

TERM	CREDITS (ECTS)	TYPE	MODE OF DELIVERY	LANGUAGE(S) OF INSTRUCTION
2nd	4	Elective	Face-to-face / Blended / Distance	English
MODULE		Module II: 2 <sup>nd</sup> Term		
SUBJECT		Research Methods in Management		
CENTRE / FACULTY / SCHOOL RESPONSIBLE FOR THE PROGRAMME		International School for Postgraduate Studies (EIP)		
MASTER'S DEGREE		Master in Economics		
FACULTY / SCHOOL		Facultad de Ciencias Económicas y Empresariales		
TEACHING STAFF <sup>(1)</sup>				
<b>Encarnación Álvarez Verdejo</b>				
CONTACT DETAILS		Dpto. Métodos Cuantitativos para la Economía y la Empresa, Facultad de Ciencias Económicas y Empresariales. Despacho C-108 Email address: <a href="mailto:encarniav@ugr.es">encarniav@ugr.es</a>		
OFFICE HOURS		<a href="http://metodoscuantitativos.ugr.es/pages/docencia">http://metodoscuantitativos.ugr.es/pages/docencia</a>		
<b>Juan Francisco Muñoz Rosas</b>				
CONTACT DETAILS		Métodos Cuantitativos para la Economía y la Empresa, Facultad de Ciencias Económicas y Empresariales. Despacho C-106 Email address: <a href="mailto:jfmunoz@ugr.es">jfmunoz@ugr.es</a>		
OFFICE HOURS		<a href="http://metodoscuantitativos.ugr.es/pages/docencia">http://metodoscuantitativos.ugr.es/pages/docencia</a>		
<b>Matilde Ruiz Arroyo (Coord.)</b>				
CONTACT DETAILS		Dpto. Organización de Empresas I, Facultad de Ciencias Económicas y Empresariales. Despacho B-217. Email address: <a href="mailto:matilderuiz@ugr.es">matilderuiz@ugr.es</a>		
OFFICE HOURS		<a href="https://organizacionempresas.ugr.es/docencia/profesorado">https://organizacionempresas.ugr.es/docencia/profesorado</a>		

<sup>1</sup> Consulte posible actualización en Acceso Identificado > Aplicaciones > Ordenación Docente

(∞) Esta guía docente debe ser cumplimentada siguiendo la "Normativa de Evaluación y de Calificación de los estudiantes de la Universidad de Granada" (<http://secretariageneral.ugr.es/pages/normativa/fichasugr/ncg7121/>)

## GENERAL AND SPECIFIC COMPETENCES

### BASIC AND GENERAL COMPETENCES

CB6 – To possess and understand knowledge that gives a basis or opportunity to be original in the development and/or application of ideas, often in a research context.

CB7 – That the students know how to apply the knowledge acquired and their ability to solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to their area of study.

CB8 – That the students are able to integrate knowledge and handle the complexity of formulating judgements from information that, being incomplete or limited, includes reflections on the social and ethical responsibilities linked to the application of their knowledge and judgements.

CB9 – That the students know how to communicate their conclusions and the knowledge and underlying reasons that sustain them to specialist and non-specialist audiences in a clear and unambiguous way.

CB10 – That the students possess the learning skills to enable them to continue studying in a way that will necessarily be largely self-managed and autonomous.

CG1 – That the student attain the ability for analysis and synthesis, which includes being capable of defining, distinguishing and relating both the basic concepts and the premises upon which the exposition of any argument is built, as well as stating and basing its content in a concise and critical way, in the context – scientific, political, economic, organizational or whatever the type may be – in which it is presented.

