

**Learning Outcomes based Curriculum Framework
(LOCF)**

For

**Master of Library & Information Science
(One Year Degree Programme)
w.e.f. Session 2022-23**



**Chaudhary Devi Lal University
Sirsa-125055, Haryana
2022**

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1. Learning Outcomes based Curriculum Framework

Learning outcome-based curriculum framework provides an opportunity for the students to choose courses from the prescribed courses comprising core, elective/minor or skill-based courses. The courses can be evaluated following the grading system, which is considered to be better than the conventional marks system. Grading system provides uniformity in the evaluation and computation of the Cumulative Grade Point Average (CGPA) based on student's performance in examinations which enables the student to move across institutions of higher learning. The uniformity in evaluation system also enables the potential employers in assessing the performance of the candidates.

2. Objectives of the Programme

The overall objectives of Master's degree programme in Library and Information Science (M.Lib.I.Sc.) are:

- (a) To provide students with learning experiences that help to instill deep interests in learning Library and Information Science; develop broad and balanced knowledge and understanding of fundamental concepts, principles, and theories related to Library and Information Science.
- (b) To equip students with skills essential to provide various library and information services using Information and Communication Technologies.
- (c) To instill in students, professional attitude and ethical values for providing library and information services.
- (d) To impart students with the knowledge and skill base that would enable them to undertake further studies in Library and Information Science and in related areas or in multidisciplinary areas that involve Library and Information Science and to help them develop a range of generic skills that are relevant to wage employment in Libraries and Information Centers and also for self-employment and to practice infopreneurship.

3. Programme Learning Outcomes (PLOs)

The programme learning outcomes relating to Master's degree in Library and Information Science (M.Lib.I.Sc.) may include the following:

- (a) Demonstrate in depth knowledge of the basic concepts, principles, theories and laws related with the field of Library and Information Science.
- (b) Demonstrate understanding of rationality and procedures of managing print and electronic resources in the library.
- (c) Apply skills in carrying out professional activities in the library and handle all kinds of information environment both of traditional and modern information environment.



- (d) Demonstrate knowledge, understanding and skills that offer job opportunities as librarians in university, college, school, public or special libraries/ institutes.
- (e) Demonstrate professional attitude through commitment for providing every user his/her document/information; ensuring every document/information its user; saving time of the user and enhancing use of reading material and user satisfaction through effective and efficient library services.
- (f) Demonstrate core values by honouring diversity and insuring inclusion by treating all students and colleagues with respect and dignity, showing respect for and sensitivity to gender, culture and religious differences; and challenging prejudice, biases and intolerance at the workplace etc. and displaying ethical integrity which involves honest behavior.

4. Programme Structure

Master of Library & Information Science (M.Lib.I.Sc.) - One year (Two semesters) degree programme is of 48 credits weightage consisting of Core Courses (CC), Discipline Specific Elective Courses (DSE), Skill Enhancement Courses (SEC) , Ability Enhancement Compulsory Courses (AECC) and Generic Elective Courses (GEC).

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Table 1: Course code and Title along with Credits details

Sr. No.	Course Code	Course Title	Credits		
			Theory	Practical	Total
Semester I					
1.	M.Lib.I.Sc./1/CC1	Information Processing and Retrieval	4	-	4
2.	M.Lib.I.Sc./1/CC2	ICT Applications in LIS: Theory	4	-	4
3.	M.Lib.I.Sc./1/CC3	ICT Applications in LIS: Practice	-	4	4
Choose any one from the following two papers					
4.	M.Lib.I.Sc./1/DSE1	Electronic Resource Management	4	-	4
5.	M.Lib.I.Sc./1/DSE2	Collection Development			
Choose any one from the following two papers					
6.	M.Lib.I.Sc./1/DSE3	Social Science Information Sources, Systems and Services	4	-	4
7.	M.Lib.I.Sc./1/DSE4	Biological Science Information Sources, Systems and Services			
8.	GEC1	Generic/ Open Elective (GE) Course (to be opted by the student)	4	-	4
Total			20	4	24
Semester II					
1.	M.Lib.I.Sc./2/CC4	Research Methods and Statistical Techniques	4	-	4
2.	M.Lib.I.Sc./2/CC5	Digital Libraries, Content Management and e-Learning Platforms	4	-	4
3.	M.Lib.I.Sc./2/AECC1	Information Communication and Policies	4	-	4
4.	M.Lib.I.Sc./2/SEC1	Technical Writing and Communication Skills	4	-	4
Choose any one from the following two papers					
5.	M.Lib.I.Sc./2/DSE5	Information Literacy	4	-	4
6.	M.Lib.I.Sc./2/DSE6	E-learning			
Choose any one from the following two papers					
7.	M.Lib.I.Sc./2/DSE7	Preservation and Conservation	4	-	4
8.	M.Lib.I.Sc./2/DSE8	Informetrics and Scientometrics			
Students may opt for the two above DSE papers at Sr. No. 5 to 8 or the Dissertation/ Project work given below					
9.		Dissertation/ Project Work	-	-	8
Total			24	-	24



Generic Elective (GE) courses:

Students have the choice to select one Generic Elective Course from other department(s).

Notes:

1. For one credit of theory, one hour of lecture will be delivered while for one credit of practical, two hours of laboratory work will be conducted, per week.
2. The evaluation of Theory Courses consists of Internal Assessment- 30 marks and Final Term Exam- 70 marks. The Internal Assessment consists of Mid-term exam-20 marks, Assignment-05 marks, and Attendance-05 marks.
3. The evaluation of Practical Courses (Final Term Exam- 100 marks) will be done by the External and Internal examiners. It consists of Experiment, Written part and Viva-voce etc.

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SEMESTER - I
M.Lib.I.Sc./1/CC1– Information Processing and Retrieval

Credits: 4

Lectures: 60

Duration of Exam.: 3 Hrs.

