

**CENTRE FOR STUDIES IN SCIENCE POLICY  
SCHOOL OF SOCIAL SCIENCES**

<b>Course Title</b>	<b>: Research Methodology</b>	
<b>Course No. &amp; Type</b>	<b>: SP 604 (M.Phil./Ph.D.) Compulsory</b>	
<b>Credit</b>	<b>: 4</b>	
<b>Faculty in charge</b>	<b>: Madhav Govind &amp; Rohan D'Souza</b>	
<b>Mode of Evaluation</b>	<b>: 1. Term Paper</b>	<b>50%</b>
	<b>: 2. End Semester Exam</b>	<b>50%</b>
<b>Instruction Method</b>	<b>: Lecture-cum-Seminar</b>	

**Introduction:**

This course is designed with the objective of providing an interdisciplinary research perspective to the students coming from diverse academic backgrounds. The course explores various research methods (both qualitative and quantitative) used in Science & Technology Studies by drawing upon a range of theoretical and empirical research techniques that are current in the social sciences. The theoretical aspects of the course will comprise an exploration of various theories, concepts and terms that are the parts of the research methodology. The empirical aspects will provide a broad understanding of various statistical, scientometric and other related research techniques such as construction of scales, framing of research questionnaires and sampling methods etc.

This course is divided into two parts: first part deals with conceptual and theoretical perspectives and second with tools and techniques for empirical research.

**Part-1:**

**Research methodology: Theoretical Perspective**

1. **Conceptual understanding:** Science and Social Science contrast; empiricism and objectivity in social sciences; the problems of induction, inference and prediction; Concepts of rationality (perfect and bounded rationalities) and their relevance in modeling technological change. Relationship between theory and empirical research

## 2. Different Methodological Perspectives:

- i) Positivist and non-positivist approaches and their relevance for Social studies of science;
- ii) Hermeneutical traditions: interpretative method
- iii) Ethno-methodology; Anthropological method
- iv) Historical methods including prosopographical perspectives etc.

## 3. Information Technology and its Role in Social Research; Use of SPSS programme

### Part-2:

### Empirical Research: -

#### 1. Research Design:-concepts, types and formulation.

- (a) Defining the research question/problem. ; Survey of relevant literatures and formulation of hypothesis
- (b) Sampling methods (Probability and non-probability); case study method.
- (c) Measurement techniques and construction of scales.
- (d) Data: types, sources, scope and limitations; Tools and techniques of data collection: Observation (participant and non-participant), Interview, Questionnaires (structured and unstructured).

#### 2. Data Analysis:

- (i) Preliminary stage of data analysis-coding, classification and tabulation.

**(A)Qualitative tools: It** will focus on different mode of document/*text analysis* like:

Hermeneutics (Interpretative analysis), Narrative or performance analysis, Discourse analysis, Grounded theory, Content analysis, *Ethnographic Decision Model (EDM)*.

#### **(B) Quantitative tools: Use of Statistics**

##### **(a) Descriptive Statistics:**

Frequency distribution, measurement of central tendency (mean, median and mode);

Dispersion; Standard deviation and percentage of error.

**(b) Statistical Inference:** Chi-square test( $\chi^2$ ); Testing of hypothesis; Analysis of variance and covariance (ANOVA& ANOCOVA); Regression

**3 Scientometrics:** Concept and Technique; Scientometrics and S&T Policy; Bibliometrics; Technological studies based on patent analysis; Quantitative indicators of science

**4. Presentation** and Communication of Research Findings; Methods and style of Referencing.

## Essential Reading List:

- Antonius, Rachad (2004) *Interpreting Quantitative Data with SPSS*. New Delhi: Sage Publications
- Bernard ,Russell H. (2000). *Social Research Methods*. New Delhi: Sage Publication
- Brannen, J. (ed.) (1992) *Mixing Methods: Qualitative and Quantative Research*. Aldershot: Avbury.
- Cornic, Delroy L. (1995). "Cyberspace: Its Impact On The Conventional Way Of Doing and and Thinking About Research".[.htt://www.csaf.org/cyber.htm](http://www.csaf.org/cyber.htm)
- Fink, Arlene (2005) *Conducting Research Literature Reviews: From the internet to Paper*. New Delhi: Sage.
- Fundamentals of Statistics* (volume 1&2) by Goon, Gupta and Dasgupta .Calcutta: World Press.
- Hesse- Biber, S.N. & Leavy, Patricia. (2006). *The Practice of qualitative Research* .New Delhi: Sage
- Leydesdroft, C.(1987). "Various Methods for the Mapping of Science" *SCIENTOMETRICS* 11:291-320
- Moed, Henk F. (2005) "Citation analysis of scientific journals and journal impact measures" *Current Science* Vol. 89. (12) 25 December PP. 1990-1996.
- Nagpaul,P.S.et.al (eds.) (1999). *Emerging Trends in Scientometrics* New Delhi: Allied Publisher..
- Popper, K. R. (1963) *Conjectures and Refutation: The Growth of Scientific Knowledge*. London: Routledge& Kegan Paul . PP. 33-41.