### SPECIFIC COMPETENCES

CE1 – Acquire bibliographical information on the current state of economics research

CE2 – Acquire bibliographical information on the current state of business research

CE3 – Understand the relevant existing theories, tendencies and debates

CE5 – Apply advanced techniques to real problems

CE8 – Formulate and contrast hypotheses related to theoretical assumptions and predictions

CE13 – Programme in specific software for economic studies in the laboratory

CE14 – Programme in specific software for data analysis

CE15 – Solve technical and practical problems related to the design of experimental studies

CE16 – Solve technical and practical problems related to the design of empirical studies

CE17 – Solve technical and practical problems related to the organization, presentation and analysis of the data obtained from a study

CE18 – Assist as support staff in research projects

## OBJECTIVES OR LEARNING OUTCOMES (ACCORDING TO THE MASTER'S PROGRAMME VALIDATION REPORT)

### ***Student will know/understand:***

- Understand the relevance of notational analysis as research technique in economics and management, through the use of different methods of data analysis.
- Know some research lines within notational analysis in the management field.

### ***Student will be able to:***

- Develop the empirical part of a research project based on quantitative analysis, by designing questionnaires, performing measures assessment, evaluating measures validity, assessing expert opinions, etc.
- Value the importance of surveys design and validation, sampling techniques and processes of data collection and practical implementation.



BRIEF DESCRIPTION OF THE COURSE CONTENT (ACCORDING TO THE MASTER'S PROGRAMME VALIDATION REPORT)

Design of surveys, samples and questionnaires in management research. Scales selection and composition.  
Assessment of measures. Exploratory and confirmatory factor analysis. Data analysis and model design: structural equation modeling (SEM).

SYLLABUS

THEORY SYLLABUS:

**Chapter 1. Questionnaire design for different types of surveys**

- 1.1. Response process.
- 1.2. Measuring attitudes.
- 1.3. Testing questionnaires.
- 1.4. Self-administered questionnaires.
- 1.5. Survey error.
- 1.6. Survey mode.
- 1.7. Mixed mode surveys.

**Chapter 2. Design of samples and related problems in management research**

- 2.1. Notation
- 2.2. Some sampling designs in management research.
- 2.3. Survey estimation strategy.
- 2.4. The problem of missing data in management research.
  - 2.4.1. Survey non-response: unit non-response and item non-response.
  - 2.4.2. Consequences: bias and variance.
  - 2.4.3. Non-response mechanisms: MCAR; MAR; Ignorable and Non-ignorable missingness.
  - 2.4.4. Weighting.
  - 2.4.5. Imputation: deterministic and stochastic imputation, imputation classes.

**Chapter 3. Measurement validation, PLS path modeling and model evaluation.**

- 3.1. Introduction.
- 3.2. Exploratory factor analysis.
- 3.2. Reflective and formative constructs.
- 3.2. Confirmatory factor analysis.
- 3.3. Evaluation of measurement model.
- 3.4. Building structural models.
- 3.5. Evaluation of structural model.
- 3.6. Moderation and mediation.

PRACTICAL SYLLABUS:

The practical syllabus is integrated in the theory syllabus

LABORATORY SESSIONS:

Not applicable

FIELDWORK:

Not applicable



## REQUIRED AND RECOMMENDED READING

### REQUIRED READING:

Cochran, W.G. (1977). *Sampling Techniques*. 3rd ed. New York: Wiley.

Field, A. (2013). *Discovering Statistics Using IBM SPSS Statistics*. 4th edition. SAGE Publications.

Hair, J.F., Hult, G.T.M., Ringle, C.M., & Sarstedt, M. (2014). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. SAGE Publications.

Hedayat, A.S., Sinha, B.K. (1991) *Design and Inference in Finite Population Sampling*. John Wiley and Sons.

Henseler, J., Dijkstra, T. K., Sarstedt, M., Ringle, C. M., Diamantopoulos, A., Straub, D. W., Ketchen, D. J., Hair, J. F., Hult, G. T. M., and Calantone, R. J. (2014). Common Beliefs and Reality about Partial Least Squares: Comments on Rönkkö & Evermann (2013), *Organizational Research Methods*, 17(2), 182-209.

