritage in Italy. Fundamental principles and main public interests: protection, circulation, access. Problems and cases (Case law). - European Landscape Convention and Domestic Law on Landscape. Basic elements of comparative law. Principles and main issues: definition of landscape; levels of governance; public law instruments. Problems and cases (Case law).

**Hours:** 60

**Professors/Lecturers:** Lorenzo Casini (IMT Lucca)

**Compulsory for:** Analysis and Management of Cultural Heritage

## Culture and Arts: Economic Analysis and Public Policy

**Abstract:** Governmental intervention in culture; objects and objectives of policing action; the tools of governmental policing; the elaboration of policing programs.

**Hours:** 24

**Professors/Lecturers:** Stefano Baia Curioni (Bocconi)

**Compulsory for:** Analysis and Management of Cultural Heritage

## Data Analysis and Management for Cultural Heritage (long seminar without exam)

**Abstract:** The goal of the seminars is to introduce some of the most recent techniques for the management of complex data that can be applied to GLAMs (i.e.. Galleries, Libraries, Archives and Museums) related data. Attendees will get aware of the most advanced techniques for data management that can be used to boost the impact of GLAMs activities on various stakeholders, e.g., tourists, scholars, etc. Benefits deriving from these seminars are mainly three: awareness about the main technologies to organize and manage GLAMs' data and objects efficiently, practical examples of how to turn these data and objects into knowledge to be successively exploited, learn how to exploit people and visitors to improve the quality of GLAMs' offered services. The seminars are organized into three modules surveying different approaches and techniques for the storing, annotation, and retrieval of Cultural Heritage data. It firstly introduces the students to the issue of data management, in particular oriented towards texts. The second module illustrates some techniques for digital image understanding and users profiling, also discussing a number of data mining tools for the analysis of multimedia data. Finally, the third module is related to the novel,

but already important, topic of crowdsourcing as a way to involve people in the management cycle of GLAMs data.

**Hours:** 21

**Professors/Lecturers:** Tbd

**Compulsory for:** Analysis and Management of Cultural Heritage

## Decision-Making in Economics and Management

**Abstract:** The main goals of the course are:

(1) to take economic theories and methodologies out into the world, applying them to interesting questions of individual behavior and societal outcomes;

(2) to develop a basic understanding of human psychology and social dynamics as they apply to marketing contexts;

(3) to become familiar with the major theory and research methods for analyzing consumer behavior; (4) to develop market analytics insight into consumer actions.

Most of time will be devoted to close reading of research papers, including discussion of the relative merits of particular methodologies. Students will participate actively in class discussion, engage with cutting-edge research, evaluate empirical data, and write an analytical paper. The course aims at enabling students to develop and enhance their own skills and interests as applied microeconomists.

**Hours:** 10

**Professors/Lecturers:** Massimo Riccaboni (IMT Lucca)

**Compulsory for:** Analysis and Management of Cultural Heritage

## Designing the Cultural Experience: 3D Graphics for Cultural Heritage (long seminar without exam)

**Abstract:** The goal of the proposed PhD course is to introduce the new methodologies for the construction of high-quality digital 3D models of real artifacts/scenes and the potential utilizations of those models to support study, monitoring of conservation condition, restoration, education/learning and finally dissemination of our Cultural Heritage.

**Hours:** 25

**Professors/Lecturers:** Tbd

**Compulsory for:** Analysis and Management of Cultural Heritage

## East and West, Present and Past: The Cultural and Political Interplays between the Arabic World and Europe

**Abstract:** The course will consist of three main sections, historical, political, and aesthetic, respectively.

1) Historical Background: "Philosophy from West to East, to West again". Analysis of the

process through which a “terra franca” of philosophical culture spread in the Abrahamic monotheisms (Christianity, Islam, Judaism) around the Mediterranean Sea in the Middle Ages, and joined intellectuals belonging to each of these three religions in a trans-national scientific community. Basic information on the key-figures and moments of the process: from Aristotle to Dante Alighieri (d. 1321), passing through the Greek-into-Arabic and the Arabic-into-Latin translations of classical texts of philosophy, with special attention to the Islamic, Jewish, and Christian protagonists of the process, and to specific examples of trans-religious interaction. Reflexes of the philosophers’ views in Medieval art and iconography.

