RESEARCH PROJECT IN INNOVATION AND TECHNOLOGY MANAGEMENT

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| Course code | *GRAI023* |
| Course title | *Research project in innovation and technology management* |
| Type of course | *Compulsory* |
| Stage of study | *Graduate* |
| Year of study | *1st* |
| Semester | *1st* |
| Number of credits | *6 ECTS; 18 hours of theory and 16 hours of practice in classroom, 128 hours of self-study,* |
| Lecturer |  |
| Prerequisites | *Undergraduate diploma* |
| Form of studies | *Full-time* |
| Teaching language | *English* |

**Course description**

The ability to formulate the right questions and choose the most efficient tools for seeking answers, as well as to intelligently interpret the information gathered and presented by others, is indispensable for those who want to succeed in today’s highly complex business environment. This course will equip students with both the understanding of principles that guide quality research and the tools of innovation and technology management needed to implement those principles in formulating a research project, selecting appropriate methods, collecting and analyzing data, and presenting their findings. We will focus on the practical application of the concepts and methods discussed in the course by conducting students’ own research projects and critically analyzing the research of others.

**Course aim**

The main goal of this course is to impart knowledge and skills necessary for conducting and evaluating research in innovation and technology management field. The course will begin with the introduction to the fundamental principles that underlie approaches to research and the practical implications of these principles, including formulation of research questions, concepts of validity and reliability, and issues of research ethics. We will then proceed to unpack the main qualitative and quantitative methods used in business research. Conducting their own research projects will help develop students’ practical research skills, and analysis of published research and other students’ research projects will sharpen their ability to critically evaluate the information coming from research conducted by others. Presentation of their own research findings and discussion of others’ research will also serve to refine the students’ presentation and communication skills. Students who have successfully completed the course and all its assignments will be able to define the research question, formulate the research design, choose the appropriate methods for data collection and analysis, present and apply their findings, and critically evaluate other researchers’ output. Finally, the skills and knowledge gained in this course will also be employable during the preparation of their final theses.

**Learning Outcomes of the Course**

On completion of this course successful students will:

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| Course learning outcomes (CLO) | Study methods | Assessment methods |
| CLO1. Critically evaluate the relevance of business research in managerial decision-making. | In-class activities, individual study | Participation, research project, exam |
| CLO2. Have a critical awareness of research issues, methodologies, and methods used in business and management as well as understanding of potential ethical problems of the research. | In-class activities, individual study, home assignments | Participation, research project, exam |
| CLO3. Obtain skills and analytical competences to identify a business problem/ need, translate it into a research question, and design an appropriate way to answer it. | In-class activities, individual study, home assignments, presentation | Participation, research project, exam |
| CLO4. Be able to use the main qualitative and quantitative strategies of business research. Evaluate their advantages and disadvantages and appropriate application areas. | In-class activities, individual study, home assignments | Participation, research project, exam |
| CLO5. Develop skills and analytical competences to design a research project and collect data. | In-class activities, team work, individual study, home assignments | Participation, research project, exam |
| CLO6. Obtain skills to analyze data and draw reasonable interpretations as well as communicate research findings in a clear and well organized way. | In-class activities, individual study, home assignments | Participation, research project, exam |
| CLO7. Develop skills to critically evaluate the quality of other researchers‘ findings and the process used to obtain them. | In-class activities, individual study, home assignments | Participation, research project, exam |

**Quality Assurance Measures**

The lecturer assures a variety of teaching methods and timely feedback to students. The feedback from students will always be highly valued and appreciated. The course is designed to maximize active engagement by students in their own learning process and the successful achievement of the learning outcomes is dependent upon the quality of such engagement. Depending on the particular situation in class, this syllabus may be adjusted, in that case the students will be informed during lectures and via the e-learning notification system.