Max. Marks: 100

Final Term Exam.: 70

Internal Assessment: 30

Learning Outcomes: After studying this paper, students shall be able to:

- Comprehend the various dimensions of information documentation
- Understand the organization of information
- Know the components of information storage and retrieval system
- Learn about the optimization factors for information systems
- Know the current issues in information storage and retrieval

Note for the Paper Setter: The question paper will consist of Nine questions in all. The first question will be compulsory and will consist of Five short questions of 2 marks each covering the whole syllabus. In addition, Eight more questions will be set unit-wise comprising of two questions from each of the four units. The candidates are required to attempt Four more questions selecting at least one question from each unit.

Unit 1: Information Processing & Retrieval

- Information Processing: Meaning, concept, need and purpose
- Information Retrieval (IR): definitions, objectives, characteristics, components and functions.
- Indexing: meaning, need, purpose and historical development
- Types: pre-coordinate and post-coordinate indexing.
- Pre-coordinate indexing systems: brief outline of chain procedure, POPSI, PRECIS and keyword indexing; Post-coordinate indexing systems: Uniterm indexing.
- Citation indexing: meaning, importance, different citation indexes: Sheppard's Citations, SCI, SSCI; Auto indexing - techniques and methods.

Unit 2: Vocabulary Control and Controlled Vocabularies

- Vocabulary control: meaning and importance
- Controlled vocabularies: dictionary, subject heading lists, thesauri, thesauromat, classarius, indexing language
- Thesaurus construction techniques



- Case study – ERIC , INSPEC & Cranfield

Unit 3: IR models

- Concept of ranking
- Structural models
- Boolean model
- Probabilistic retrieval model
- Vector space model

Unit 4: Evaluation & Trends of IRS

- Evaluation criteria
- Design of evaluation programmes
- Steps of evaluation; evaluation experiments
- Trends in IRS: developments, searching and retrieval, full text retrieval, user interfaces, IR standards and protocols.

Recommended Books:

1. Atchison, J. & Alan G. A. *Thesaurus construction: a practical manual*. London: Aslib.
2. Chowdhry, G.G. (2003). *Introduction to modern information retrieval*. 2nd ed. London, Facet Publishing.
3. Ghosh, S.B. & Biswas, S.C. (1998). *Subject indexing systems: Concepts, methods and techniques*. Rev. ed. Calcutta: IASLIC.
4. Seetharama, S. (1997). *Information consolidation and repackaging*. New Delhi: ESS ESS.
5. Vickery, B.C. (1970). *Techniques of information retrieval*. London: Butterworths



M.Lib.I.Sc./1/CC2– ICT Applications in LIS: Theory

Credits: 4

Lectures: 60

Duration of Exam.: 3 Hrs.

Max. Marks: 100

Final Term Exam.: 70

Internal Assessment: 30

Learning Outcomes: After studying this paper, students shall be able to:

- Comprehend the understanding about implementation of library automation software and in achieving library security with the use of latest ICTs technique.
- Understand the use of communication and networking technologies
- Get the knowledge about database management, data ware housing, data mining and other artificial intelligence technologies

Note for the Paper Setter: The question paper will consists of Nine questions in all. The first question will be compulsory and will consist of Five short questions of 2 marks each covering the whole syllabus. In addition, Eight more questions will be set unit-wise comprising of two questions from each of the four units. The candidates are required to attempt Four more questions selecting at least one question from each unit.

Unit 1:Library Automation

- Planning, implementation and evaluation of library automation
- Automation of in-house operations: acquisition, cataloguing, circulation, serials control system, OPAC and its features, library management
- Library automation softwares: LIBSYS, SOUL and KOHA
- Library security technology: RFID, CCTV, biometrics

Unit 2: Database Management

- Database: concept, need and types
- DBMS: concept & features
- RDBMS: concept, definition, features and need
- Database design, development, evaluation, query language
- Database architecture and models

Unit 3:Data Communication Technology

- Data communication: concept, definition
- Internet connectivity: dialup, leased line, ISDN, wireless
- Protocols and standards: TCP/IP, FTP, HTTP, OSI
- Web servers and Internet security
- Use of social networking tools for library services: RSS, Podcasting, Blogs

Unit 4:Artificial Intelligence

- Artificial intelligence: concept, definition and features
- Expert systems: concept, definition and features



- Data warehousing
- Data mining

Recommended Books:

1. Ackermann, Ernest. (1995). *Learning to use the Internet: An introduction with examples and experiences*. New Delhi: BPB.
2. Chellis, James, Perkins, Charles & Strebe, Mathew (1997). *MCSE: Networking essential study guide*. New Delhi: BPB.
3. Chowdhury, G. G. & Chowdhury, Sudatta (2007). *Organizing information: From the shelf to the Web*. London: Facet.
4. Chowdhury, G. G. & Chowdhury, Sudatta. (2000) *Searching CD-ROM and online information sources*. London: Library Association.
5. Cooke, Alison. (2008). *A guide to finding quality information on the Internet: Selection and evaluation strategies*. 2nd ed. London: Facet.
6. Cooper, Michael D. (1996). *Design of library automation systems: File structures, data structures and tools*. New York: John Wiley.
7. Haravu, L. J. (2004). *Library automation design: Principles and practice*. New Delhi: Allied.
8. Falk, Bennett. (1995). *The Internet basic reference from A to Z*. Singapore: Tech. Pub.
9. Forouzan, Behrouz A, Coombs, Catherine & Fegan, Sophia Chung. (2000). *Data communication and networking* (2nd ed). New Delhi: Tata McGraw-Hill.
10. Kashyap, M. M. (1993). *Database system: Design and development*. New Delhi: Sterling.
11. Leon, Alexis & Leon, Mathews. (1993). *Fundamentals of IT*. Chennai: Leon TechWorld.
12. Panda, K. C. & Gautam, J. N. (1999). *Information technology on the cross road: From abacus to internet*. Agra: Y. K.
13. Pandian, M. Paul & Jambhekar, Ashok. (2001). *Internet for libraries and information centres*. New Delhi: Tata-McGraw Hill.
14. Patterson, Dan W. (2000). *Introduction to artificial intelligence and expert systems*. New Delhi: Prentice-Hall of India.

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M.Lib.I.Sc./1/CC3– ICT Applications in LIS: Practice

Credits: 4

Lectures: 60

Duration of Exam.: 3 Hrs.

