Structural Equation Modeling (SEM) with AMOS/R/Python Training Course

Professional Development Training Course Outline

Category	Research and Data Analysis	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Structural Equation Modeling (SEM) is a powerful statistical technique widely used in research and analytics to model complex relationships among observed and latent variables. Structural Equation Modeling (SEM) with AMOS/R/Python Training Course is designed to equip participants with in-depth knowledge and practical skills in SEM using AMOS, R (lavaan, semPlot), and Python (semopy, statsmodels). Learners will gain expertise in advanced statistical modeling, multivariate analysis, confirmatory factor analysis, model fit evaluation, and more—making them industry-ready professionals in the field of data science and quantitative research.

With the rise of data-driven decision-making, the demand for skilled professionals in SEM has surged across industries including academia, healthcare, social sciences, marketing, and finance. This course merges theoretical foundations with real-world application through software-based modeling, syntax-based scripting, and case studies. Learners will master model specification, identification, estimation, evaluation, and modification while gaining the ability to translate raw data into actionable insights.

Programme Curriculum

Structural Equation Modeling (SEM) with AMOS/R/Python Training Course

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Course Objectives

1. Understand the fundamentals of Structural Equation Modeling (SEM)
2. Master Confirmatory Factor Analysis (CFA) and path modeling
3. Apply SEM techniques using AMOS, R, and Python
4. Interpret model fit indices: CFI, RMSEA, SRMR, Chi-square
5. Analyze latent variables and measurement models
6. Conduct model identification and estimation
7. Modify and respecify models for improved model fit
8. Visualize SEM using semPlot and AMOS path diagrams
9. Use Python's semopy for scripting SEM models
10. Evaluate mediating and moderating effects in SEM
11. Handle missing data and perform data imputation
12. Generate publication-ready results and visualizations
13. Apply SEM in real-world research and business cases

Target Audience

1. Researchers in social sciences, psychology, or education
2. Data scientists and quantitative analysts
3. Academicians and Ph.D. candidates
4. Business analysts working with behavioral data
5. Healthcare and epidemiology professionals
6. Statistical consultants and research officers
7. Graduate students in statistics, data science, or econometrics
8. Machine learning practitioners using complex models

Course Duration: 5 days

Course Modules

Module 1: Introduction to SEM

- Overview of SEM concepts
- Understanding measurement and structural models
- Key assumptions and requirements
- Differences between SEM and regression
- Benefits of SEM in research
- **Case Study:** SEM in customer satisfaction analysis

Module 2: Measurement Model & Confirmatory Factor Analysis (CFA)

- Latent variables and observed indicators
- Model identification and CFA syntax
- Goodness-of-fit statistics in CFA
- Construct reliability and validity
- Software comparison: AMOS vs R
- **Case Study:** CFA for educational testing scales

Module 3: Structural Model Development

- Specifying structural relationships
- Mediation and moderation in SEM
- Direct and indirect effects
- Hypothesis testing within SEM
- Sample size considerations
- **Case Study:** SEM on job satisfaction and performance

Module 4: SEM with AMOS

- Navigating AMOS interface
- Drawing path diagrams
- Model estimation in AMOS
- Generating output and interpretation
- Exporting visualizations
- **Case Study:** AMOS-based model for healthcare service delivery

Module 5: SEM using R (lavaan & semPlot)

- Installing and using lavaan package
- Syntax-driven model building
- semPlot for graphical representation
- Fit measures in R
- Reporting results in APA style
- **Case Study:** SEM for consumer behavior analysis

Module 6: SEM using Python (semopy)

- Introduction to semopy and pandas integration
- Model definition using Python scripts
- Model diagnostics and error handling
- Visualization with networkx and semopy
- Saving and exporting models
- **Case Study:** Python SEM for HR retention modeling

Module 7: Model Fit, Diagnostics, and Modification

- Absolute and incremental fit indices
- Understanding residuals and modification indices
- Handling model misspecification
- Respecifying and re-estimating models
- Evaluating nested models
- **Case Study:** Model fit evaluation in medical research

Module 8: Advanced Applications and Reporting

- Multi-group SEM and invariance testing
- Longitudinal SEM techniques
- Handling missing data
- Writing and publishing SEM studies
- Ethical considerations in SEM
- **Case Study:** Multi-group SEM for cross-cultural studies

Training Methodology

- Interactive instructor-led sessions via Zoom/Teams

- Live software demonstrations (AMOS, R, Python)
- Hands-on modeling exercises with real datasets
- Downloadable SEM templates and scripts
- Group discussions and Q&A after each module
- Evaluation through mini-projects and case study analysis

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

Ready to enroll or request a customized program? Book online or contact us:

Register Online Now

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