



MACKENZIE PRESBYTERIAN UNIVERSITY
Social and Applied Sciences Centre
Graduate Program in Business Management

TEACHING PLAN

Graduate Program: Business Management		
Course: ☒ Academic Master's ☐ Professional Master's ☒ Doctorate		
Discipline: Structural Equation Modeling		Discipline code: ENST55117
Professor: Diógenes de Souza Bido		DRT: 1123289
Workload: 32h	Credits: 2	☐ Mandatory ☒ Elective
This course is recommended for those who have already taken a course in Quantitative Methods or Econometrics, as it requires knowledge of standard deviation, standardized variables, covariance, correlation, regression, hypothesis tests, and significance level. Consult your advisor before enrolling. Syllabus: • PLS-SEM (partial least squares – structural equation modeling) • Exploratory analysis vs. confirmatory analysis • Measurement model: nature of the construct, form of measurement, and estimation method • Structural model as a general case of regression and path analysis • Mediation: direct, indirect, and total effects. • Models with control variables: numerical, dummy, and categorical • Common method bias control (measured latent variable and method marker) • Advanced topics: PLSpredict, second-order latent variable, importance-performance map, moderation with numerical and categorical variables (multigroup analysis). • CB-SEM (covariance-based – structural equation modeling) • Path analysis and confirmatory factor analysis • Degrees of freedom and Goodness of fit • Structural model and mediation Learning objectives Empower participants to: (i) Identify situations in which structural equation modeling is the most recommended method; (ii) Use structural equation modeling in their research; (iii) Evaluate the measurement and structural model; and (iv) Sensitize them to the need for rigor in their analysis. . Assessment Criteria: • 60% Weekly exercises • 40% Final report		



Bibliography:

- Bido, D. S. & Silva, D. (2019). SmartPLS 3: specification, estimation, evaluation and reporting. *RAEP - Administração: Ensino e Pesquisa*, 20(2), p. 488–536, 2019. [PT and EN]
<https://raep.emnuvens.com.br/raep/article/view/1545>
- Bido, D. S. (2019). Modelagem de equações estruturais: uma visão aplicada para a engenharia. In: Cauchick-Miguel, P. A. (org.). *Metodologia Científica para Engenharia*. 1ª Ed. São Paulo: Editora GEN-LTC. Cap.4 (p.81-108).
- Bido, D. S., & Souza, C. A. (2026). Structural Equation Modeling: Is it still worth learning?. *BAR-Brazilian Administration Review*, 23(3), e260020. <https://doi.org/10.1590/1807-7692bar2026260020>
- Bido, D. S., Mantovani, D. M. N., & Cohen, E. D. (2018). Destruction of measurement scale through exploratory factor analysis in production and operations research. *Gestão & Produção*, 25(2), p. 384-397. [PT and EN] <http://dx.doi.org/10.1590/0104-530X3391-16>
- Chin, W. W., Thatcher, J. B., Wright, R. T., & Steel, D. Controlling for common method variance in PLS analysis: the measured latent marker variable approach. In: Abdi, H., Chin, W. W., Vinzi, V. E., Russolillo, G., & Trinchera, L. (Ed.). *New Perspectives in Partial Least Squares and Related Methods*. New York: Springer, 2013. p.231-239.
- Hair Jr., J. F. et al. (2021). *Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R: a workbook*. Springer. Open access at: <https://link.springer.com/content/pdf/10.1007/978-3-030-80519-7.pdf>
- Hair Jr., J. F., Babin, B. J., Ringle, C. M. et al. (2025). Covariance-based structural equation modeling (CB-SEM): a SmartPLS 4 software tutorial. *Journal of Marketing Analytics*, 13, 709–724.
<https://doi.org/10.1057/s41270-025-00414-6>
- Hair Jr., J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. 3rd Ed. Thousand Oaks, CA: Sage.
- Hair Jr., J. F., Sarstedt, M., Ringle, C. M., & Gudergan, S. P. (2024). *Advanced Issues in Partial Least Squares Structural Equation Modeling (PLS-SEM)*. 2nd Ed. Thousand Oaks, CA: Sage.
- Henseler, J. (2021). *Composite-Based Structural Equation Modeling: Analyzing latent and emergent variables*. New York: The Guilford Press. [Companion: <https://www.guilford.com/henseler-materials>].
- Kline, R. B. (2023). *Principles and Practice of Structural Equation Modeling*. 5th Ed. New York: The Guilford Press.
- Kock, N. (2018). Should bootstrapping be used in PLS-SEM? Toward stable p-value calculation methods. *Journal of Applied Structural Equation Modeling*: 1(2), 1-12. [http://dx.doi.org/10.47263/JASEM.2\(1\)02](http://dx.doi.org/10.47263/JASEM.2(1)02)
- Rosseel, Y. (2026). *lavaan tutorial*. <https://lavaan.ugent.be/tutorial/index.html>
- Shmueli, G., Sarstedt, M., Hair, J. F., Cheah, J. H., Ting, H., Vaithilingam, S., & Ringle, C. M. (2019). Predictive model assessment in PLS-SEM: Guidelines for using PLSpredict. *European Journal of Marketing*, 53(11), 2322–2347. <https://doi.org/10.1108/EJM-02-2019-0189>