Max. Marks: 100

Final Term Exam.: 70

Internal Assessment: 30

Learning Outcomes: After studying this paper, students shall be able to:

- Understand the practical aspects in designing and developing library database.
- Develop library website and blog.
- Have hand-on training on library automation software and data migration from one system to another system.

Note for the Paper Setter: The question paper will consist of Nine questions in all. The first question will be compulsory and will consist of Five short questions of 2 marks each covering the whole syllabus. In addition, Eight more questions will be set unit-wise comprising of two questions from each of the four units. The candidates are required to attempt Four more questions selecting at least one question from each unit.

Unit 1: Library Management Software

- Library management software- KOHA Installation
- Working with modules of KOHA and SOUL

Unit 2: Blog, Content Management

- Designing and developing library blog
- Content Management: Zoomla/ Drupal

Unit 3: Digital Library Practice

- Hands on practice of scanner, digital camera and OCR
- Hands on practice of DL creation using Greenstone

Unit 4: Website Designing and Navigational Tools

- Designing library websites (HTML/Dreamweaver/Weebly etc.)
- Image creation/editing using Paint/Photoshop/Office Picture Management Tools, etc.

Recommended Books:

1. Ackermann, Ernest. (1995). Learning to Use the Internet: An Introduction with Examples and Experiences. New Delhi: BPB.
2. Bradley, Phil. (2004). Advanced Internet Searcher's Handbook. Facet Publishing.
3. Chowdhury, G. G. and Chowdhury, Sudatta. (2000). Searching CD-ROM and Online Information Sources. London: Library Association.
4. Falk, Bennett. (1995). *The Internet Basic Reference from A to Z*. Singapore: Tech. Pub.



5. McCoy, John. (1996). *Mastering Web Design*. New Delhi: BPB.
6. Neelameghan, A. & Lalitha, S. K. (2001). *Tutor+: A Learning and Teaching Package on Hypertext Link Commands in WINISIS*. Bangalore: Sarada Ranganathan Endowment for Library Science.
7. Negus, Christopher. (2005). *Linux Bible*. New York: John Wiley.
8. Simpson, Alan. (2004). *Windows XP Bible*. New York: John Wiley, 2004.
9. Walkenbach, John, et al. (2007). *Office 2007 Bible*. New York: John Wiley.
10. Winship, Ian & McNab, Alison. (2000). *Student's Guide to the Internet*. London: Library Association.

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M.Lib.I.Sc./1/DSE1– Electronic Resource Management

Credits: 4

Lectures: 60

Duration of Exam: 3 Hrs.

Max. Marks: 100

Final Term Exam: 70

Internal Assessment: 30

Learning Outcomes: After studying this paper, students shall be able to:

- Understand the meaning, definition and types of electronic resources
- Know about the electronic resources and their life cycles
- Develop understanding about collection development of e-resources
- Learn the activities involved in developing collection and providing access to electronic resources

Note for the Paper Setter: The question paper will consist of Nine questions in all. The first question will be compulsory and will consist of Five short questions of 2 marks each covering the whole syllabus. In addition, Eight more questions will be set unit-wise comprising of two questions from each of the four units. The candidates are required to attempt Four more questions selecting at least one question from each unit.

Unit 1:Electronic Resources

- Electronic resources: concept, need, characteristics, benefits and drawbacks
- E-Resource life cycle
- Types of e-resources
- Electronic publishing

Unit 2:Collection Development

- Collection building process: formulating policy, budgeting, evaluation of e-resources, pricing, licensing, ordering and receiving
- Model licenses and guidelines
- Negotiation: concept and need
- Consortia: concept, need , purpose & limitations
- National consortia: Shodhsindhu

Unit 3:Access Management

- Access management of e-resources
- Authentication and Authorization
- Preventing misuse
- e-resource publicity
- Preservation of e-resources
- User training and awareness

Unit 4:Usage Statistics and ERMS

- Usage statistics of e-resources
- Standards and guidelines (COUNTER, SUSHI)



- ERMS: concept, need, features
- Salient features of some ERMS

Recommended Books:

1. Conger, Joan E. (2004). *Collaborative electronic resource management: From acquisitions to Assessment*. Westport: Libraries Unlimited.
2. Cole, Jim et. al. (2003). *E-serials Collection Management: Transition, Trends and Technicalities*. London: CRC Press.
3. Curtis, Donnelyn. (2005). *E-journals: How to do it Manual for Building, Managing and Supporting Electronic Journal Collection*. London: Facet Publishing.
4. Jones, Wayne, ed. (2009). *E-Journal Access and Management*. New York: Routledge.
5. Katz, Linda S. (2003). *Collection Development Policies: New Dimension for Changing Collections*. London: Routledge Kegan Paul.
6. Katz, Linda S. (2005). *Managing Digital Resources in Libraries*. London: Routledge Kegan Paul.
7. Kemp, Rebecca. (2008). *E-resource Evaluation and Usage Statistics: Selector's Choices*. Saarbrücken: VDM Verlag.
8. Lee, Stuart D. & Boyle, Frances. (2004). *Building an Electronic Resource Collection: A Practical Guide* (2nd ed). London: Facet Publishing.
9. Lee, Sul H. (2003). *Electronic Resources and Collection Development*. London: Routledge Kegan Paul.
10. Mitchell, Anne M & Surrat, Brain E. (2005). *Cataloguing and Organizing Digital Resources: A How to do it Manual for Librarians*. London: Facet Publishing.
11. Yu, Holly & Breivold, Scott. (2008). *Electronic Resource Management in Libraries: Research and Practice*. Information Science Reference.

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M.Lib.I.Sc./1/DSE2– Collection Development

Credits: 4

Lectures: 60

Duration of Exam.: 3 Hrs.

Max. Marks: 100

Final Term Exam.: 70

Internal Assessment: 30

Learning Outcomes: After studying this paper, students shall be able to:

- Know about the methods of materials acquisitions, covering various formats and library types
- Understand the bibliographic and evaluative support for collection development work
- Develop understanding about the issues surrounding collection development, including budgeting, policies, user communities, and collection management
- Know the expectations for and of selectors in an ever-evolving profession
- Develop skills to handle the real-life situations to tackle those collections development situations in workplace

Note for the Paper Setter: The question paper will consist of Nine questions in all. The first question will be compulsory and will consist of Five short questions of 2 marks each covering the whole syllabus. In addition, Eight more questions will be set unit-wise comprising of two questions from each of the four units. The candidates are required to attempt Four more questions selecting at least one question from each unit.

