

## Data Modelling Strategies – Capstone Courses

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### Course Description:

We offer brief courses for NYUAD Capstone Students who aim to develop a better understanding of research and statistical methods. These capstone courses will help students to interpret published research studies or start their own research. Our capstone courses are meticulously crafted to cater to the unique needs of NYUAD students, ensuring they receive a well-rounded education in research and statistical methods. Through engaging lectures, hands-on exercises, and interactive discussions, we foster an environment that encourages active learning and critical thinking. Choose our capstone courses to unlock your potential, broaden your horizons, and cultivate a comprehensive understanding of research and statistical methods. Empower NYUAD students to interpret published research studies effectively or embark on their own independent research journey.

### Prerequisites:

- Basic knowledge of statistics, including concepts of probability, hypothesis testing, and descriptive statistics.
- Knowledge in a statistical software package (e.g., R, STATA) is recommended.

### Course Objectives:

By the end of this course, students will possess the knowledge and skills necessary to approach data modelling and decision-making with confidence, utilizing statistical modeling to extract valuable insights and drive informed decisions.

### Course Outline:

#### Module 1: Introduction to research design and methodology

- Defining the research problems / questions
- Identifying the research study population
- Elimination of confounding
- Authored study protocol

#### Module 2: Study sample size

- Pilot study
- Power and sample calculation
- Sample size justification

#### Module 3: Introduction to principles of statistical analysis

- Strategy data analyses
- The art of results presentations
- Misinterpretation of statistical analysis results

Module 4: Introduction to empirical research literature

- Studying a research paper
- Reading statistics in published papers
- Writing a scientific paper

Module 5: Introduction to some common problems in empirical research

- A basic introduction to research strategies
- Statistical method of studies comparisons

Textbook:

- Christian Heumann, Michael Schomaker, Shalabh. Introduction to Statistics and Data Analysis with Exercises, Solutions and Applications in R. ISBN 978-3-031-11832-6, ISBN 978-3-031-11833-3 (eBook) <https://doi.org/10.1007/978-3-031-11833-3>