Ph D. Course-work in Library & Information Science
(1 Semester Programme)

(This will run simultaneously with M.Phil. course work)

Course code	Course Title	C/E/F	Credits				Marks	
			L	**T**	**P**	**C**	**Exam**	**IA**
PHDLIS-01	Frontiers in Library & Information Science	C	2	0	1	3	50	00
PHDLIS-02	Research Methodology	C	2	0	1	3	50	25
PHDLIS-03	Quantitative Techniques	C	2	0	1	3	50	25
PHDLIS-04	Software in LIS Studies	C	0	0	3	3	00	50/100
	Sub Total		6	0	6	12	150	100/150
	Total	**Credit=12**					**Marks=250/300**	

Paper Code: PHDLIS-01
Paper Name: FRONTIERS IN LIBRARY & INFORMATION SCIENCE

The course will identify the latest developments and research in LIS domain. Some of the topics are enumerated below. Any relevant topic will be included here.

- New theories, models, methods, tools in LIS domain
- Advances in information organization and control e.g., Web ontology, semantic web, Taxonomy, RDA, Bibframe
- Interdisciplinarity in LIS domain
- Various Open movements and Libraries
- Information behaviour in digital environment
- Information overload
- Changing role of public libraries
- Technology adoption
- Big data applications in libraries
- Challenges in LIS education & profession

Suggested Readings:

Chen, C. & Larsen, R. (Eds.). (2014). *Library and information sciences: Trends and research.* Heidelberg: Springer.

Davies, J., Studer, R. & Warren, P. (2006). *Semantic Web technologies: Trends and research in ontology-based systems.* Chichester, England: John Wiley.

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Deards, K.D. & Springs, G.R. (2014). *Succession planning and implementation in libraries: Practices and resources.* Hershey, PA: Information Science Reference.

Gutiérrez, C.R. (Ed.).(2012). *Advances in knowledge representation.* Rijeka, Croatia: InTech.

Hansson, T. (Ed.).(2008).*Handbook of research on digital information technologies : Innovations, methods, and ethical issues.* Hershey, PA: Information Science Reference.

Katsirikou, A. (Ed.). (2011). *Open Access to STM information: Trends, models and strategies for libraries.* Berlin: Walter de Gruyter.

Kock, N. (Ed.). (2010). *Evolutionary psychology and information systems research: A new approach to studying the effects of modern technologies on human behavior.* New York: Springer.

McGrath, W.E. (Ed.). (2002). Current theory in library and information science. *Library Trends: Special issue*, 50(3),309-574.

Melucci, M. & Baeza-Yates, R. (Eds.). (2011). *Advanced topics in information retrieval.* Berlin: Springer.

Yu, H. & Breivold, S. (2008). *Electronic resource management in libraries : research and practice.* Hershey, PA: Information Science Reference.

Paper Code: PHDLIS-02
Paper Name: RESEARCH METHODOLOGY

- Concept, meaning, objectives and processes of research. Problems of research. Research question. Types of research. Basic and Applied research, Descriptive, Experimental and Analytical research, Quantitative and Qualitative research, Conceptual research . Ethical aspects of research.

- Research Design and Methods. Meaning, need and features of good research design. Identification and formulation of problem; Hypothesis: Types of research design. Stages of research and designing research proposal. Literature search- Print, Non-Print and digital resources. Descriptive, Historical, Scientific methods. Experimental and Delphi method. Survey method. Case study method.

- Data collection, Data Analysis, Reporting. Data collection, survey method, Sampling techniques. Data collection tools: Questionnaire, Schedule, Interview, Observations, Scales. Data analysis and interpretation. Data presentation-tabulation, graphical presentation, use of statistical packages.   - Research reporting: structure, style, contents, guidelines, quality parameters and citation.

- Trends in Researches. Research scenario in Science and Technology. Collaborative researches, Relay research. Library and Information Science research. Impact of new technologies, e-citation, on-line survey, Webliography, Organizations, Institutions, Experts.

- Technical Writing and Editing. Definition and attributes of technical writing. Documentation and referencing. Jobs of editor. Proof correction.

Suggested Readings:

American Psychological Association.(2010).The publication manual of the American Psychological Association (6th ed.). Washington, DC: APA.