Unit 1: Collection Development Principles

- Collection development: concept; goals and methods
- Components of collection development
- Collection development policies: concepts and types
- Planning for collection development : committees; staffing; budgeting;
- Implementation and evaluation

Unit 2: Selection Principles and Tools

- Principles of selection- Ranganathan, Drury, Dewey
- Selection tools: concept, types,
- Selection tools for print resources
- Selection tools for e-resources
- Evaluation of selection tools

Unit 3: Developing Print Collection

- Collection development of print resources
- Building collection in a new library
- Selection of print resources
- Budget and Finance for collection development
- Stock verification and weeding out



Unit 4: Developing Collection of e-Resources

- Collection building process : formulating policy, budgeting, evaluation of e-resources, pricing, licensing, ordering and receiving
- Model licenses and guidelines
- Negotiation : concept and need
- Consortia : concept, need and purpose
- Collection building of e-resources through consortia
- National consortia in India: ShodhSindhu

Recommended Books:

1. Alabaster, Carol. (2002). *Developing an outstanding core Collection: A guide for libraries*. Chicago: American Library Association
2. Bonk, W. J., & Magrill, R.M. (1979). *Building library collections* (5th ed.). Metuchen, NJ: The Scarecrow Press
3. Cassell, M. K., & Greene, G.W. (1991). *Collection development in the small library: Small libraries Publications, no. 17*. Chicago: American Library Association
4. Evans, G. E. (1995). *Developing library and information center collections*, (3rd ed.): Library Science Text Series. Englewood, CO: Libraries Unlimited
5. Gabriel, M. R. (1995). *Collection Development and Collection Evaluation: A sourcebook*. Metuchen, NJ: The Scarecrow Press

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Credits: 4

Lectures: 60

Duration of Exam.: 3 Hrs.

Max. Marks: 100

Final Term Exam.: 70

Internal Assessment: 30

Learning Outcomes: After studying this paper, students shall be able to:

- Comprehend the understanding about evolution of social science as a discipline.
- Understand the growth and research trends of subject of social sciences.
- Learn about the systems and networks in social sciences.
- Know about the various institutions working towards the development of social sciences.
- Understand the databases and resources important for the social science community.

Note for the Paper Setter: The question paper will consist of Nine questions in all. The first question will be compulsory and will consist of Five short questions of 2 marks each covering the whole syllabus. In addition, Eight more questions will be set unit-wise comprising of two questions from each of the four units. The candidates are required to attempt Four more questions selecting at least one question from each unit.

Unit 1: Structure and Development of Social Sciences

- Social Science development and relation with other subjects
- Sociology: Definition, scope, landmarks and research trends
- Political Science: Definition, scope, landmarks and research trends
- Psychology: Definition, scope, landmarks and research trends
- Economics: Definition, scope, landmarks and research trends
- History: Definition, scope, landmarks and research trends
- Public Administration: Definition, scope, landmarks and research trends

Unit 2: Social Science Information Systems and Networks

- Information System: Concept and evaluation
- Information Associations in Social Sciences: International Political Science Association, International Sociological Association
- Information Networks in Social Sciences: SocioSite, Social Science Research Network (SSRN)
- Social Science Council and Committee: International Social Science Council (ISSC), International Committee for Social Science Information and (ICSSD)

Unit 3: Social Science Institutions at National and International Levels

- Indian Council of Social Science Research
- Indian Institute of Public Administration
- Tata Institute of Social Sciences



- Indian Council of Historical Research
- Centre for Policy Research
- Indian Council of World Affairs
- National Council for Applied Economic Research
- United Nation Educational Scientific and Cultural Organisation (UNESCO)

Unit 4: Databases in Social Sciences

- ProQuest.
- J-STOR.
- EBSCOhost.
- J-Gate.
- Population Information Online (POPLINE).
- Project Muse.
- UNESDOC Digital Library
- Shodhganga
- Networked Digit Library of Theses and Dissertations (NDLTD).
- IndiaStat
- UN Data.
- OpenDOAR (Directory of Open Access Repositories)
- DOAJ. (Directory of Open Access Journals)

Recommended Books:

1. Association of Librarians and Information Professionals in the Social Sciences. (2010). *Innovations in social sciences information and research support*. London: Association of Librarians and Information Professionals in the Social Sciences.
2. Harmon-Jones, E. &Winkelman, P. (2006). *Fundamentals of social science*. New York: Guilford.
3. Indian Association of Social Science Institutions. (2012). *National social science information system On-going and completed research projects in society related study area (2008-10)*. New Delhi: Indian Association Social Science Institutions.
4. British Library. (2006). *Social science search: the complete research service*. London: British Library.
5. Tyagi, K.G. & Johry, N. (Eds.). (2001). *Directory of social science libraries and information centres in India*. New Delhi: NASSDOC.
6. Fisher, David and Price, Sandra. (2018). *Information Sources in the Social Science*: Saur.

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M.Lib.I.Sc./1/DSE4– Biological Science Information Sources, Systems and Services

Credits: 4

Lectures: 60

Duration of Exam.: 3 Hrs.

Max. Marks: 100

Final Term Exam.: 70

Internal Assessment: 30

Learning Outcomes: After studying this paper, students shall be able to:

- Comprehend the understanding about evolution of biological science.
- Understand the growth and research trends of subject of biological sciences.
- Learn about the systems and services in biological sciences.
- Know about the various institutions working towards the development of biological sciences.
- Understand the databases and resources important for the biological science community

Note for the Paper Setter: The question paper will consist of Nine questions in all. The first question will be compulsory and will consist of Five short questions of 2 marks each covering the whole syllabus. In addition, Eight more questions will be set unit-wise comprising of two questions from each of the four units. The candidates are required to attempt Four more questions selecting at least one question from each unit.

