

# Library and Information Science

A course book for PhD coursework and pre-doctoral study

**Part I** Knowledge Society and LIS Research

**Part II** ICT Application and Digital Library

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## **Library and Information Science**

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**Part II** ICT Application and Digital Library

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## Preface

Library and Information Science (LIS) has undergone a remarkable transformation in response to the rapid growth of knowledge, information and communication technologies, and digital information environments. Libraries are no longer confined to the traditional role of collecting, organizing and preserving printed documents; they have evolved into dynamic knowledge centres that facilitate research, learning, collaboration, digital access and the creation and dissemination of scholarly information. In this changing environment, an understanding of the knowledge society, LIS research methodologies, information technologies and digital libraries has become essential for aspiring researchers and information professionals.

This book, *Library and Information Science: A Course Book for PhD Coursework and Pre-Doctoral Study*, has been developed to provide a structured and comprehensive foundation for advanced study and research in Library and Information Science. It is particularly intended for PhD scholars, pre-doctoral students, research scholars and students preparing for advanced academic and research-oriented programmes in LIS.

The book is organized into two complementary parts. **Part I, “Knowledge Society and LIS Research,”** introduces the conceptual foundations of the knowledge society and examines the changing role of libraries and information institutions in knowledge creation and dissemination. It also provides an academic foundation for understanding LIS research, research processes, scholarly communication and contemporary research perspectives. The emphasis is placed on developing a research-oriented understanding that can help scholars identify research problems, examine information phenomena critically and undertake systematic investigation.

**Part II, “ICT Application and Digital Library,”** focuses on the technological transformation of library and information services. It discusses the application of Information and Communication Technologies (ICT) in libraries and introduces the concepts, development, components and services associated with digital libraries. The section aims to help learners understand how emerging technologies are reshaping information organization, retrieval, access, preservation and dissemination.

An important objective of this book is to bridge **theoretical understanding with contemporary professional and research practices**. The topics have therefore been presented in a systematic manner, beginning with fundamental concepts and progressing towards advanced applications and research-oriented perspectives. Wherever appropriate, concepts are explained through examples, structured discussions and academic terminology to make the subject accessible while maintaining the depth expected at the doctoral level.

The field of LIS is continuously evolving with developments such as digital scholarship, open access, research data management, artificial intelligence, knowledge management, information analytics and emerging digital information ecosystems. Consequently, LIS scholars must develop not only subject knowledge but also the ability to critically evaluate technologies, research trends and changing information needs. This book seeks to contribute to that development by providing a foundation upon which further specialized study and original research can be built.

We hope that this course book will serve as a useful academic companion for **PhD coursework, pre-doctoral study, research preparation and advanced learning in Library and Information Science**. It is also intended to encourage readers to look beyond established practices and explore the emerging questions, technologies and research possibilities that are shaping the future of the discipline.

We sincerely hope that this book will support scholars in developing a deeper understanding of LIS and inspire them to undertake meaningful, rigorous and socially relevant research in the field.

### Authors

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# **The Syllabus Covered by This Book**

The book covers the following syllabus in full. Each unit is treated as one chapter, in the order given: units 1 to 5 of Part I are Chapters 1 to 5, and units 1 to 5 of Part II are Chapters 6 to 10. Where a syllabus entry names an example that has since been superseded, the book gives the current position and states what it replaced.

## **PART I (Knowledge Society and LIS Research)**

### **Unit 1: Library, Information and Knowledge Society**

- Information Society, Knowledge Society: Definition, Need and Purpose
- Library Profession: Professional Ethics
- Library Legislation: Need & Purpose
- Copy Right, Intellectual Property Right (IPR) and Digital Right Management (DRM)
- National Knowledge Commission: Recommendations and Implication in LIS

### **Unit 2: Modern Methods of Knowledge Organisation**

- Modern trends in Library Classification
- Trends in Library Cataloguing: OPAC and WebOPAC
- Standards - ISBD, CCF, ISO-2709, Z39.50 and RDA
- Metadata- MARC and Dublin Core
- Sources of Information: Primary, Secondary and Tertiary: Web / Digital Resources: Evaluation of reference source; Abstracts and indexes, E-journals, E-books and ETDs

### **Unit 3: Modern Management in Library and Knowledge Resource Centre**

- Principles of Management: Implications in LKRC
- Human Resource Management: Concept, need and purpose
- Job Evaluation & Performance appraisal in LICs
- Total Quality Management: Definition, scope and purpose and application to Libraries and information centres
- Knowledge Management: Tools and Techniques

### **Unit 4: Research Methods, Techniques and Tools in LIS**

- Research Methods in LIS: Historical Research, Survey Research and Experimental Research
- Case Study, Observation Method, Scientific Method, Delphi Method Sampling Techniques
- Data Collection Tools: Questionnaire, Interview, Schedule, Observation, Scales and Check Lists, Historical / recorded
- Bibliometric Study: Bibliometric Laws, Citation Analysis, Scientometrics, Informetrics and Webometrics
- Computerized data analysis: SPSS / Excel

### **Unit 5: Recent Trends in LIS**

- Literature Review, Critical Review of Research in LIS in India
- Sources of Information on Internet: DOAJ, Wikipaedia, Web Resources
- Citation Style: Structure, Guidelines for Citation / References
- Modern trends of Research in LIS: Electronic theses and dissertations
- Designing project proposals, Funding agencies, and LIS Schools