Hu, M., Salvucci, S. Lee, R. (2001). *A Study of Imputation Algorithms*. Working Paper No. 2001-17. Washington DC: U.S. Department of Education, National Center for Education Statistics, 2001. 27 Stata Statistical Software.

Kalton, G., Kasprzyk, D. (1986). The treatment of missing survey data. *Survey Methodology*, 1-16.

Liñán, F., & Chen, Y. (2009). Development and cross-cultural application of a specific instrument to measure entrepreneurial intentions. *Entrepreneurship Theory and Practice*, 33(3), 593-617.

Little, R.J.A., Rubin, D.B. (2002). *Statistical analysis with missing data*. 2nd edition. New York: John Wiley & Sons, Inc.

Särndal, C.E., Swensson, B., Wretman, J.H. (1992). *Model Assisted Survey Sampling*. Springer-Verlag, New York.

### RECOMMENDED READING:

Aguinis, H., Edwards, J. R., & Bradley, K. J. (2016). Improving our understanding of moderation and mediation in strategic management research, *Organizational Research Methods*, 20(4), 665-685.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173-1182.

Babin, B. J., Lee, Y. K., Kim, E. J., & Griffin, M. (2005). Modeling consumer satisfaction and word-of-mouth: Restaurant patronage in Korea. *Journal of Services Marketing*, 19(3), 133-

Beatty, P. (1995). Understanding the Standardized/Non-Standardized Interviewing Controversy, *Journal of Official Statistics*, 11, 147-160.

Bello, A.L. (1993). Choosing among imputation techniques for incomplete multivariate data: a simulation study. *Communication in Statistics*, 22 823-877.

Berger, Y.G., Rao, J.N.K. (2006). Adjusted jackknife for imputation under unequal probability sampling without replacement. *Journal of the Royal Statistical Society, Series B*, 68 531-547.

Brick, J.M., Kalton, G. (1996). Handling missing data in survey research. *Statistical Methods in Medical Research*, 5 215-238.



- Chaudhuri, A., Vos, J.W.E. (1988) Unified theory and strategies of survey sampling.} North- Holland, Amsterdam.
- Chen, J., Shao, J. (2000). Nearest neighbor imputation for survey data. *Journal of Official Statistics*, 16 113--131.
- Chin, W.W. (1998). Issues and Opinion on Structural Equation Modeling, *MIS Quarterly*, Vol. 22(1), 7-16.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Mahwah, NJ: Lawrence Erlbaum.
- Cohen, M.P. (1996). A new approach to imputation. *American Statistical Association Proceeding of the Section on Survey Research Methods* 293--298.
- Costello, A.B., & Osborne, J.W. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research and Evaluation*, 10(7), 1-9.
- Couper, M. P. (2011). The future of modes of data collection. *Public Opinion Quarterly*, 75(5), 889-908. Available at <http://poq.oxfordjournals.org/content/75/5/889.full>.
- De Leeuw, D. (2005). To mix or not to mix data collection modes in surveys. *Journal of official statistics*, 21(2), 233. Available at <http://www.jos.nu/Articles/abstract.asp?article=212233>
- Hair, J.F., Black, W.C., Babin, B., & Anderson, R.E. (2010). *Multivariate Data Analysis*. 7th edition. Pearson.
- Hansen, M.H., Hurwitz, W.N. (1943) On the theory of sampling from finite populations. *Annals of Mathematical Statistics* 14, 333-362.
- Hartline, M. D., & Ferrell, O. C. (1996). The management of customer-contact service employees: An empirical investigation. *Journal of Marketing*, 60(4), 52-70.
- Healy, M.J.R., Westmacott, M. (1956). Missing values in experments analysed on automatic computers. *Applied Statistics*, 5 203--206.
- Hunter, J. and DeMaio, T. (2003). Results & Recommendations from the Cognitive Pretesting of the 2003 Public School Questionnaire from the Schools and Staffing Survey (example on how a report can be written).
- Kalton, G. (1983). *Compensating for missing data*. Ann Arbor: Institute for Social Research, University of Michigan.
- Keeter, S., Kennedy, C., Dimock, M., Best, J., & Craighill, P. (2006). Gauging the impact of growing nonresponse on estimates from a national RDD telephone survey. *Public Opinion Quarterly*, 70(5), 759-779. Available at: <https://poq.oxfordjournals.org/content/70/5/759.full>
- Kreuter, F., Presser, S., and Tourangeau, R. (2008). Social Desirability Bias in CATI, IVR, and Web Surveys: The Effects of Mode and Question Sensitivity, *Public Opinion Quarterly*, 72, 847-865.
- Mukhopadhyay, P. (2000). *Topics in Survey Sampling*. Springer.
- Murthy, M.N. (1967). *Sampling theory and method*. Calcutta: Statistical Publishing Society.
- Oksenberg, L., Cannell, C., and Kalton, G. (1991). New Strategies for Pretesting Survey Questions, *Journal of Official Statistics*, 7, 349-365.
- Rancourt, E., Lee, H., Särndal, C.E. (1994). Bias correction for survey estimates from data with ratio imputed values for confounded nonresponse. *Survey Methodology*, 20 137--147.