Course content

| **Day** | **Topic** | **Contact Hours** | | **Readings, notes** |
| --- | --- | --- | --- | --- |
| **Lecture** | **Seminar** |
| 1 | **Lecture 1. Introduction to the course. Role of Research. Research Process and Proposals**  Purpose of research. Fundamental approaches to research. Definition, scope, significance, ethics and limitations of business research. Identification of business problem/ need. Formulation of research problem. Definition of research design. Types of research design. Exploratory research. Conclusive research. Evaluative research. | 2 |  | Hair et al., Chs.1, 2 |
| **Seminar 1.** In class assignment -- Choose a potential problem to study for your thesis. Identify your research problem. |  | 2 |  |
| 1 | **Lecture 2. Secondary data. Literature review.**  Types of data. Primary and secondary data and their collection methods. Advantages & limitations of secondary and primary data. Literature review and Hypotheses  Exploratory and Observational Research. Introduction to digital analytics – Google analytics | 2 |  | Hair et al., Ch.3, Ch 4 |
| **Seminar 2.** In Class assignment – Refine your research question and identify at least 2 exploratory research methods to refine your research question. Create a rough conceptual diagram of your research. |  | 2 |  |
| 2 | **Lecture 3. Descriptive and Causal Research Designs**  Typical survey and experimental research designs. | 2 |  | Hair et al., Ch.5 |
| **Seminar 3.** In Class exercise – defining general type of research design. Compare and contrast the advantages and disadvantages of survey and experimental research designs for your research question. |  | 2 |  |
| 2 | **Lecture 4. Sampling.**  The sampling design process. Probability sampling techniques and nonprobability sampling techniques. Sample size determination.  Bonus: A few words about writing papers. | 2 |  | Hair et al., Ch.6, |
| **Seminar 4.** Homework in class  **Homework:** Calculating and defining the sample for your research projects. |  | 2 |  |
| 3 | **HOMEWORK DUE BEFORE BEGINNING OF CLASS Oct 25**  Interim Part 1 of your project is due before class via e-learning system  **Seminar 5. Presentation of Part 1 in class – Half class randomly selected** |  | 2 |  |
| 3 | **Lecture 5. Measurement and Scaling**  Levels of measurement and why they are important. Measurement scales for abstract properties. | 2 |  | Hair et al., Ch.7 |
| **Seminar 5. Data Definitions Table** |  | 2 |  |
| **Lecture 5. Designing a Survey**  Development of questionnaires. Questionnaire design process, choosing question structure, choosing question wording, determining the order of questions. Personal interviews. Telephone survey. Mail survey and other methods of survey. Advantages and disadvantages of different methods of survey. Errors in survey research. Particularities of fieldwork in survey research. | 2 |  | Hair et al., Ch. 8 |
| 3 | **Lecture 6. Data collection: Observation.**  Observation methods. Advantages and disadvantages of observation. Personal observation, mechanical observation, audit, content analysis, trace analysis, experiments. | 2 |  | Hair et al., Ch.5, pp.106-132. |
| **Seminar 6.** Homework presentation and commentary. Consultation on research projects |  | 2 |  |
| 4 | **Presentation of project Part 1** |  | 2 |  |
| 4 | **Lecture 7. Data preparation and analysis. Descriptive and inferential statistics.**  Data coding, cleaning. Statistically adjusting data. Descriptive statistics: frequencies, percentages, means, cross-tabulation. Hypothesis testing (means and percentages). Selection of univariate statistical methods. Selection of bivariate and multivariate statistical methods. Independent and paired samples. Analysis of differences and associations.  NB! Before the start of the lecture. you must have all your data entered into an Excel table and numerically coded. | 4 |  | Hair et al., Chs. 9, 10, 11, and 12 |
| **Seminar 7.** Homework presentation and commentary.  SPSS software – data entering, data preparation for analysis, univariate data analysis.. |  | 2 |  |
|  | **Total number of contact hours** | **18** | **18** |  |

Self-study and Assessment

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| --- | --- | --- | --- |
| **Type of assignment** | **Chapters** | **Hours** | **Evaluation, %** |
| Exam | All and Lecture | 28 | 30 |
| Participation |  | 30 | 10 |
| Interim Project Parts |  | 20 | 20 |
| Research Project (Interim + Proposal) |  | 50 | 40 |
| **Total:** |  | 128 | 100 |

**EXAM (30%)**

It will cover the conceptual material from the chapters and questions relating to lecture/discussion material from class. It will be a closed-book test and will include closed and open questions. It will last 2 hours. Students must have completed all seminar participation tasks and submitted the research report on time to be allowed to take the final exam. It is the students‘ responsibility to keep track of their homework completion on time. The exam comprises 30% of the final grade and is the only part of the grade that can be substituted by a retake. Although the exam is at the end of class, students need to read the relevant chapters of the textbook BEFORE each class and could be periodically tested during the course of the semester. It is difficult if not impossible to apply the knowledge if you have not reviewed it first.

**PARTICIPATION (10%)**

This is the key part of the course that affects all the other three parts of evaluation. It is imperative for students to have done the readings and the assigned homework before each seminar and to actively participate in the seminar. Without completing all seminar participation tasks (such as homework assignments and in-class work and commentary on research projects), the student cannot be allowed to take the final exam. If the students miss a seminar, they must make up for its assignments. However, late submissions do not get points, so it may not be sufficient to get a passing grade depending on the amount of missed seminars and the lateness and quality of the make-up submissions, therefore you are strongly encouraged to do everything in your power to not miss classes and to make up for whatever you missed within the same week.

During the course students will prepare presentations on their research projects and comments on other students‘ presentations. Seminar participation scorecard will include points for presence and active participation in class exercises, The participation grade cannot be substituted with a retake.

**RESEARCH PROPOSAL AND PROJECT (60% total)**

The innovation and technology management research project in this course should be viewed as training and preparation for developing your final thesis and will focus on experience in applying the content of the course. Students must individually choose a research project to work on. The project is designed in two interim parts and a final comprehensive research proposal – as per assignments on the e-learning system.

Late submissions of research reports will not get feedback and will be given a grade of 0, and will prevent those students from taking the final exam. Papers that have plagiarism issues or misrepresent the research process and data will also be given a 0 and reported to the study commission for disciplinary measures. Those who do not manage to get a passing grade for the research project do not earn the right to take the final exam.

