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In this engaging course, students will not only master advanced skills in quantitative research but also immerse themselves in the dynamic world of statistical analysis software, including SPSS, AMOS, Smart-PLS, and more. Through exciting mid-term and final sharing sessions, each student will gain profound insights into the realms of agricultural economics, finance, business management, marketing, and animal husbandry, exploring real-world applications that bring theories to life.

outline:

Topics in this course include an introduction to the basic concepts of linear structure, explanation of model fit indicators, path analysis, confirmatory factor analysis, shoe-pull procedure and model validity verification. Additionally, there is a discussion of various intermediary and interference models and their mixed models, group comparison of group models, and a discussion of Bayesian analysis, all utilized as practical exercises through the application of SPSS, AMOS, and Smart PLS. Cross-level research topics are derived from nested data structures and theoretical models to the setting of hierarchical linear models (HLM) and context models, and the application of longitudinal research development and related research topics are discussed to achieve the teaching objectives of this course, helping students understand the concepts and practical applications of advanced quantitative research methods in recent years.

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The main purpose of this course is to help students understand and be able to construct structural equation models and multi-level models for their research. Additionally, the course aims to enhance comprehension of practical applications related to these models, enabling learners to understand and review research papers in the field. The teaching goals will be accomplished through the clarification of theoretical concepts, practical applications, and relevant issues. - The theory and application of linear structure (Path Analysis & Regression Analysis) - Mediation model and effect (Similarities & Moderation Analysis / Path model) - Multiple Mediation model and effect (Multiple Mediation / Various mediation models) - Parallel mediation & Sequential mediation - Moderation Model and Effect - Introduction to Confirmatory Factor Analysis (EFA & CFA) - Understand and be able to critique published SEM articles and research - Conduct their SEM analysis with confidence - Formulate, evaluate, and specify SEM model

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A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM) Introduction to Statistical Mediation Analysis Introduction to Mediation, Moderation, and Conditional Process Analysis Structural Equation Modeling With AMOS Partial Least Squares: Regression and Structural Equation Models

		( )	
1	2.19~2.25	Add/Drop Week Class introduction, Grading system and software installation	19 19~23 ( ) 23
2	2.26~3.03	SPSS Software interface and working environment	28 ( )
3	3.04~3.10	The theory and application of linear structure 1.An introduction to Structural Equation Modeling 2.Differences Between Path Analysis and Regression Analysis	
4	3.11~3.17	The theory and application of linear structure 1.CB-SEM versus PLS-SEM (VB-SEM) 2.Difference between the formative and reflective indicators	11 ,14 1
5	3.18~3.24	AMOS interface and working environment 1.Regression, interaction, and path analysis 2.Model-identification and verification of causality	
6	3.25~3.31	Mediation model and effect 1.Understand the similarities and differences between mediation and moderation analysis 2.Path model estimation	
7	4.01~4.07	Multiple Mediation model and effect 1.Multiple Mediation effect verification 2.Discussion of various mediation models	3 ( ) (112 11 2 5( )) 4 ( ) ( ) 5 ( )
8	4.08~4.14	Parallel mediation & Sequential mediation Bayesian Estimand, custom Estimand	10 11 2
9	4.15~4.21	Midterm Personal Exercise & Homework Reports	15~21
10	4.22~4.28	Moderation Model and Effect Case Study and Paper Reading	22~26 ,27~ 28 , 28
11	4.29~5.05	Mixed Model analysis and Multi-groups Comparison	
12	5.06~5.12	Introduction to Confirmatory Factor Analysis 1.The similarities and differences between EFA and CFA 2.Second-order CFA	11 ( )
13	5.13~5.19	Identification, verification, and evaluation of models 1.Overall model fit assessment 2.Evaluation of measurement model	16 3 19 ( )

		3.Evaluation of structural model	
14	5.20~5.26	SmartPLS (1) Software interface and working environment	20 ~24　　　　　　　　　　22 　　　　(　　),24
15	5.27~6.02	SmartPLS (1) Software interface and working environment Mediation Model and its extended application	27~ 31
16	6.03~6.09	SmartPLS (2) Moderation Model and its extended Application	3　　　　　　　　3~9　　　　　　(　)
17	6.10~6.16	SmartPLS (3) Mixed Model Analysis & Case Study and Paper Reading	10　　　　(　　)　12
18	6.17~6.23	Final Personal Exercise & Homework Reports	17~23