2) Political Perspective: “The Past and the Present”. Through the aforementioned process, a well-defined paradigm of intercultural synergy took shape in the Middle Ages for the first time in history: Greek philosophy, shared through translations, provided a common rational basis to distinct cultures, each one of which affirmed its own language, religion, and political status, but was nonetheless able to interact with the others at a high cultural level, notwithstanding religious and political antagonisms, thanks to the universalizing force of the shared philosophical tradition. The peak of Medieval rationalism is reached in Arabic-Islamic philosophy, which pursues the goal of a totally rational – and, by the same token, moderate and tolerant – version of the Muslim religion, in replacement of the more literalist and radical interpretation by theologians. This Medieval pattern holds significant actuality and can be applied in various ways to the contemporary scenario: it regards the role of education in multi-ethnic communities; the emergence of new international and a-confessional issues and concerns; the re-assessment of the “de-radicalizing” role of philosophy in contemporary culture. Discussion of the motives of “clash of civilizations”, “cultural roots of Europe”, and “radicalism vs. tolerance”.

3) Aesthetic Dimension: “Images in Texts, and Texts in Images”. On the one hand, a decorative apparatus of “Western” ascendance is an integral part also of Eastern medieval manuscripts of philosophy: illuminations highlight pivotal parts of the text, illustrations help understanding the content, and decorations depict visually the work in globo; the status of “image” in Eastern medieval philosophical manuscripts has peculiar cognitive aspects of its own, since the text is often copied in geometrical and artistic shapes, raising the issue of whether the text or the image is the copyist’s main aim and the reader’s prime visual object, and of the perceptive relationship between the two. On the other hand, the Arabic script, deprived of any conceptual meaning, detached from religious connotations, and taken simply as an image, appears frequently as a decorative element in Western pieces of art (paintings, sculptures, buildings).

**Hours:** 60

**Professors/Lecturers:** Amos Bertolacci (IMT Lucca)

**Compulsory for:** Analysis and Management of Cultural Heritage

**Also available for:** Economics, Networks and Business Analytics

## Firms, Business Analytics and Managerial Behavior

**Abstract:** Teaching contents:

1. Theory of the Firm
2. The system of force in a business organization
3. The balance between efficiency of the production and effectiveness in results
4. Business performance and ways to represent
5. The financial statement
6. How to read and comprehend performances and results
7. Methodology and tools for Balance sheet analysis
8. Prevision versus prediction and business analytics



9. Entrepreneurship and management in complex scenario
10. Neuroscience, decision making process and managerial behavior

#### Business case

Students will learn how to evaluate strategies, as well as how to locate sources of potential competitive advantage from a perspective that, for the purpose of this course, encompasses the internal and dynamic fit of a strategy. They will also learn how to identify organizational barriers and corporate behaviors that sustain or challenge the development and execution of strategies, and the competitive advantage of a company.

**Hours:** 20

**Professors/Lecturers:** Nicola Lattanzi (IMT Lucca)

**Available for:** Analysis and Management of Cultural Heritage

### Forensic Psychology and Psychiatry

**Abstract:**

**Hours:** 10

**Professors/Lecturers:** Pietro Pietrini (IMT Lucca)

**Available for:** Analysis and Management of Cultural Heritage

### Fossils, Apes, Humans. Digging the Antiquities of Nature

**Abstract:**

**Hours:** 12

**Professors/Lecturers:** Carlo Ginzburg

**Compulsory for:** Analysis and Management of Cultural Heritage

### Funding and Management of Research and Intellectual Property (long seminar without exam)

**Abstract:** The long seminar aims at providing an overview on the management of intellectual property rights (copyright transfer agreements, open access, patents, etc.). Funding opportunities for PhD students, post-docs, and researchers are also presented (scholarships by the Alexander von Humboldt Foundation; initiatives by the Deutscher Akademischer Austausch Dienst; scholarships offered by the Royal Society in UK; bilateral Italy-France exchange programmes; Fulbright scholarships; Marie Curie actions; grants for researchers provided by the European Research Council). For each funding scheme, specific hints on how to write a proposal are given.

**Hours:** 10

**Professors/Lecturers:** Marco Paggi (IMT Lucca)

**Available for:** Analysis and Management of Cultural Heritage;

### History of Ancient Art and Archaeology: Arts and Politics

**Abstract:** Visits to monuments and cultural Italian sites and to the organizational offices; invitation of international managers of museum and cultural sites.