Unit 1: Structure and Development of Biological Sciences

- Biological Science development and relation with other subjects
- Botany: Definition, scope, landmarks and research trends
- Zoology: Definition, scope, landmarks and research trends
- Biotechnology: Definition, scope, landmarks and research trends
- Microbiology: Definition, scope, landmarks and research trends
- Biochemistry: Definition, scope, landmarks and research trends

Unit 2: Information Systems and Services in Biological Science

- Information System: Concept and evaluation
- Information systems in biological science
- Reference and referral services in biological science
- Indexing and Abstracting service in biological science

Unit 3: Biological Science Institutions at National and International Levels

- Department of Science and Technology (DST)
- Department of Biotechnology (DBT)
- Centre for Cellular and Molecular Biology (CCMB)
- National Centre for Cell Science
- Institute of Genomics and Integrative Biology (IGIB)
- National Centre for Biotechnology Information (NCBI)



Unit 4: Information Sources and Databases in Biological Sciences

- Information sources in Biological Sciences
- Web of Science, Scopus
- ScienceDirect
- PubMed, IndMed
- Biosis, Medline
- Shodhganga
- Networked Digit Library of Theses and Dissertations (NDLTD).
- OpenDOAR (Directory of Open Access Repositories)
- DOAJ. (Directory of Open Access Journals)

Recommended Books:

1. Parker, C. C. (2014). Information Sources in Science and Technology: A Practical Guide to Traditional and Online Use. Butterworth-Heinemann.
2. Marks, R. J., II, Sanford, J. C., Behe, M. J., Dembski, W. A., & Gordon, B. L. (2013). Biological Information: New Perspectives - Proceedings of the Symposium (1st ed.). World Scientific Publishing Company.
3. Niiranen, S., & Ribeiro, A. (2013). Information Processing and Biological Systems (Intelligent Systems Reference Library, 11) (2011th ed.). Springer

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SEMESTER-II

M.Lib.I.Sc./2/CC4– Research Methods and Statistical Techniques

Credits: 4

Lectures: 60

Duration of Exam.: 3 Hrs.

Max. Marks: 100

Final Term Exam.: 70

Internal Assessment: 30

Learning Outcomes: After studying this paper, students shall be able to:

- Understand research and its importance.
- Understand the different methods and techniques of research.
- Know the use of data collection tools, organization and representation of data.
- Learn the different data analysis techniques.
- Know about how to prepare research report.

Note for the Paper Setter: The question paper will consist of Nine questions in all. The first question will be compulsory and will consist of Five short questions of 2 marks each covering the whole syllabus. In addition, Eight more questions will be set unit-wise comprising of two questions from each of the four units. The candidates are required to attempt Four more questions selecting at least one question from each unit.

Unit 1: Research Basics

- Research: definition, concept, objectives, types
- Types of Research: Basic, Applied, Action
- Identification and formulation of problem
- Literature search and review: purpose, objectives and style
- Research Proposal: how to write an effective research proposal

Unit 2: Research Design

- Research design: concept, need and purpose
- Research approach: qualitative - narrative, phenomenology, ethnography, discourse; quantitative-experimental and non-experimental (survey, historical, descriptive)
- Research objectives, questions and hypotheses: meaning, concept types and narrating style

Unit 3: Research Tools and Techniques

- Population and sample - concept, meaning and sampling techniques
- Data collection methods: questionnaire, schedule, interview, observation
- Library records and reports

Unit 4: Data Analysis, Interpretation & Reporting

- Data processing- analysis, interpretation, presentation: concept, need and purpose
- Descriptive statistics and inferential statistic
- Measures of central tendency: mean, median, mode
- Dispersion, correlations, linear Regression, standard deviation- non-parametric & parametric (chi-square test, t-test)



- SPSS and Web-based statistical analysis tools: basics
- Research report writing

Recommended Books:

1. Charles, Busha H. and Harter, Stephen P. (1980). *Research methods in librarianship: Techniques and Interpretations*. USA: Academic Press.
2. Fowler, Floyd J. (2001). *Survey research methods*. 3rd ed. California: Sage.
3. John W. Creswell (2013). *Research design: Qualitative, quantitative, and mixed methods approach*. 4th ed . New Delhi: Sage.
4. Kothari, C. R. (2004). *Research methodology: Methods and techniques*. 2nd rev ed. New Delhi: New Age.
5. Powell, Ronald R. & Connaway, Lynn Silipigni (2010). *Basic research methods for librarians*. 5th ed. New York: Libraries Unlimited.
6. Rao, I. K. Ravichandra (1983). *Quantitative methods in library and information science*. New Delhi: Wiley Eastern.

The image shows three handwritten signatures in blue ink at the bottom of the page. The first signature on the left is 'U Singh', the middle one is 'Rajeev', and the one on the right is 'Anand'.

M.Lib.I.Sc./2/CC5– Digital Libraries, Content Management and e-Learning Platforms

Credits: 4

Lectures: 60

Duration of Exam.: 3 Hrs.

Max. Marks: 100

Final Term Exam.: 70

Internal Assessment: 30

Learning Outcomes: After studying this paper, students shall be able to:

- Know the basic concepts related to digital library system.
- Explore the applications of software and standards in developing digital library systems.
- Understand the concept of digital library, digital resources, design and organization of digital library
- Understand the technologies involve in the building of digital libraries
- Familiarize with the concept of e-Content, content creation and its hosting platforms including Learning Management Systems and MOOCs
- Acquaint the file format, metadata standards, interoperability, and legal issues

Note for the Paper Setter: The question paper will consists of Nine questions in all. The first question will be compulsory and will consist of Five short questions of 2 marks each covering the whole syllabus. In addition, Eight more questions will be set unit-wise comprising of two questions from each of the four units. The candidates are required to attempt Four more questions selecting at least one question from each unit.