- Rao, J.N.K. (1996). On variance estimation with imputed survey data (with discussion). *Journal of the American Statistical Association*, 91 499–520.
- Rao, J.N.K., Shao, J. (1992). Jackknife Variance Estimation With Survey Data Under Hot-Deck Imputation. *Biometrika*, 79 811–822.
- Rubin, D.B. (1978). Multiple imputations in sample surveys. A phenomenological bayesian approach to nonresponse. *Proceedings of the Survey Research Methods Section, American Statistical Association*. 20–34.
- Rubin, D.B. (1987) *Multiple imputation for nonresponse in sample surveys*. Wiley, New York.
- Rubin, D.B. (1996). Multiple imputation after 18+ years. *Journal of the American Statistical Association*, 91 473–489.
- Schnell, R. and F. Kreuter. (2005). Separating Interviewer and Sampling-Point Effects. *Journal of Official Statistics*, 21, 389-410.
- Sedransk, J. (1985). The objective and practice of imputation. *Proc. First Annual Res. Conf. Washington, D.C.: Bureau of the Census*. 445–452.
- Singh, S. (2003) *Advanced sampling theory with applications: How Michael Selected Amy.*, Kluwer Academic Publishers, The Netherlands.
- Tanur, J., and R. Tourangeau, *Cognitive Aspects of Survey Methodology: Building a Bridge Between Disciplines*, Washington DC: National Academy Pr.
- Tourangeau, R. (1984). *Cognitive Sciences and Survey Methods*. pp. 73-100 in Jabine, T., Straf, M.
- Tourangeau, R., Rasinski, K., Jobe, J., Smith, T.W., and Pratt, W.F. (1997). Sources of Error in a Survey on Sexual Behavior. *Journal of Official Statistics*, 12, 341-365.
- Valliant, R., Dorfman, A.H., Royall, R.M. (2000) *Finite population sampling and inference: A prediction approach*. Wiley Series in Probability and Statistics, Survey Methodology Section. New York. John Wiley and Sons, Inc.
- Wetzels, M., Odekerken-Schroder, G., & van Oppen, C. (2009). Using PLS path modeling for assessing hierarchical construct models: Guidelines and empirical illustration. *MIS Quarterly*, 33(1), 177-195.
- Wolter, K.M. (2007) *Introduction to Variance Estimation*. Second Edition. Springer.