**Hours:** 60

**Professors/Lecturers:** Maria Luisa Catoni (IMT Lucca)

**Compulsory for:** Analysis and Management of Cultural Heritage

## History of Early Modern and Modern Art

**Abstract:**

**Hours:** 30

**Professors/Lecturers:** Carl Brandon Strehlke (Philadelphia Museum of Art)

**Compulsory for:** Analysis and Management of Cultural Heritage

## Introduction to Cognitive and Social Psychology

**Abstract:** This course will provide an introduction to general themes in Cognitive and Social Psychology. In the first part of the course, we will review seminal findings that had a major impact on our knowledge of cognitive processes and social interactions, as well as more recent studies that took advantage of neuroimaging, electrophysiology and brain stimulation methods to shed new light on decision-making and social behaviors. During the second part of the course, students will be asked to perform a brief presentation of a research article and to critically discuss positive aspects and limitations of the study. The course will include seminars and lectures by renowned researchers in the field and will educate PhD candidates about the influence of social aspects of the human nature on cognitive and brain functioning (and vice-versa) in an intellectually motivating manner.

**Hours:** 24

**Professors/Lecturers:** Pietro Pietrini (IMT Lucca); Emiliano Ricciardi (IMT Lucca)

**Available for:** Analysis and Management of Cultural Heritage

## Introduction to Complex Systems and Networks

**Abstract:** Complexity, self-similarity, scaling, self-organised criticality.  
Definition of graphs, real networks and their properties.  
Models of static networks, models of network growth.

Lecture 1 Graph Theory Introduction  
Lecture 2 Properties of Complex Networks  
Lecture 3 Communities  
Lecture 4 Different Kind of Graphs  
Lecture 5 Ranking  
Lecture 6 Static Models of Graphs  
Lecture 7 Dynamical Models of Graphs  
Lecture 8 Fitness Models  
Lecture 9 World Trade Web  
Lecture 10 Financial Networks

**Hours:** 10

**Professors/Lecturers:** Guido Caldarelli (IMT Lucca)

**Available for:** Analysis and Management of Cultural Heritage

## Management of Complex Systems: Approaches to Problem Solving

**Abstract:** Methods and approach to problem solving. Problem analysis; analysis of complex systems (related to cultural heritage, such as a city of art organization, promotion, etc.). The course will include practical simulations. The course will be linked to a seminar on specific case studies.

**Hours:** 40

**Professors/Lecturers:** Andrea Zocchi; Dario Cacciatore (Whirlpool Corporation)

**Compulsory for:** Analysis and Management of Cultural Heritage

## Models of Organization of Cultural Institutions

**Abstract:** Analysis of organizational models of museums in Italy. Main organizational models of museum and cultural institutions in USA and Europe; structures and institutions of "tutela" in Italy. Management models.

**Hours:** 30

**Professors/Lecturers:** Paola Dubini (Bocconi)

**Compulsory for:** Analysis and Management of Cultural Heritage

## Museology and History of Collecting

**Abstract:** History of collecting; management forms of early collections. Theoretical reflections on the phenomenon of collecting. Emerging themes in early collections: private and public goods, ownership of the collection/fruition of the collection. Organizational structure of museums in Italy, France, UK and USA. Elements of museology. The communication strategies of museums in Italy, Europe, USA. The specificity of Italian cultural heritage and its museological management.

**Hours:** 60

**Professors/Lecturers:** Emanuele Pellegrini (IMT Lucca)

**Compulsory for:** Analysis and Management of Cultural Heritage

## Neurobiology of Emotion and Behavior

**Abstract:**

**Hours:** 12

**Professors/Lecturers:** Pietro Pietrini (IMT Lucca)

**Compulsory for:** Economics, Networks and Business Analytics

**Also available for:** Analysis and Management of Cultural Heritage

## Philosophical and Ethical Themes in Neuroscience

**Abstract:** Since its formal establishment as a self-standing field, neuroethics has been divided into two subdefinitions: the neuroscience of ethics and the ethics of neuroscience. While the neuroscience of ethics aims at explaining the way our brain works in relation to moral judgement, the ethics of neuroscience is a further expansion of bioethics: a discipline that wants to assess the moral dilemmas specifically raised by recent biotechnological advancements. As suggested by the title, this introductory course will focus on neuroethics in this latter sense, underlining the impact that discoveries concerning our brain can, do or will have on our society. Speculating over the ethical and political acceptability of certain innovations in the light of classical philosophical questions (i.e. What is justice? What constitutes a good life?) and other key terms necessary to understand the current debate (i.e. authenticity and personal identity, autonomy, responsibility and competence) will provide the groundworks for any further neuroethical investigation envisaged.