Best, J.W. & Kahn, J.V. (2006). *Research in education.* 10th ed. Boston: Pearson.

Busha, C. & Harter, S. (1980). *Research methods in librarianship: techniques and interpretations.* New York: Academic Press.

Bushaway, R. W. (2003). Managing Research. Maidenhead, England: Open University Press.

Connaway, L.S. & Powell, R. R. (2010). *Basic research methods for librarians*. (5th ed.). Santa Barbara, CA: Libraries Unlimited.

Gerson, S. J. & Gerson, S. M. (1992). *Technical writing: Process and product.* Englewood Cliff's: Prentice Hall.

Gorman, G.E. & Clayton, P. (2004). *Qualitative Research for the Information Professional: A practical handbook* (2nd ed.). London: Facet Publishing.

Huckin, T. N. & Olsen, L. A. (1991). *Technical writing and professional communication for non-native speakers of English.* (2nd ed.). New York: McGraw-Hill.

Khan, M. A. (2002). *Research methods in library and information science*. New Delhi: Cosmo Publications.

Kothari, C.R. (2004). *Research methodology : methods and techniques* (2nd rev. ed.). New Delhi : Wiley Eastern Publishers.

Krishan Kumar (1992). *Research methods in library and information science*. New Delhi: Vikas Publishing House.

Kuhn, T.S. (1996). *The structure of scientific revolutions*. (3rd ed.). Chicago: University of Chicago Press.

Lawal, I. O. (2009). *Library and information science research in the 21st century: a guide for practicing librarians and students*. Oxford, UK: Chandos Pubishing.

Modern Language Association of America. (2008). *MLA style manual and guide to scholarly publishing*. (3rd ed.). New York: MLA.
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Moore, N. (2006). *How to do research* (3rd ed.). London: Facet Publishing.

Neelameghan, A. (1975). *Presentation of ideas in technical writing.* New Delhi: Vikas Publishing House.

Ohdedar, A.K. (1993). *Research methodology.* Calcutta: Bengal Library Association.

Rubens, P. (2001). *Science and technical writing :A manual of style* (2nd ed.). New York: Routledge.

Simpson, I. S. (1990). *How to interpret statistical data: A guide for librarians and information scientists*. London: Library Association.

Slater, Margaret, (Ed.). (1990). *Research methods in library and information studies.* London: Library Association.

University of Chicago. (2010). The Chicago manual of style . (16th ed.). Chicago: University of Chicago Press

Paper Code: PHDLIS-03
Paper Name: QUANTITATIVE TECHNIQUES

- Statistical methods - Introduction. Measures of Variability and skewness. Sampling & sample designs. Correlation studies and regression analysis. Hypothesis testing, Null and Alternative Hypothesis, Sampling error, Chi-Square test. Analysis of Variance and Covariance. Multivariate Analysis Techniques . Time series – Components, measurement of trend and statistical fluctuations.

- Operations Research (OR) - Meaning, nature, methodology and utilities. OR techniques. .Work study. Queuing theory. Game theory. Network analysis. CPM and PERT.

- Project using statistical packages e.g., R.

Suggested Readings:

Albert, J. & Rizzo, M. (2012). *R by example*. New York: Springer.

Braun, W.J. & Murdoch, D.J. (2007). *A first course in statistical programming with R*. Cambridge, N.Y.: Cambridge University Press.

Gun, A.M., Gupta, M.K. & Dasgupta, B. (2008). Fundamentals of Statistics. (8th rev. ed.). 2 vols. Kolkata: World Press, 2008.

Hafner, A.W. (1988). *Descriptive statistical techniques for librarians.* Chicago: American Library Association.

Mustafi, C.K. (2012). *Operations research: Methods and practice.* New Delhi: New Age International Publisher.

Pal, M.N., Chatterjee, A.K. & Mukherjee, S. K. (1991). *Introduction to work study* (3rd rev ed.). New Delhi: Oxford and IBH Publishing.

Ravichandra Rao, I.K. (1983). *Quantitative methods for library and information science.* , New Delhi: Wiley Eastern.

Sehgal, R.L. (1998). *Statiscal techniques for librarians.* New Delhi: Ess Ess Publications.