#### USEFUL LINKS (OPTIONAL)

- <https://www.smartpls.com/>
- <http://forum.smartpls.com/viewtopic.php?f=5&t=14062>
- <https://www.bls.gov>
- <http://ec.europa.eu/eurostat/web/main/home>
- <http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home>
- <http://ine.es>
- <http://www.juntadeandalucia.es/institutodeestadisticaycartografia/>
- <http://metodoscuantitativos.ugr.es/>
- <http://www.bde.es/webbde/es/>
- <http://www.bolsamadrid.es/homei.htm>
- <http://www.anuario.co.lacaixa.comunicacions.com>
- <http://descargar.portalprogramas.com/gretl.html>



<http://gretl.softonic.com/>  
<https://www.r-project.org/>  
<https://www.rstudio.com/products/rstudio/download/>

## TEACHING METHODOLOGY

### Teaching methodology:

1. Master lessons.
2. Troubleshooting and case studies.
3. Assessing and supporting students' work in class.

### Training activities:

1. Theoretical lessons.
2. Practical lessons, including exercises and/or reading and debate of selected papers.
3. Autonomous work of the student.

## ASSESSMENT (EVALUATION INSTRUMENTS, EVALUATION CRITERIA, PERCENTAGE OF FINAL MARK, ETC)

### ORDINARY ASSESSMENT SESSION

Article 17 of the UGR Assessment Policy and Regulations establishes that the ordinary assessment session (*convocatoria ordinaria*) will preferably be based on the continuous assessment of students, except for those who have been granted the right to a single final assessment (*evaluación única final*), which is an assessment method that only takes a final exam into account.

In the continuous assessment system, there will be diverse assessment tools, conducted mostly on an ongoing evaluation of the following aspects of the student's training. The assessment will comprise (the weight of each item in the final assessment is shown in parentheses):

- Sessions' attendance and active participation (% of attendance \* participation mark) (15%)
  - Class attending is measured as the percentage of attended sessions within total sessions. Seminars' attending specific to this subject is compulsory (if applicable).
  - Active participation is measured with exercises' presentation and answers to quizzes during the lessons. Among other evidences, the teacher may rely on Kahoot application to measure class attending and responses to quizzes (<https://getkahoot.com/how-it-works>).
- Exercises development and resolution individually or in teams (25%)
- Works and projects developed individually or in teams (10%)
- Written test based on theoretical and/or practical contents (50%). There will be a test in 3 parts, corresponding to every chapter and weighted according to the hours devoted to each of them. It is necessary a minimum mark of 4 (out of 10) in every part to assess the weighted sum (or test global mark).

### EXTRAORDINARY ASSESSMENT SESSION

Article 19 of the UGR Assessment Policy and Regulations establishes that students who have not passed a course in the ordinary assessment session (*convocatoria ordinaria*) will have access to an extraordinary assessment session (*convocatoria extraordinaria*). All students may take part in this extraordinary assessment session, regardless of whether or not they have followed continuous assessment activities. In this way, students who have not carried out continuous assessment activities will have the opportunity to obtain 100% of their mark by means of an exam and/or assignment.

Students who failed or do not perform the assessment in the first call (ongoing evaluation or single final assessment) may take a special exam.





Extraordinary assessment session will take place in September 2021. Date and room for the extraordinary assessment session will be fixed at least 15 days in advance and will be communicated in PRADO.

The assessment will comprise:

- Test with 15-20 objective questions referred to the theoretical content (50%)
- Test with several practical questions (50%)

#### DATES OF EVALUATION

**Ordinary assessment session:** Date of the evaluation will be fixed no longer than 2 weeks after the end of the lecture period and, at least 15 days before the exam.

**Extraordinary assessment session:** Date of the evaluation will be fixed within the periods 1<sup>st</sup> – 31<sup>st</sup> July or 1<sup>st</sup> – 25<sup>th</sup> September 2021, and communicated at least 15 days before the exam.