**Hours:** 10

**Professors/Lecturers:** Mirko Daniel Garasic

**Available for:** Analysis and Management of Cultural Heritage

## Philosophy and Neuroscience in Moral Reasoning

**Abstract:** The analysis of moral reasoning and surrounding topics – how to assess “good” and “bad” actions, how to choose between them, how to justify these choices – is a classical problem of moral philosophy (ethics). More recently, moral psychologists started tackling those problems using a descriptive, empirically based approach. Still more recently, “neuroethicists” began investigating the neural correlates of moral judgment and the implications of neuroscientific results for moral philosophy. The course is an introduction to the essential issues arising at the interface of neuroscience, moral psychology, and moral philosophy. We shall explore problems concerning the biological and neural bases of moral thinking, the role of emotions in moral reasoning, the significance of empirical results for normative theories of morality, and some methodological issues arising within neuroethics. Students are expected to read in advance the papers discussed on each class and to give a brief oral presentation of a topic of their choice.

**Hours:** 12

**Professors/Lecturers:** Gustavo Cevolani (IMT Lucca)

**Available for:** Analysis and Management of Cultural Heritage

## Philosophy of Science (long seminar without exam)

**Abstract:** This is an introduction to the basic concepts and problems in the analysis of scientific reasoning and inquiry. The seminar will focus on some central patterns of reasoning and argumentation in science and critically discuss their features and limitations. Topics covered include the nature of theory and evidence, the logic of theory testing, and the debate about the aims of science and the trustworthiness of scientific results. We shall discuss classical examples and case studies from the history and practice of scientific inquiry to illustrate the relevant problems and theoretical positions. Students will freely engage in brainstorming on these topics and are welcome to propose examples, problems, and methods from their own disciplines. No previous knowledge of either logic or philosophy is required.

**Hours:** 10

**Professors/Lecturers:** Gustavo Cevolani (IMT Lucca)

**Available for:** Analysis and Management of Cultural Heritage

## Project Management

**Abstract:** Project management; event management; communication and marketing; practical tools of organization; budgeting. Dealing with multiple stakeholders/ Risk management / Time management / PM tips to run an international research/Management plan concept on heritage sites / When applying for funds how do we measure project success / How we manage the output of the management plan / Flat organisations.

**Hours:** 35

**Professors/Lecturers:** Beatrice Manzoni (Bocconi)

**Compulsory for:** Analysis and Management of Cultural Heritage

## Science Integrity and Misconduct

Abstract:

1. Introduction
  - a. The age of scientific fraud
  - b. FFP (Fabrication, Falsification, Plagiarism)
  - c. Error, misconduct, fraud
2. Great scientists, successful cheaters
  - a. Is scientific fraud a new phenomenon?
  - b. Accused: famous scientists were fraudsters?
  - c. Present vs past
3. Fraudulent images
  - a. Scientific images as data
  - b. Introduction to fraudulent image manipulation
  - c. Image manipulation detection
  - d. Large scale analysis of image manipulation
4. The numbers of scientific disguise
  - a. Lying with numbers
  - b. Detection of numerical manipulations
  - c. Large scale studies
5. Stealing into print
  - a. What is plagiarism
  - b. Plagiarism detection
  - c. Large scale studies
6. The aftermath of fraud
  - a. Damage to Science
  - b. Economic costs
  - c. Effects on our lives
  - d. Personal effects
7. Personal and systemic factors causing misconduct
  - a. Individual factors connected to scientific fraud
  - b. Systemic incentives to fraud
  - c. The social components of scientific fraud
8. What can be done?
  - a. Changing the weight of publications in academic's career: proposals
  - b. Education: do current efforts succeed?
  - c. Editorial Policies
    - Open data policies: current status and perspectives

- COPE
- ORCID
- d. International academic policies
  - Declarations (S. Francisco, Singapore)
  - The position of EU
- e. Local academic policies
  - Dedicated Institutions: ORI
  - The German way: Ombudsmen and other systems
  - Italy: CNR, Federico II and other guidelines
- f. Lab policies
  - Italian examples
- g. Legal policies
  - Administrative and internal (no judiciary intervention)
  - Judiciary (with a review of international trials and sanctions)
- 9. Beyond scientific fraud: research ethics
  - a. Introducing Ethics in Science
  - b. 3 rules for responsible scientists
  - c. Experimenting with humans and animals
  - d. Unethical behaviours in publishing

**Hours:** 18

**Professors/Lecturers:** Enrico Bucci (Resis S.r.l.)

**Compulsory for:** Analysis and Management of Cultural Heritage; Cognitive, Computational and Social Neurosciences

## Scientific Writing, Dissemination and Evaluation (long seminar without exam)

**Abstract:** In order to ensure their widest possible dissemination, research results need to be presented in academic publications and in talks. The first goal of this course is to introduce students to basic principles of academic writing and on basic techniques to plan and deliver good academic talks. In addition, the course discusses the key principles of peer review, which is what makes science reliable knowledge. In particular, the course focuses on how to write a professional referee report.