UNIT I: DIGITAL LIBRARIES

- Digital libraries: Definition, Objectives, Scope of Digital libraries
- Digital Resources: Nature, Characteristics and types
- Design and Organization of Digital Libraries - Architecture, Interoperability, Compatibility
- Digital library initiatives: National and International

UNIT II: CONTENT MANAGEMENT SYSTEM

- Content Management System (CMS): Concept, Definition and Scope
- CMS Tools
- Features and functionalities of its stakeholders
- Theoretical Framework of CMS
- Evaluation and selection criteria for CMS

UNIT III: E-LEARNING PLATFORMs (LMS & MOOCs)

- Learning Management System: Concept, need, features and functionalities



- LMS Tools
- Stakeholders and their role & responsibilities Modules / plugin of LMS
- MOOCs: Concept, features and functionalities
- Popular MOOCs platforms

UNIT IV: STANDARD, PROTOCOL AND LEGAL ISSUES

- File Formats and Character Encoding Standards: ASCII, ISCII, Unicode
- Interoperability Standards: OAI-PMH , OAI-ORE
- Metadata: Concept, Types, Metadata Standards: Dublin core, METS, MODS
- Legal Issues – Intellectual Property Rights (IPR), Copyright, Licensing

Recommended Readings

1. Alemu, G., Stevens, B. (2015). An Emergent Theory of Digital Library Metadata: Enrich Then Filter. Netherlands: Elsevier Science.
2. Andrews, J. (2017). Digital Libraries: Policy, Planning and Practice. United Kingdom: Taylor & Francis.
3. Banerjee, K., Reese, T. (2018). Building Digital Libraries: Second Edition. United States: American Library Association.
4. Blaney, J., Milligan, S., Steer, M., & Winters, J. (2021). Doing digital history: A beginner's guide to working with text as data. Manchester University Press.
5. Boczkowski, P. J. and Mitchelstein, E. (2021). The digital environment: How we live, learn, work and play now, MIT Press
6. Chowdhury, G.G. & Foo, Schubert. (2012). Digital Libraries and Information Access: Research Perspectives. London: facet publishing
7. Evans, W. & David B. (2013). A Handbook of Digital Library Economics: Operations
8. Frazier, A. (Eds.) (2017). Managing Digital Cultural Objects: Analysis, Discovery and Retrieval.
9. Fritz, A. I. (2021). Sustainable Enterprise Strategies for Optimizing Digital Stewardship: A Guide for Libraries, Archives, and Museums. Rowman & Littlefield.
10. Hughes, L. M. (2004). Digitizing Collections: strategic issues for the information manager. New York: Neal Schuman.
11. Lawson, N. (2018). Digital Library Preservation Strategies. United Kingdom: EDTECH.
12. Miller, S. J. (2014). Metadata for digital collections: A how-to-do-it manual. New York: Neal-Schuman
13. Oleck, J. (2012). Creating the digital library. New York: Primary Research Group, Inc.
14. Papy, Fabrice. (2016). Digital Libraries. London: ISTE Press
15. Pedley, P. (2009). Digital Copyright. 2nded. London: Facet Publishing.
16. Pomerantz, J. (2015). Metadata. Massachusetts: MIT Press
17. Purcell, A. D. (2016). Digital library programs for libraries and archives: Developing, managing, and sustaining unique digital collections. Massachusetts: MIT Press

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18. Tabakova, V. (2020). E-learning in medical physics and engineering: building educational modules with Moodle. CRC Press.
19. Tom Dieck, M. C. (2021). Augmented Reality and Virtual Reality: New Trends in Immersive Technology. Springer Nature.

4 rings deep



M.Lib.I.Sc./1/AECC1– Information Communication and Policies

Credits: 4
Lectures: 60
Duration of Exam.: 3 Hrs.

Max. Marks: 100
Final Term Exam.: 70
Internal Assessment: 30

Learning Outcomes: After studying this paper, students shall be able to:

- Know about the information and related concept
- Understand the various channels of communication
- Understand how freedom of information prevails in an advanced society to uphold a democracy
- Learn about information science as a discipline
- Understand different acts, commissions and policies related to information activities in India
- Comprehend the importance of information as a resource

Note for the Paper Setter: The question paper will consist of Nine questions in all. The first question will be compulsory and will consist of Five short questions of 2 marks each covering the whole syllabus. In addition, Eight more questions will be set unit-wise comprising of two questions from each of the four units. The candidates are required to attempt Four more questions selecting at least one question from each unit.

Unit 1: Information and Communication

- Information : definition, characteristics, nature, type, value and use
- Conceptual difference between data, information and knowledge
- Communication of information
- Communication channels, models and barriers

Unit 2: Information Science and Information Society

- Information science: definition, scope and objectives
- Information science as a discipline and its relationship with other subjects
- Information society: definition, genesis, characteristics and implications
- Changing role of library and information centres in society
- Knowledge society: definition, genesis, characteristics & implications

Unit 3: Information Laws/ Acts and Policies

- Freedom of information
- Fair use policies
- IPRs, Right to Information Act 2005, IT Act 2000
- International and National Programmes and Policies (NAPLIS)
- National Knowledge Commission (NKC)

Unit 4: Economics of Information and Knowledge Management

- Information as an economic resource
- Information as a commodity
- Information industry: generators, providers and intermediaries



- Marketing of information product and services
- Knowledge management

Recommended Books:

1. Feather, John (2008). *The information society: A study of continuity and change*. 5th ed. London: Facet.
2. Martin, William J. (1988). *The information society*. London: Aslib.
3. Raja Rammohan Roy Library Foundation and Indian Library Association (1985). *Documents of national policy on library and information system*. Calcutta: The Foundation.
4. Sharma, Pandey S. K., ed. (2003). *Electronic information environment and library services*. New Delhi: Indian Library Association.
5. Vickery, Brian C. & Vickery, Alina (1987). *Information science in theory and practice*. London: Butterworths.

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M.Lib.I.Sc./2/SEC1– Technical Writing and Communication Skills

Credits: 4

Lectures: 60

Duration of Exam.: 3 Hrs.

Max. Marks: 100

Final Term Exam.: 70

Internal Assessment: 30

Learning Outcomes: After studying this paper, students shall be able to:

- Understand the concept and importance of technical writing.
- Know the difference between general and technical writings.
- Learn about about writings with specific purpose.
- Understand the different forms of oral presentation.
- Comprehend the benefits and demerits of seminar, group discussion and other form of oral presentation.

Note for the Paper Setter: The question paper will consists of Nine questions in all. The first question will be compulsory and will consist of Five short questions of 2 marks each covering the whole syllabus. In addition, Eight more questions will be set unit-wise comprising of two questions from each of the four units. The candidates are required to attempt Four more questions selecting at least one question from each unit.