Simpson, I. S. (1988). *Basic statistics for librarians* (3rd ed.). London: Library Association.

Taha, H.A. (2014). *Operations research: An introduction* (9th ed.). New Delhi: Pearson Education India.

Paper Code: PHDLIS-04
Paper Name: SOFTWARE IN LIS STUDIES

course will identify various software required for LIS research. The students will learn to install and handle these software independently. Some examples are given below. Any other software to be added as needed.

- Content management software e.g., Drupal, Joomla, Moodle, Wordpress
- Concept mapping software e.g., CMapTools
- Data and text mining software e.g., Weka
- Database management software e.g., MariaDB, MySQL, PostgreSQL
- Digital library software e.g., DSpace, E-Print
- Enterprise search engines e.g., Lucene, Solr
- Graphics software e.g., GIMP
- Information visualization software, e.g., GraphViz, Xmdvtool

- Knowledge networking software e.g., Pajero
- Knowledge management software e.g., Xmind
- Library automation software e.g., Koha, Evergreen
- Middleware software e.g., JBoss, Jakarta Tomcat
- Mind mapping software e.g., Freemind, Coggle
- Reference management software e.g., Zotero
- Resource discovery software e.g., Vufind
- Semantic web tools e.g., Protégé
- Virtual Machine Emulator e.g., VMWare
- Wiki software e.g., MediaWiki

Suggested Readings:

Bartholomew, D. (2014). *MariaDB cookbook.* Birmingham: Packt Publishing.

Biemann, C. & Mehler, A. (Eds.). (2014). *Text mining: From ontology learning to automated text processing applications: Festschrift in honor of Gerhard Heyer.* Heidelberg: Springer.

Canavan, T. (2011). *CMS security handbook: The comprehensive guide for WordPress, Joomla, Drupal, and Plone.* Indianapolis, IN: Wiley.

Derr, M. & Symes, T. (2011). *Joomla: Visual quickstart guide* (2nd ed.). Berkeley, CA: Peachpit Press.

Engard, N.C. (2010). *Practical open source software for libraries*. Oxford: Chandos.

Fitzgerald, B. et al. (2011). *Adopting open source software : A practical guide.* Cambridge, Mass.: MIT Press.

Horridge, M. (2011). *A practical guide to building OWL ontologies using Protégé 4 and CO-ODE tools* (1.3ed.). Manchester: University of Manchester.

Hillar, S.P. (2012). *Mind mapping with FreeMind: Easy recipes to increase productivity and creativity using powerful free tools—FreeMind and Freeplane.* Mumbai: Packt Publishing.

Karambelkar, H. (2013). *Scaling Big Data with Hadoop and Solr: Learn exciting new ways to build efficient, high performance enterprise search repositories for Big Data using Hadoop and Solr.* Mumbai: Packt Publishing.

Kumar, J. (2015). *Apache Solr search patterns: Leverage the power of Apache Solr to power up your business by navigating your users to their data quickly and efficiently.* Mumbai: Packt Publishing.

Laliwala, Z. & Shaikh, A. (2013). *Web crawling and data mining with Apache Nutch: Perform web crawling and apply data mining in your application.* Mumbai: Packt Publishing.

Library and Information Technology Association. (2002). *Major open source web finding tools and digital library systems for librarians*. Palm Desert, CA: American Library Association.

Maimon, O. & Rokach, L. (Eds.). *Data mining and knowledge discovery handbook* (2nd ed.). New York: Springer.

Moon, B.M. et al. (2011). *Applied concept mapping: Capturing, analyzing, and organizing knowledge.* Boca Raton: CRC Press.

Okada, A., Shum, S.J.B. & Sherborne, T. (Eds.). (2014). *Knowledge cartography: Software tools and mapping techniques.* London: Springer.

Papy, F. (2016). *Digital libraries: Interoperability and uses.* London: ISTE Press.

Robertson, J. G. & Fitzgerald, B. (2013). *Drupal for Education and E-Learning: Create web-based, content-rich tools for teaching and learning* (2nd ed.). Mumbai: Packt Publishing.

Tiggeler, E. (2013). *Joomla! 3 Beginner's Guide: A clear, hands-on guide to creating perfect content managed websites with the free Joomla! CMS.* Mumbai: Packt Publishing.