



**FACULTY DEVELOPMENT CENTRE  
(HUMAN RESOURCE DEVELOPMENT CENTRE)  
GURU NANAK DEV UNIVERSITY, AMRITSAR**



Workshop on Scale Development, Refinement and  
Construction of Causal Model - An Application of SEM using  
Variance and Co-Variance Techniques

(November 04 – November 10, 2019)

**UNDER THE PATRONAGE OF  
THE VICE-CHANCELLOR**

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*Organized By*  
**FACULTY DEVELOPMENT CENTRE, GNDU, AMRITSAR**

## About the Workshop

This workshop is an effort to enrich the researchers in various areas of social sciences with the latest techniques of data analytics and business modelling by using the advanced models (Covariance Based Structural Model and Variance Based Structural Model).

Specifically, the objective of the workshop is to apprise the researchers about usage of the latest softwares by using SmartPLS, and R for the purpose of:

1. Scale Development and refinement by adopting various reliability and validity measures.
2. Building and Constructing Research objectives based upon theoretical content and finally constructing a hypothetical model which reveals the causal nature of the research problem.
3. Building up of reflective and formative constructs in order to ensure their reliability and validity measures and finally formulating a structural design.
4. To enable the participants to understand the intricacies and scope of Co-variance Based SEM (CB-SEM); this will include the conceptual understanding of Exploratory Factor Analysis and to apply Confirmatory Factor Analysis.
5. To enrich the participants with the advanced CFA including both First and Second Order Confirmatory Models.
6. To make the participants well versed with direct and indirect effects pertaining to endogenous and exogenous variables and finally explaining them in the form of structural equation model which will focus upon the development of path model.
7. To explain higher order effects in SEM which will include mediation and moderation effects giving full coverage to categorical and interaction moderations.
8. Explaining various limitations of applying Co-variance Based SEM and then understanding the usefulness/application of Variance-Based SEM (VB-SEM) using SmartPLS. This will also cover all the aspects of Path Modelling.
9. To explain all the validity measures (Convergent and Discriminant), hypothesis testing by the means of bootstrapping process and then explaining Multi-Group Analysis and Mediation.
10. To enable the participants with the process of data cleaning by removing multivariate outliers with the help of Mahabalonis Test for Outliers in SEM.
11. To address the issues related to observed/unobserved heterogeneity using Finite Mixtures (FIMIX) and Prediction Oriented Segmentation (POS) technique.
12. Finally, discussion of a Case Study as an application of SEM with the help of Technology Acceptance Model (TAM).

## Registration Procedure:

There is no registration fee for participation in the Workshop. For online submission of Application Form & further details, please visit our website: [www.hrdcgndu.org](http://www.hrdcgndu.org). For any registration related queries contact at 0183-2258802-09 Ext. 3178 (9am- 5pm, Mon-Fri)

## Duration

The Workshop is scheduled from **November 4 to November 10, 2019**. Duration of the Sessions will be from **10:00 am to 4:00 pm** each day and all the participants must report at **9:00 am** for registration on the first day and for the attendance on subsequent days. There shall be a tea break from 11:30 am to 12:00 pm followed by a lunch break from 1:30 pm to 2:30 pm. It is mandatory to attend all the sessions during the Workshop.

## Target Group

Applications are invited from faculty members and Ph.D Scholars of Universities/ Colleges/Institutes of Higher Education and Eminence of National and International level to enroll for the Course.

## Accommodation and Travel Allowances:

Free Boarding and Lodging will be provided to the participants during the Workshop. Accommodation will be provided in University Guest House on sharing basis.

## Contact Us:

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## *Session Schedule*

Date	Session-I		Session-II		Session-III
	<b>10:00 – 11:30</b>		<b>12:00 – 1:30</b>		<b>2:30 – 4:00</b>
<b>04-11-2019 (MON)</b>	Inauguration and Induction of Participants	<b>T E A C H E R E A K</b>	Introduction to Scaling & its types.	<b>L U N C H</b>	Scale Development and Refinement.
<b>05-11-2019 (TUE)</b>	Building and Constructing Research Objectives and Hypothesis. Building		Application of Exploratory Factor Analysis. Reflective and Formative Scales.		Conceptual understanding of Confirmatory Factor Analysis, Some reflections on Exploratory Factor Analysis and CFA, Key concepts of CFA.
<b>06-11-2019 (WED)</b>	Reliability and validity issues concerning CFA, Convergent and Discriminant Validity. Model fit indices of Measurement model.		Introduction to SEM, Some reflections on Regression and SEM		Hands on for Measurement model. Importance of a good Conceptual Model for running a Structural Model.
<b>07-11-2019 (THU)</b>	Model Fit Indices of structural model in Co-Variance Based SEM (CB-SEM).		Direct and Indirect effects, Issues pertaining to endogenous and exogenous variables, Path modelling.		Hands on for structural modelling in Co-Varaince Based SEM.
<b>08-11-2019 (FRI)</b>	Introduction to SmartPLS 3.0 Software, Usefulness and Application of Variance Based SEM in SmartPLS		Convergent and Discriminant Validity, Hypothesis Testing by Bootstrapping process. Practical Sessions.		Path Analysis, Higher Effects in SEM: Evaluating Mediation Effects in SmartPLS. Types of Mediation.
<b>09-11-2019 (SAT)</b>	Moderation Effects, Types of Moderation- Categorical Moderation and Interaction Moderation Multi-Group Analysis (MGA).		Conceptual Model Building for SEM applications – A Case Study using TAM		Introduction to R and R Studio.
<b>10-11-2019 (SUN)</b>	Practical Sessions in R Studio				Practical Application of R Studio in Research.