#### DESCRIPTION OF THE EXAMS/TESTS THAT WILL FORM PART OF THE SINGLE FINAL ASSESSMENT “EVALUACIÓN ÚNICA FINAL” (AN ASSESSMENT METHOD THAT ONLY TAKES A FINAL EXAM INTO ACCOUNT) AS ESTABLISHED IN THE UGR ASSESSMENT POLICY AND REGULATIONS)

Article 8 of the UGR Assessment Policy and Regulations establishes that students who are unable to follow continuous assessment methods due to justifiable reasons shall have recourse to a single final assessment (*evaluación única final*), which is an assessment method that only takes a final exam into account.

In order to opt for a single final assessment (*evaluación única final*), students must send a request, using the corresponding online procedure (<https://sede.ugr.es/procs/Gestion-Academica-Solicitud-de-evaluacion-unica-final/>), to the coordinator of the master’s programme, in the first two weeks of the course or in the two weeks following their enrolment (if the enrolment has taken place after the classes have already begun). The coordinator will communicate this information to the relevant teaching staff members, citing and verifying the reasons why the student is unable to follow the continuous assessment system.

For **students authorized** to do a single final assessment, the assessment will comprise:

- Test with 15-20 objective questions referred to the theoretical content (50%)
- Test, exercises and/or problems to be solved individually and handed-in to the professors (50%)

### SCENARIO A (ON-CAMPUS AND REMOTE TEACHING AND LEARNING COMBINED)

#### TUTORIALS

##### TIMETABLE (According to Official Academic Organization Plan)

##### TOOLS FOR TUTORIALS (Indicate which digital tools will be used for tutorials)

Prof. Encarnación Álvarez Verdejo  
<http://metodoscuantitativos.ugr.es/pages/docencia>  
 Prof. Juan Francisco Muñoz Rosas  
<http://metodoscuantitativos.ugr.es/pages/docencia>  
 Prof. Matilde Ruiz Arroyo (Coord.)  
<https://organizacionempresas.ugr.es/docencia/profesorado>

Tutorial hours will be developed on-campus if the competent authority allows so.

In case of remote tutorials, please contact by e-mail to set an appointment for tutorials in Google Meet (or any other platform established by UGR):  
 Encarnación Álvarez Verdejo: [encarniav@ugr.es](mailto:encarniav@ugr.es)  
 Juan Francisco Muñoz Rosas: [jfmunoz@go.ugr.es](mailto:jfmunoz@go.ugr.es)  
 Matilde Ruiz Arroyo: [matilderuiz@ugr.es](mailto:matilderuiz@ugr.es)





#### MEASURES TAKEN TO ADAPT TEACHING METHODOLOGY

When security distance can be kept, and if the competent authority allows so, sessions will be developed in on-campus mode.

In case of a remote scenario, teaching methodology is suitable to be fully adapted and applied, by using the on-line tools established by the University of Granada (e.g., PRADO, Google Meet...).

#### MEASURES TAKEN TO ADAPT ASSESSMENT (Instruments, criteria and percentage of final overall mark)

##### Ordinary assessment session

When security distance can be kept, and if the competent authority allows so, assessment sessions will be developed on-site in the room, with the same assessment distribution explained above.

In case of a remote scenario sessions will be developed online, with the same assessment distribution explained above, but adapted to on-line mode:

- On-line sessions' attendance and active participation (% of attendance \* participation mark) (15%)
- Exercises development and resolution individually or in teams, to be sent by PRADO (25%)
- Works and projects developed individually or in teams, to be sent by PRADO (10%)
- On-line test based on theoretical and/or practical contents (in PRADO) (50%). There will be a test in 3 parts, corresponding to every chapter and weighted according to the hours devoted to each of them. It is necessary a minimum mark of 4 (out of 10) in every part to assess the weighted sum (or test global mark).

##### Extraordinary assessment session

When security distance can be kept, and if the competent authority allows so, assessment sessions will be developed on-site in the room, with the same assessment distribution explained above.

