

**Ambedkar University Delhi**  
**Course Outline**  
**Monsoon Semester (July-December 2017)**

**Course Code:** SES202204

**Title:** An Introduction to Quantitative Methods for Social Science Research with a special focus on Education Research

**Type of Course:** Compulsory

**Cohort for which it is compulsory:** MA Education (ECCE) and PG Diploma (ECCE) (It is a compulsory course but optional with Qualitative research methods course. Students can opt for any one course out of the two courses).

**Cohort for which it is elective:** MA Education 3<sup>rd</sup> Semester

**No of Credits:** 4

**Semester and Year Offered:** 3rd Semester (Monsoon Semester 2017)

**Course Coordinator and Team:** The course will be taught by Dr. Vikas Baniwal

**Email of course coordinator:** vbaniwal@aud.ac.in

**Pre-requisites:** Students must have taken all the courses of Semester 1 and Semester 2 in M.A. (Education) and M.A. Education (Early Childhood Care and Education)

**AIM:**

*This course is designed to:*

1. Provide students with a well- rounded understanding of research methods- quantitative, qualitative and mixed- methods approaches.
2. Familiarize students with quantitative research methods and their application in diverse research settings.
3. Familiarize students with concepts in descriptive and inferential statistics
4. Introduce students to regression analysis.
5. Familiarize students with data sets available in the country to pursue their own research.
6. Enable students to comprehend and interpret graphs and summary statistics presented in academic papers, reports and studies and skills for presentation of own research findings.
7. Familiarize students with Excel and STATA and increase their ability to navigate these software on their own.
8. By the end of the course, students should be able to design their own research and employ elementary statistics.

## **Brief description of modules/ Main modules:**

### **Unit 1: Quantitative research methods**

The course will begin with a brief discussion on the epistemological and ontological underpinnings of quantitative, qualitative and mixed methods, reasons as to why one should choose quantitative or qualitative approach and typical scenarios where the two approaches are combined, so as to give students a rounded understanding of research methods.

### **Unit 2: Introduction to statistics -I**

This unit discusses descriptive statistics viz. types of variables, frequency distribution, and graphical representation of data, measures of central tendency and measures of dispersion. Students will be introduced to both Excel and STATA in this unit and these sessions will continue throughout the course. The unit concludes with introducing students to data sets that are available in India for education research.

### **Unit 3: Constructing learning assessment tests**

The unit will then move on to a discussion on construction of learning assessment tests- principles, issues and concerns. The unit will familiarise students with descriptive statistics in order to be able to construct learning assessment tests.

### **Unit 4: Probability distributions**

This unit introduces normal probability distributions, which is the most important distribution in statistics and is the foundational base for inferential statistics, z- score problems, sampling distributions and the central limit theorem.

### **Unit 5: Statistical inference and ANOVA**

This unit discusses how to use sample data to estimate population parameters. The topics of discussion are point versus interval estimate and significance tests for means and proportions and decisions and types of errors that typically arise in hypotheses tests.

### **Unit 6: Correlation and Linear Regression (16 hours)**

Bivariate linear regression model will be discussed in this unit. The discussion will be quite detailed since understanding of bivariate regression is essential to further understand multivariate regression and advanced statistical techniques. We will initiate the discussion with the use of straight line to describe a particular form of relationship between two continuous variables and scatter plots to check if the relationship is approximately linear, followed by the use of least squares method to estimate the best line to describe a relationship, variability of data about the straight line, Pearson's correlation to measure the strength of linear association between two variables and statistical tests for significance for a regression analysis. This unit will conclude with a brief introduction to multiple regression analysis.

### Assessment Details with weights:

1.	Mid- term and Final examination	40%
2.	Assignment(s)	30%
3.	Class participation which includes attendance and participation in group presentation	10%
4.	Meeting with mentor to discuss plans for dissertation proposal. Submit progress report	20%

### Core readings

ASER Centre. (2014). *Middle Schools in India: Access and Quality* | MacArthur Foundation Grant No. 11-99655-00-INP. (A.2: Baseline survey questionnaires)

ASER Centre. (2012). Report on Year 1, *Strand A of the India Early Childhood Education Impact study*, covering the period September 2011-December 2012. Available online at [http://img.asercentre.org/docs/Research%20and%20Assessments/Current/Education/eces-trandareport2011-12dec30\\_final.pdf](http://img.asercentre.org/docs/Research%20and%20Assessments/Current/Education/eces-trandareport2011-12dec30_final.pdf) (Chapter 1: Introduction and Overview, pp. 4- 8).

ASER Centre, *Sample Design of Rural ASER*. Available online at [http://img.asercentre.org/docs/Aser%20survey/Sampling/Sample\\_Design\\_of\\_RuralASER\\_1.pdf](http://img.asercentre.org/docs/Aser%20survey/Sampling/Sample_Design_of_RuralASER_1.pdf)

Centre for Early Childhood Education and Development. (2015). *Quality and Diversity in Early Childhood Education: A view from Andhra Pradesh, Assam and Rajasthan*. (Section 1.4 and Annexure 1)

Cohen, L., L. Manion and K. Morrison. (2000). *Research Methods in Education*. Fifth Edition. Routledge Falmer

Converse, J. and S. Presser. (1986). *Survey Questions: Handcrafting the Standardized Questionnaire*, Issue 63.

Creswell, J. W. (2003). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches*. Second Edition. University of Nebraska (Chapter 1, pp.3- 26).

Healey, Joseph F., Ninth Edition. *Statistics- A Tool for Social Research*, Wadsworth Cengage Learning, Student Copy ISBN-978-1-111-18636-4.

Hutchison, D. and B. Styles (2010). *A guide to running randomised controlled trials for educational researchers*. National Foundation for Education Research. (Chapter 3, Chapter 4 and Chapter 5, pp. 16- 38).

King, B. M., Rosopa, P. J., & Minium, E. W. (2010). *Statistical reasoning in the behavioral sciences*. Wiley Global Education.

King, G. R. O. Keohane & S. Verba (1994) *Designing Social Inquiry*. Princeton University Press. (Chapter 1, pp. 3- 32).

Muralidharan, K. and V. Sundaram (2013). *The aggregate effect of school choice: Evidence from a two-stage experiment in India*. NBER Working paper 19441. Available online at <http://www.nber.org/papers/w19441>

Office of Quality Improvement. (2010). *Survey fundamentals: A guide to designing and implementing surveys*. Pew Research Centre. Questionnaire Design. Available online at <http://www.pewresearch.org/methodology/u-s-survey-research/questionnaire-design/#measuring-change-over-time>

Parker, I. (2010). The Poverty Lab: Transforming Development Economics, One Experiment at a time. *The New Yorker*. (May 17, 2010) Available online at <http://www.newyorker.com/magazine/2010/05/17/the-poverty-lab>

Tashakkori, A. and T. Charles (1998). *Mixed Methodology: Combining Qualitative and Quantitative Approaches*. Sage Publications. (Part three: applications, examples and future direction of mixed model research)