The interim parts proposal will be worth 20% of the final grade, and the completed and improved project will comprise 40% of the final grade. Overall, this adds up to 60%, as the research project is the most important part of this class. Its grade cannot be substituted by a retake.

**RETAKE**

The retake exam will consist of 30% of the overall grade, with the participation, completed homework assignments and project counting as 70%. The math should make it obvious that those who expect to study only before the exam cannot expect to pass the class and that timely completion of all class assignments is the only way to get a passing grade.

**ASSISTANCE**

Do not ever hesitate to request assistance with anything you do not understand.

**ELECTRONIC DEVICES**

**NO electronic devices may be used in the classroom** without prior instructor approval. Please turn off ALL cell phones and communication devices during class – this includes vibrate settings or sounds of incoming messages. Any use or potential use (having the power on) of any communication device during testing times will result in an automatic failure in this course. Other devices, including but not limited to computers, tape recorders, or mp3 players are banned, except by specific consent of instructor. Computers will be exempt only with prior instructor approval, and even if instructor approval is given, they must have all communication capability shut down (airline position) -- the wireless capabilities must be turned off.

**CLASS CONDUCT/PROFESSIONAL BEHAVIOR**

Students are expected to behave in a manner conducive to an educational setting in the classroom. Inappropriate behavior (reading magazines, newspapers, sleeping, etc.) will result in the student being asked to leave the class, which automatically negatively affects the participation grade. Multiple offenses will result in the student being asked not to come to the classroom and a failing class grade. In addition, students contacting the public (including, but not limited to, research for your project) are expected to act in a professional manner – keeping appointments, dressing appropriately for personal interviews, being respectful of others’ time, etc… Failure to abide by this can result in an immediate 0 in this class. The teaching and testing methods are chosen taking into account the purpose of the minimization of cheating opportunities. The course is based on and promotes the value of integrity. Lack of academic integrity (e.g. plagiarism, copying another person’s work, misrepresentation of your research process and results, the use of unauthorized aids on examinations, cheating, facilitating acts of academic dishonesty by others, etc.) will not be tolerated. Consequences for violations range from zero grade given for the assignments, to failure of the course, to university-level disciplinary measures for severe cases.

**DEADLINES AND DETAILS**

Meeting deadlines and taking care of details are of extreme importance in the business world. Failure to do so can result in loss of job, promotions, clients, etc. Therefore, for each assignment that is not turned in on time, a grade of “0” will be given and there will be no feedback. Elements of work that do not match the official requirements will be heavily penalized, especially if there are repeated mistakes. Students are expected to always strive to do their best.

**COMMUNICATION**

The students must use their official ISM e-mail to contact the lecturer and clearly indicate the **course name (ITM Research Methodology) and the subject matter of the question** in the subject line of the e-mail. Whenever the students have to submit their work, their names must be clearly indicated on the document and the document must be properly formatted according to ISM requirements. The file names of e-mailed documents, such as the research project, must include the **students’ last names**. It is very important that you follow these rules so your e-mails and submissions do not get lost.

REQUIRED READING

Hair, Jr., Joseph F., Wolfinbarger Celsi, Mary, Ortinau, David J., and Robert P. Bush. (2017). *Essentials of Marketing Research*. 4th edition. McGraw Hill Irwin. – You may use the 2nd or 3rd edition for this course, but lecture material will be from the 4th edition and you will need to correlate the proper topics from older editions

SUPPLEMENTARY READING

1. Aaker, David A., V. Kumar, George S. Day. 2009. *Marketing Research*. New York: Wiley.
2. Babbie, Earl. 2007. *The Practice of Social Research*. 11th ed. (Intnl. student ed.). Thomson/ Wadsworth.
3. Bryman, Alan. 2008. *Social Research Methods*. 3rd ed. Oxford University Press.
4. Churchill G.A., Iacobucci D. 2010. *Marketing research: methodological foundations*. 10th ed. South-Western, Cengage Learning.
5. Field, Andy. (2013). *Discovering Statistics Using* IBM SPSS Statistics. 4th ed. SAGE Publications.
6. Hair, Joseph F., Junior, Barry Babin, Arthur H. Money, and Phillip Samouel. 2003. *Essentials of Business Research Methods*. Wiley.
7. Malhotra N.K. 2007. *Marketing Research*. 5th ed. Pearson Education Ltd.
8. McGivern, Yvonne. 2006. *The Practice of Market and Social Research: An Introduction*. Harlow: Financial Times Prentice Hall.
9. Saunders, Mark; Lewis, Philip; Thornhill, Adrian. 2009. *Research Methods for Business Students*. 5th Ed. Pearson Education Limited.
10. Sekaran, Uma, and Roger Bougie. 2009. *Research Methods for Business: A Skill-Building Approach*. 5th ed. Wiley.
11. Tharenou, Phyllis, Ross Donohue, and Brian Cooper. 2007. *Management Research Methods*. Cambridge University Press.
12. Yin, Robert K. 2009. *Case Study Research: Design and Methods*. New Delhi: SAGE Publications.
13. Zikmund, William G., Barry J. Babin, Jon C. Carr, Mitch Griffin. 2009. *Business Research Methods*. 8th ed. South-Western College Pub.