Unit 1: Technical Writing

- Technical & non-technical writings: meaning , definition and difference
- Forms of technical writings: theses, technical papers, reviews, manuals
- Parts of theses: objectives & sequence
- Citation Style: objectives, style manuals
- APA documentation: note taking, listing sources: references and bibliography
- APA style (In-text: superscription and parenthetical)

Unit 2: Specific Documents

- Private and official correspondence: important characteristics
- Workplace letters: guidelines, parts, formats and design; audience and purpose; letter tone- polite, tactful, plain English and ethical consideration
- Resume, interview and resignation

Unit 3: Writing Process

- Writing process: objectives, purpose, context, language and tone
- Grammar and usage: parts of speech

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- Mechanics of writing: abbreviation, hyphenation, capitalization, use of numbers, spelling & punctuations
- Editing and proof reading: basics of editing and proofreading marks

Unit 4: Oral Communication

- Oral communication: objectives, advantages , pitfalls and avoidance
- Considerations: languages , diction, sentence structure and thematic wind up
- Personal presentation: seminar, extempore; personal interview; story telling
- Group presentation: group discussion, brainstorming session

Recommended Books:

1. *Chicago Manual of Styles*. 16th ed. New Delhi: Prentice Hall of India, 2010.
2. Gilbadi, Joseph. *MLA handbook for writers of research papers*. 7th ed. New Delhi: Affiliated East- West Press, 2010.
3. Gordon, H. M. and Walter J. A. *Technical writing*. 5th ed. London: Holt, 1986.
4. Hornby, A. S. *Oxford Advanced Learners Dictionary of Current English*. 8th ed. New Delhi: Oxford University Press, 2009.
5. James, H. S. *Handbook of technical writing*. NTC Business Books, 2010.
6. Mohan, K. *Speaking english effectively*. New Delhi: Macmillan, 2005.
7. Richard, W. S. *Technical writing*. New York: Barnes and Noble, 2008.
8. Lannon, John M. (1997). *Technical writing*. 7th ed. New York: Longman.
9. Lannon, John M. & Gurak, Laura J. (2014). *Technical communication*. 3rd ed. Boston: Pearson.
10. Basu, B. N. (2007). *Technical writing*. New Delhi: Prentice Hall of India.

The image shows three handwritten signatures in blue ink. The first signature on the left is 'U Singh', the middle one is 'Deep', and the one on the right is 'Anya'.

M.Lib.I.Sc./2/DSE5– Information Literacy

Credits: 4

Lectures: 60

Duration of Exam.: 3 Hrs.

Max. Marks: 100

Final Term Exam.: 70

Internal Assessment: 30

Learning Outcomes: After studying this paper, students shall be able to:

- Know about concept and scope of Information Literacy.
- Develop new skills for design of Information Literacy Programmes.
- Create and promote Information Literacy Programmes.

Note for the Paper Setter: The question paper will consist of Nine questions in all. The first question will be compulsory and will consist of Five short questions of 2 marks each covering the whole syllabus. In addition, Eight more questions will be set unit-wise comprising of two questions from each of the four units. The candidates are required to attempt Four more questions selecting at least one question from each unit.

Unit1: Information Literacy

- Information literacy: concept, definition, scope and importance
- Components of information literacy
- Library 2.0 and information literacy
- Standards of information literacy
- Information literacy and lifelong learning

Unit2: Information Literacy Programmes

- Scope of information literacy programme
- Components of information literacy programmes
- National programmes in information literacy
- International programmes in information literacy

Unit3: Methodology of Information Literacy

- Information literacy products: library brochure, database brochure, web-based
- Planning and designing of information literacy programme
- Implementation of information literacy programmes



Unit4: Media Literacy

- Media literacy: concept, need, scope
- Characteristics of traditional and new media
- Locating and analyzing the sources of information
- Evaluation of information media

Recommended Books:

1. Andretta, S. (2012). *Ways of experiencing information literacy: Making the case for a relational approach*. Oxford: Chandos.
2. Godwin, P & Parker, J. (2009). *Information literacy meets library 2.0*. Santa Barbara: Facet.
3. Mackey, T.P & Jacobson, T.E. (2011). *Teaching information literacy online*. London: Neal-Schuman.

The image shows three handwritten signatures in blue ink at the bottom of the page. The first signature on the left is 'U Singh', the middle one is 'Deep', and the one on the right is 'Anya'.

M.Lib.I.Sc./2/DSE6– E-learning

Credits: 4

Lectures: 60

Duration of Exam.: 3 Hrs.

Max. Marks: 100

Final Term Exam.: 70

Internal Assessment: 30

Learning Outcomes: After studying this paper, students shall be able to:

- Know about the relevant, pedagogically sound educational materials and programs for the Internet using the latest developments in online educational theories and technology.
- Understand a variety of multimedia technology tools to develop engaging, effective e-learning.
- Learn the components of effective e-learning instructional design, development, implementation, and evaluation to creating projects and programs that meet the immediate classroom needs and goals

Note for the Paper Setter: The question paper will consist of Nine questions in all. The first question will be compulsory and will consist of Five short questions of 2 marks each covering the whole syllabus. In addition, Eight more questions will be set unit-wise comprising of two questions from each of the four units. The candidates are required to attempt Four more questions selecting at least one question from each unit.

Unit 1: Learning process and E-learning

- Learning: meaning, definition, concept
- Learning process, Learning theories
- Bloom's Taxonomy
- E-learning: meaning, definition and concept
- Learning with technology

Unit 2: Basics of E-learning

- E-learning instructional design
- Six C's framework of e-learning
- Computer-mediated communication
- Asynchronous and Synchronous learning
- Virtual Reality, Augmented Reality, Mixed Reality
- M-learning



Unit 3: E-learning tools and platforms

- E-learning tools
- Tools for developing e-content
- Learning Management System (LMS): Concept, importance
- The four quadrant approach
- Features of LMS: Moodle, Google Classroom, etc.