In case of a remote scenario sessions will be developed online, with the same assessment distribution explained above, but adapted to on-line mode:

- On-line theoretical test (in PRADO) with 15-20 objective questions referred to the theoretical content (50%).
- On-line practical test (in PRADO) with several practical questions in which apply the knowledge acquired (50%)

##### Single final assessment

When security distance can be kept, and if the competent authority allows so, assessment sessions will be developed on-site in the room, with the same assessment distribution explained above.

In case of a remote scenario sessions will be developed online, with the same assessment distribution explained above, but adapted to on-line mode:

- On-line theoretical test (in PRADO) with 15-20 objective questions referred to the theoretical content (50%).
- On-line test, exercises and/or problems to be solved individually and sent to the professors (50%)



## SCENARIO B (ONCAMPUS ACTIVITY SUSPENDED)

TIMETABLE (According to Official Academic Organization Plan)	TOOLS FOR TUTORIALS (Indicate which digital tools will be used for tutorials)
Prof. Encarnación Álvarez Verdejo <a href="http://metodoscuantitativos.ugr.es/pages/docencia">http://metodoscuantitativos.ugr.es/pages/docencia</a> Prof. Juan Francisco Muñoz Rosas <a href="http://metodoscuantitativos.ugr.es/pages/docencia">http://metodoscuantitativos.ugr.es/pages/docencia</a> Prof. Matilde Ruiz Arroyo (Coord.) <a href="https://organizacionempresas.ugr.es/docencia/profesorado">https://organizacionempresas.ugr.es/docencia/profesorado</a>	In case of remote tutorials, please contact by e-mail to set an appointment for tutorials in Google Meet (or any other platform established by UGR): Encarnación Álvarez Verdejo: <a href="mailto:encarniav@ugr.es">encarniav@ugr.es</a> Juan Francisco Muñoz Rosas: <a href="mailto:jfmunoz@go.ugr.es">jfmunoz@go.ugr.es</a> Matilde Ruiz Arroyo: <a href="mailto:matilderuiz@ugr.es">matilderuiz@ugr.es</a>
MEASURES TAKEN TO ADAPT TEACHING METHODOLOGY	
In case of a remote scenario, teaching methodology is suitable to be fully adapted and applied, by using the on-line tools established by the University of Granada (e.g., PRADO, Google Meet...).	
MEASURES TAKEN TO ADAPT ASSESSMENT (Instruments, criteria and percentage of final overall mark)	
<b>Ordinary assessment session</b>	
In case of a remote scenario sessions will be developed online, with the same assessment distribution explained above, but adapted to on-line mode: <ul style="list-style-type: none"> <li>• On-line sessions' attendance and active participation (% of attendance * participation mark) (15%)</li> <li>• Exercises development and resolution individually or in teams, to be sent by PRADO (25%)</li> <li>• Works and projects developed individually or in teams, to be sent by PRADO (10%)</li> <li>• On-line test based on theoretical and/or practical contents (in PRADO) (50%). There will be a test in 3 parts, corresponding to every chapter and weighted according to the hours devoted to each of them. It is necessary a minimum mark of 4 (out of 10) in every part to assess the weighted sum (or test global mark).</li> </ul>	
<b>Extraordinary assessment session</b>	
In case of a remote scenario sessions will be developed online, with the same assessment distribution explained above, but adapted to on-line mode: <ul style="list-style-type: none"> <li>• On-line theoretical test (in PRADO) with 15-20 objective questions referred to the theoretical content of the subject (50%).</li> <li>• On-line practical test (in PRADO) with several practical questions in which apply the knowledge acquired (50%)</li> </ul>	
<b>Single final assessment</b>	
In case of a remote scenario sessions will be developed online, with the same assessment distribution explained above, but adapted to on-line mode: <ul style="list-style-type: none"> <li>• On-line theoretical test (in PRADO) with 15-20 objective questions referred to the theoretical content (50%).</li> <li>• On-line test, exercises and/or problems to be solved individually and sent to the professors (50%)</li> </ul>	

