# Advanced research methods for consumer intelligence

## Prof. Guendalina Graffigna; Prof. Riccardo Negrini

### UNIT 1

***COURSE AIMS AND INTENDED LEARNING OUTCOMES***

 The course aims to offer an overview on the main methods and instruments of Quali-Quantitative Psycho-Social Research applied to the Agrifood System. In particular, the course will highlight the main research designs and approaches used in marketing research to study consumers’ attitudes towards food consumption and to support the generation of intelligence related to individual behaviours within the Agrifood System. The course will offer practical occasion to experiment the methodological and technical principles of qualitative and quantitative pycho-social research on real case studies.

 The course intends support students in acquiring introductory knowledge and skills related to qualitative and quantitative psycho-social methods and techniques applied to marketing research about the food sector to sustain decision making in the Agrifood System. In particular, at the end of the course, students are expected to acquire the skills and competences to designing qualitative research projects aimed at (1) generate knowledge about marketing research used in the food sector to deepen food choices and consumptions behaviours (2) sustaining creative decision making by generating insight on new future consumption trends in the field.

More into details, the Course has the following objectives

***Knowledge and understanding***

At the end of the course, the student will be able to know and understand:

1. the main methods and design of applied psycho-social and marketing research

2. the main qualitative research techniques

***Applying knowledge and understanding***

At the end of the course, the student will be able to:

1. Identify the marketing research which require the application of qualitative methods to the study of consumption trends and behaviors

2.correctly select among the different designs, methods and techniques for achieving the stated research objectives

***Making judgements***

At the end of the course, the student will be able to:

1. recognize the research questions which require a qualitative or quantitative psycho-social or marketing-based approach to the analysis of consumer food behaviours

2. select among the main marketing designs models and psycho-social approaches to produce knowledge on food consumption behaviours

***Communication skills***

At the end of the course, the student will be able to:

1. mastering the technical language in describing the processes and requirement of rigorous consumer-based research

2. argument with adequate confidence for the choice of one specific methodological approach and analysis model to assess food consumption behaviours

***Learning skills***

At the end of the course, the student will be able to:

1.autonomously critically assess one own level of knowledge and skills in the design of psycho-social or marketing researches for intelligence on food consumption behaviours

2. identify adequate sources to deepen and improve their knowledge about qualitative and quantitative methodologies applied to food consumption research

***COURSE CONTENT***

|  |  |
| --- | --- |
|  | CFU |
| Introduction to psycho-social and marketing research: the difference between qualitative and quantitative methods to study food consumption behaviours; principle of project design and management | 1.0 |
| Mixed Methods research for marketing decision making: a taxonomy of research design and case of application  | 1.0 |
| Basic of survey questionnaires  | 1.0 |
| Basic of focus groups and observations  | 0.5 |
| Basic of qualitative data analysis and reporting | 0.5 |
| Sampling methods |  0.5 |
| Basic of qualitative interview |  0.5 |

***READING LIST***

G. GRAFFIGNA, G. CASTELLINI, *Course Guidelines*

Mariampolsky Hy, *Qualitative Marketing Research: A Comprehensive Guide*. Sage, 2001

Kolb, B. M. (2021). *Absolute Essentials of Marketing Research*. Routledge.

***TEACHING METHOD***

 The course will adopt a highly experiential and interactive didactic approach.

 Moment of frontal lecturing will alternate with discussion of case histories and exercises in class under the supervision of the Professors

***ASSESSMENT METHOD AND CRITERIA***

A written exam will be proposed consisting in a marketing research problem related to the Agrifood System to be solved with the design of a psycho-social research project on consumer behaviours. Students will be required to briefly outline the research design which they consider the most appropriate to answer to the problem proposed. They will have to describe the research design in terms of: knowledge objectives, sampling, data collection techniques, expected results. They will also have to motivate their methodological choices.

The assignment will be evaluated in terms of appropriateness of the methodological and technical choices made, completeness of the design description, coherence among the methodological and technical choice made in the research design. Critical reflection on the methodological approaches used in the assignment will be valued.