## **PART II (ICT Application and Digital Library)**

### **Unit 1: Library Automation**

- Library Automation: Planning and Implementation
- Library Management Software; Information Search strategies; Software selection criteria; OPAC and Web OPAC
- RFID Technology and Electronic Surveillance
- Library automation scenario in India with special reference to NE India
- DBMS: Creation of Database using any DBMS Package: SOUL / KOHA

### **Unit 2: Library Networking**

- Library Networks: Library Networking in Indian perspectives: INFLIBNET, DELNET; IFLANET
- Library consortia in Indian context UGC-INFONET, INDEST, CSIR & Others E-Resources Consortia
- Digital Library: Meaning, digitization, planning and steps; Digital Preservation
- Institutional Repositories: Need and Benefits; OAI and Metadata harvesting
- Internet and Web 2.0

### **Unit 3: Digital Information Resources on LIS**

- Digital Information Resources and formats of digital resources
- Subject Gateways and Digital Libraries on LIS, Subject Directories in Web
- Journal Portals, Publisher's Portals, Book Reviews, Book Selection
- Virtual Reference Tools: Commercial Tools (e.g. Xrefer.com), Cross-Publishers
- Data mining and data warehousing

### **Unit 4: Web Technology & Interactive Digital Resources**

- Interactive Digital Information Resources: Nature, Features and Types
- LIS Discussion Forums and Mailing Lists (ListServes) – LIS in general and Lists
- Blogs and Biblioblogsphere: Nature, Features, Types, Projects and Services
- Wikis and Wikipedias in LIS: Nature, Features, Types, Projects and Services
- Library 2.0 Tools: Information Mashup, Social Network etc.

### **Unit 5: Design and Development of Digital Library**

- Traditional, automated, digital and virtual library systems – comparative study
- Digital Library Development: Hardware, Software, Process, File formats, Issues, policies and principles
- Free/Libre Open Source Software (FLOSS): GSDL, MyLibrary, WWWISIS, GENISIS etc.
- National & International digital library systems
- Evaluation parameters and models

## Abbreviations

| Abbreviation | Expansion                                                                  |
|--------------|----------------------------------------------------------------------------|
| AACR2        | Anglo-American Cataloguing Rules, second edition                           |
| ABCD         | Automation of Libraries and Documentation Centres                          |
| AIP          | Archival Information Package                                               |
| ANRF         | Anusandhan National Research Foundation                                    |
| API          | Application programming interface                                          |
| BIBFRAME     | Bibliographic Framework Initiative                                         |
| CCF          | Common Communication Format                                                |
| CDS/ISIS     | Computerised Documentation Service / Integrated Set of Information Systems |
| CeRA         | Consortium for e-Resources in Agriculture                                  |
| CLOCKSS      | Controlled LOCKSS                                                          |
| COUNTER      | Counting Online Usage of Networked Electronic Resources                    |
| DDC          | Dewey Decimal Classification                                               |
| DELNET       | Developing Library Network                                                 |
| DeLCON       | DBT Electronic Library Consortium                                          |
| DELOS        | European network of excellence on digital libraries                        |
| DIP          | Dissemination Information Package                                          |
| DOAB         | Directory of Open Access Books                                             |
| DOAJ         | Directory of Open Access Journals                                          |
| DOI          | Digital object identifier                                                  |
| DORA         | San Francisco Declaration on Research Assessment                           |
| DPDP Act     | Digital Personal Data Protection Act, 2023                                 |
| DPLA         | Digital Public Library of America                                          |
| DRM          | Digital rights management                                                  |
| DRTC         | Documentation Research and Training Centre                                 |
| DTD          | Document type definition                                                   |
| ETD          | Electronic thesis or dissertation                                          |
| ETL          | Extract, transform and load                                                |
| FLOSS        | Free and open source software                                              |
| FRBR         | Functional Requirements for Bibliographic Records                          |
| GSDL         | Greenstone Digital Library software                                        |
| HRM          | Human resource management                                                  |
| ICP          | Statement of International Cataloguing Principles                          |
| ICSSR        | Indian Council of Social Science Research                                  |
| IFLA         | International Federation of Library Associations and Institutions          |
| IIIF         | International Image Interoperability Framework                             |
| ILA          | Indian Library Association                                                 |
| ILS          | Integrated library system                                                  |
| IndCat       | Online union catalogue of Indian university libraries                      |
| INDEST       | Indian National Digital Library in Engineering Sciences and Technology     |
| INFED        | INFLIBNET Access Management Federation                                     |
| INFLIBNET    | Information and Library Network Centre                                     |
| IPR          | Intellectual property rights                                               |
| IR           | Institutional repository                                                   |
| IRINS        | Indian Research Information Network System                                 |
| ISBD         | International Standard Bibliographic Description                           |
| ISO          | International Organization for Standardization                             |
| KDD          | Knowledge discovery in databases                                           |
| KM           | Knowledge management                                                       |
| LIC          | Library and information centre                                             |
| LIS          | Library and Information Science                                            |
| LISA         | Library and Information Science Abstracts                                  |