## Supplementary Reading List:

- Ackoff, Russell L. 1967. *Design of Social Research* .Chicago: Chicago University Press
- Allwood, C.M. 1997. "The Function and Handling of Research Problems in the Social Science" *.Social Studies*.10:50-73.
- Bailey, Kenneth D. (1978). *Methods of Social Research*. New York: Free Press
- Bernard, H. R. (1994). *Research Methods in Anthropology*. California: Altimira.
- Blalock, Hubert M.(1982). *Conceptualisation and Measurement in Social Sciences*. Beverly Hills: Sage Publication.
- Braun, Claud M.J. and Baripeau,Jacinth 91985). " Link between the social and Material Sciences:The Case of scientific Psychology" *.Science and Society*.49(20 :131-158
- Braun, Tibor & Diospatonyi (2005) " Counting the gatekeepers of international science journals a worthwhile science indicator" *Current Science* . Vol. 89 (9) Nov. 10 PP.1548-1551.
- Bryman,A. (1984.) " The Debate about Quantitative and Qualitative Research; A Question of Method or Epistemology." *British Journal of sociology*. 35 (1) :75-92.

- Dey, I (1993) *Qualitative Data Analysis: A User Friendly Guide for social Scientists*. London: Routledge& Kegan Paul.
- Farnell, B. & Graham, L. R. (1998) 'Discourse Centered Methods' in Bernard, H. R. (ed.) *Handbook of Methods in Cultural Anthropology*. (pp.411-457) California: Altimira
- Folk, Charles (1986) 'The role of quantitative information in science and technology policy formulation' in Roy M. Macleod (ed.) *Technology and the Human Prospect*. London: Frances Pinter Pub. PP119-139.
- Fowler, Floyd J.( 1984). *Survey Research Methods*. Beverly Hills: Sage.
- Glaser, B. G. & Strauss, A .(1967) *The Discourse of Grounded Theory: Strategies for Qualitative Research*.New York: Aldine.
- Goon, A.M. (1979). *Fundamental of statistics*.Culcutta:World Press.Vol.1&2.
- Holton, Gerald (1999) *The Scientific Imagination* . Hyderabad: University Press Chapter 6 "Can science be measured" PP.199-228.
- Hyman, Herbert H. (1970). *Interviewing in Social Research*. Chicago: Chicago University Press.
- Koertge, Noretta 1998 *House built on Sand : Exposing Postmodernist myth about Science*. Oxford: Oxford Uni. Press
- Kolakowski, Leszek (1972) *Positivist philosophy from Hume to the Viana Circle*,(Trans by Norbet Guterma).Hormondsworth: Penguin
- Kothari, C.R. 1990. *Research Methods & Techniques*. New Delhi: Wiley Eastern Ltd.
- Kreis, Der Wiener (1973) "The Vienna Circle of the scientific conception of the world" in Marry Neurath & Robert S Cohaen (eds.) *Ottoneurath Empiricism and Sociology*. Boston: D. Reidel Pub Co. pp.301-318.
- Krippendorff, Klaus.(1980). *Content analysis : an introduction to its methodology*. Beverly Hills: Sage.
- Leinhardt, Samuel & Wasserman, Stanley S.(1979). *Explotory Data Analysis: An Introduction to Selected Methods*. *Sociological Methodology*, Vol. 10:311-365.
- Lewis, Grant (2005) "Beyond SCI citations- New ways to evaluate research" *Current Science* Vol. (9) 10 November PP. 1524-1530.
- Leydesdorff, Loet ( 2005). 'Evaluation of research and evolution of science indicators.'" *Current Science*. Vol. 89 (9) 10 November :1510-1517.
- Marini, Margaret Mooney & Singer, Burton (1988). "Causality in the Social Sciences".*Sociological Methodology*. Vol.18:347-409.
- Metzger, Norman & Zare, Richard I. (1999). "Interdisciplinary Research: From Belief to Reality" *Science*. Vol. 28(29<sup>th</sup> January):642-643.

- North, Robert C. (1963). *Content Analysis : A Handbook with application for the study of international crisis*. North Western.
- Presser, Stanley & Blair, Johny (1994). "Survey Pre-testing: Do different Methods Produce different Results?". *Sociological Methodology*. vol.24:73-76.
- Price, D. d.S. (1963) .*Little Science, Big Science*. New York: Columbia University Press.
- Roth, Dana L.( 2005) " The emergence of competitors to the *Science Citation Index* and *Web of Science*" *Current Science* Vol. 89. (9) 10 Nov. PP.1531-1536.
- Rubinstein, A.(1998) .*Modeling Bounded Rationality*. MIT Press.( Chapter 2 & 3)
- Scharnhorst, Andrea & Thelwall, Mike( 2005) "Citation and hyperlink networks" *Current Science* vol. 89 (9) 10 November .PP. 1518-1518-1523.
- Shipmen, Marten. (1982). *Limitations of social research*. London: Longman
- Steward, David W. and Kamins, Michael A. (1993). *Secondary Research Information Sources and Methods*. New Delhi: Sage Publication.
- Strauss, Anselm L. (1986). *Qualitative analysis for social scientists*. Cambridge: Cambridge University Press.
- Weinberg, Darin (ed.)( 20020. *Qualitative research methods*. Malden: Blackwell Publication

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