***NOTES AND PREREQUISITES***

The course does not require content-related pre-requisites. However, interest and intellectual curiosity in the course topics are assumed

*Office hours for students*

Professor Guendalina Graffigna and Greta Castellini will receive students after classes or by appointment

## UNIT 2: Artificial Intelligence, Machine Learning and Big Data

***COURSE AIMS AND INTENDED LEARNING OUTCOMES***

This course aims at introducing the students to tolls and models for quantitative and qualitative data analysis. The course will reinforce students’ previous knowledge in statistics and expand a focus on multivariate statistics, generalised linear models, and analysis of chronological series. The most common Machine Learning approaches, their requirements, applications, and limitations, will be introduced along with some practical examples. The course will also provide the basic knowledge on the informatics and statistical tools involved in the analysis of high-dimensional data (Big Data).

***Knowledge and understanding***

At the end of the course, the student will be able to know and understand:

1. the main statistical methods and experimental design for qualitative, categorical and quantitative data

5. the outputs of the data elaboration, being able to describe and properly interpret the results obtained.

***Applying knowledge and understanding***

At the end of the course, the student will be able to:

1.Use informatics to extract, explore and manipulate information from low- and high-dimensional datasets.

3.Identify the most suited framework for a given hypothesis-testing scenario.

4.Build a coherent and functional analysis pipeline including basic bespoke functions when appropriate.

6.Complement the results with the most appropriate graphical representations.

***Critical thinking***

At the end of the course, the student will be able to:

1. recognize the research questions, critical revise information and data available, create meaningful experimental design and compare hypothesis

2.Formulate precise questions and identify the best statistical tool to test the hypotheses.

***Communication skills***

At the end of the course, the student will be able to:

1. mastering the technical language in interpreting and describing the statistical results

2. argument with adequate confidence the experimental design applied, and the statistical methods adopted.

***Learning skills***

At the end of the course, the student will be able to:

1. autonomously critically assess one own level of knowledge

2. identify adequate sources to deepen and improve their knowledge about statistical techniques applied to food consumption research and suitable for qualitative and quantitative data

3. improve their coding ability autonomously exploiting E learning and other open-source training tools

## COURSE CONTENT

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| **Topics** | **CFU** |
| Recap of exploratory statistics:* Describing data and variability.
* Probability distributions and descriptors (Binomial, Poisson, Chi Squared, Student T, Normal).
* Introduction to Hypothesis testing
* Confidence intervals
 | 1.00 |
| Basic concepts on probability and counting:* Probability rules and applications.
* Permutations and combinations
* Conditional probability
 | 0.50 |
| Introduction to statistical inference:* Comparing populations (small and large samples).
* Correlation and regressions
* Statistical models, ANOVA, GLM and GLMM.
 | 1.00 |
| Non-parametric data and beyond:* Non-parametric test (Sign test, Kruskall-Wallis, Wilcoxon, rank correlation.
* Time series analysis
* Introduction to multivariate techniques (MDS, PCOOA)
 | 1.00 |
| High-dimensional data and statistical learning * Introduction on supervised, unsupervised and reinforcement learning.
* Classification problems: PLS-DA and Random Forest.
* Introduction on Neural Networks and deep-learning.
 | 0.50 |
| **Practical** |  |
| * Introduction to R programming.
* Data types and data editing.
* Algorithm thinking and main constructs.
* Plots, graphical representations, and reports in R.
* Introduction to the most common data analysis packages
 | 1.00 |

## READING LIST

Reading material, references, presentations, and code will be made available at the end of each section of the course.

## TEACHING METHOD

The teaching method will combine lectures and practical activities. Lectures will cover the theoretical topics of the course, while providing a set of real-life examples relevant to the professional careers. The practical activities will aim at reinforcing the theoretical information and convert them in practical skills. Lectures will be delivered through frontal teaching. If the current health emergency prevents frontal teaching, remote teaching can be achieved through synchronous or asynchronous lectures

## ASSESSMENT METHOD AND CRITERIA

At the end of the course the students will be graded following a written tests (total maximum score is 30/30 consisting in a combination of multiple-choice questions and exercises. Each multiple-choice question correctly answered (in full) will award 2 points, incorrect or partially-correct answers will be awarded proportionally less points. Exercises will be awarded from 2 to 6 points according to the difficulty (exercise value will be reported in the test).

The sum of quiz and exercise will produce the final score.

## NOTES AND PREREQUISITES

* Knowledge of elementary statistics concepts will be helpful.

***OFFICE HOURS FOR STUDENTS***

Prof. Riccardo Negrini is available to meet students upon request at the Department of Animal Science, Food and Nutrition (DIANA).