**Hours:** 8

**Professors/Lecturers:** Tbd

**Available for:** Analysis and Management of Cultural Heritage

## Strategies and Business Behavior

**Abstract:** Teaching contents:

1. Market and strategy
2. Business and behavioral strategy
3. A new dimension for space and time in organization and strategy
4. Optimization and decision modeling on strategic decision making
5. Skills, competence and a new role of the human being
6. Business behavior as managerial evidence
7. Business plan: the role and function
8. Big data & decision-making process
9. Big data, machine learning for Management science

## 10. A multidisciplinary approach to business behavior.

Business and Behavioral Strategy offers an essential view of the corporate decision-making involved in orchestrating the strategy process - the key ideas, concepts, and tools - and answer to questions like why firms adopt different strategies and structures, why heterogeneity persists. The course will describe the decision-making in competitive markets at the business unit level in which many key strategic choices and actions are formulated and undertaken. The essential "tool-kit" that combines a broad understanding of competitive strategy analysis and the decision-making will be taught in a journey through the frameworks of the analytical and behavioral processes. The course is divided into three parts. 1. The first focuses on the strategy problem. This part of the course starts by proposing vocabulary and models, which help understand how corporate behaviors influence corporate strategy and sustain (or tackle) competitive advantage depending on the size of the company.

Topic points:

- context and principles of strategic management;
- organizational behavior in entrepreneurial and family firms.

2. The second part focuses on how turning the data and judgment into a decision. It tackles the question of how an executive and business unit can locate opportunities to achieve sustained competitive advantage thanks to the contribution of management science framed within the strategy formulation analytical process.

Topic points:

- optimization and decision modeling;
- problem structuring;
- strategic decision making.

3. The third part focuses on how competency and behavior affect the development and execution of a successful strategy. This part of the course concludes with a discussion of why good analysis in the hands of managers who have good judgment won't naturally yield good decisions. Strategic leaders should be not only competent to read market forces but also competent "practitioner psychologists," and what developing such competencies entails. This discussion will help surface the biases to which the decision process under review is particularly prone.

Topic points:

- cognitive biases, organization, entrepreneurial and family firm survival;
- the psychology of strategy, rational heuristics and cognitive biases.

### Business case

Students will learn how to evaluate strategies, as well as how to locate sources of potential competitive advantage from a perspective that, for the purpose of this course, encompasses the internal and dynamic fit of a strategy. They will also learn how to identify organizational barriers and corporate behaviors that sustain or challenge the development and execution of strategies, and the competitive advantage of a company.

**Hours:** 20

**Professors/Lecturers:** Nicola Lattanzi (IMT Lucca)

**Available for:** Analysis and Management of Cultural Heritage

## Topics in the Philosophy of Culture

**Abstract:** From the nineteenth century onwards, the term "philosophy of culture" has been used to refer to the philosophical inquiry into the guiding principles of cultural phenomena, the validity claims of cultural values, as well as culture's relation to human nature and the social world. Thinkers such as Ernst Cassirer and Georg Simmel have laid the foundation of this field of study, by pursuing a way of doing philosophy that was in constant dialogue with both the humanities and the social sciences. Favoured topics in the philosophy of culture are the concepts of "symbol" and "expression", the problem of the interpretation of

artworks, the value of cultural heritage, the dynamics of cross-cultural exchanges. The course aims at introducing students to this broad set of topics by selecting a number of readings that may vary from year to year. It also seeks to highlight the importance of keeping a properly philosophical perspective on culture even when one's interest lie in empirical research or in practice-oriented issues.

**Hours:** 30

**Professors/Lecturers:** Tbd

**Compulsory for:** Analysis and Management of Cultural Heritage

## Topics in Visual Arts

**Abstract:**

**Hours:** 12

**Professors/Lecturers:** Emanuele Pellegrini (IMT Lucca); Maria Luisa Catoni (IMT Lucca); Linda Bertelli (IMT Lucca)

**Available for:** Analysis and Management of Cultural Heritage

## Visual Arts and Globalization (long seminar without exam)

**Abstract:**

**Hours:** 10

**Professors/Lecturers:** Michele Dantini (Università per Stranieri di Perugia)

**Compulsory for:** Analysis and Management of Cultural Heritage