Unit 4: Initiatives of E-learning

- Indian initiatives: SWAYAM, EPGpathshala, NDL, etc.
- International initiatives
- Role of international bodies in e-learning: UNESCO, etc.
- Digital divide and e-learning

Recommended Books:

1. Allen, Michael. (2003) *Michael Allen's guide to e-learning: Building interactive, fun, and effective learning programs for any company*. New Jersey: Wiley.
2. Arshavskiy, Marina (2013). *Instructional design for e-learning: Essential guide to creating successful e-learning courses*. London: Create Space.
3. Haythornthwaite, Caroline & Andrews, Richard (2011). *E-learning: Theory and practice*. London: Sage.
4. Khan, Badrul (2005). *Managing e-learning strategies: design, delivery and implementation and evaluation*. Pteorshey: Information Science Publishing.

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M.Lib.I.Sc./1/DSE7– Preservation and Conservation

Credits: 4
Lectures: 60
Duration of Exam.: 3 Hrs.

Max. Marks: 100
Final Term Exam.: 70
Internal Assessment: 30

Learning Outcomes: After studying this paper, students shall be able to:

- Know the ways to examine the various components of a preservation program and will be able to differentiate between conservation and preservation of library materials.
- Identify various factors of deterioration of library materials.
- Design effective security and disaster planning program.
- Assess strategies for devising a mission statement and developing a preservation policy.
- analyze the methods for selecting collections for preservation and assessing institution's preservation needs

Note for the Paper Setter: The question paper will consist of Nine questions in all. The first question will be compulsory and will consist of Five short questions of 2 marks each covering the whole syllabus. In addition, Eight more questions will be set unit-wise comprising of two questions from each of the four units. The candidates are required to attempt Four more questions selecting at least one question from each unit.

Unit 1 Introduction

- Introduction to concepts of archiving, preservation and conservation.
- Need and significance of
- Archiving, preservation and conservation of information resources.
- Evolution of writing materials: clay, papyrus, metallic plates, skin, parchment, vellum, palm leaves; history, nature, use as writing materials and their preservation. history of paper making, different types of paper and their nature.

Unit 2 Materials

- Different types of library materials, their preservation and maintenance: paper based materials
- Book and non Book materials, library binding, binding standards.
- Other materials: Magnetic plates, tapes & diskettes, microforms, optical media, magneto optical discs.

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Unit 3 Hazards and Safeguard

- Hazards to library materials and their preservation: environmental hazards, biological hazards and human being as an enemy of library materials; disaster prevention and recovery.
- To study various national archival initiatives of different countries: NARA of US, Australian
- National initiatives, public archives of Canada

Unit 4 Digitization and record management

- Records management: concepts and issues involved
- Electronic resource management; code of Ethics for archivists.
- Digital preservation

Recommended Books:

1. Balloffet, N., Hille, J., & Reed, J. A. (2005). *Preservation and conservation for libraries and archives*. Chicago: American Library Association.
2. Henderson, K. L. (1983). *Conserving and preserving library materials*. Urbana-Champaign, Ill.: University of Illinois, Graduate School of Library and Information Science.
3. Johnson, P. (2009). *Fundamentals of collection development and management*, 2nd ed. Chicago: American Library Association

The image shows three handwritten signatures in blue ink at the bottom of the page. The first signature on the left is 'U Singh', the middle one is 'Dipak', and the one on the right is 'Anand'.

M.Lib.I.Sc./2/DSE8– Informetrics and Scientometrics

Credits: 4

Lectures: 60

Duration of Exam.: 3 Hrs.

Max. Marks: 100

Final Term Exam.: 70

Internal Assessment: 30

Learning Outcomes: After studying this paper, students shall be able to:

- Become familiar with the fundamentals of Bibliometrics, Scientometrics, Informetrics and Webometrics
- Understand the bibliometrics laws.
- Know the statistical techniques in mapping of literature
- Learn the use of tools and software for scientometric analysis
- Know about various data sources including citation indexes, like Web of Science, SCOPUS, Google Scholar and search and retrieve useful information for conducting studies

Note for the Paper Setter: The question paper will consist of Nine questions in all. The first question will be compulsory and will consist of Five short questions of 2 marks each covering the whole syllabus. In addition, Eight more questions will be set unit-wise comprising of two questions from each of the four units. The candidates are required to attempt Four more questions selecting at least one question from each unit.

UNIT I: Introduction to Bibliometrics, Scientometrics, and Informetrics and related Laws

- Concept and Definition of Librametrics, Bibliometrics, Scientometrics, Informetrics, Webometrics and Altmetrics.
- Theoretical foundation of Bibliometrics and Scientometrics; Limitations of Bibliometrics, Scientometrics, Informetrics and Webometrics
- Classical laws of Bibliometrics - Bradford's Law, Zipf's Law, Lotka's Law, Brookes, Leimkhler, Bookstein Formulation, Bradford-Zipf Distribution; Price Theory, Ortega Hypothesis.
- Garfield's Law of Concentration, Mathew effect, Other models of Scientific Communications

UNIT II: Evaluative Bibliometrics

- Theoretical foundations of Citation Analysis – Merton's Normative Frameworks, Social Constructivist Theory, Cronin's Micro-sociological view and other views.
- Historical Perspectives of Evaluative Bibliometrics



- Publication productivity dynamics - Journal level, Institutional level, Regional level, National level, Global level, Discipline level publication
- Research Collaboration Dynamics-Individual, Institution, Regional, National and Global level.

UNIT III: Bibliometrics/ Scientometrics Indicators and Emerging Trends

- Bibliometric data sources: Scopus, Web of Science, Google Scholar; Crossref; Microsoft academic
- Bibliometric Data Collection: Citation counting methods.
- Journal citation measures - Journal impact factor, Journal Citation Indicator, Immediacy index, CiteScore, SNIP, Weighted Impact -Eigenfactor, SJR; Half-life; Normalized Impact Indicators
- Individual Impact measures-H-Index, g-index, etc; Co-Citation Analysis, Bibliographic coupling.

UNIT IV: Advanced learning in Bibliometrics/ Scientometrics

- Scientometrics Analysis Tools- R Software -Bibliometrix, Publish or Perish, Bibexcel, etc.;
- Network Visualization Software – Vosviewer; Pajek, Sci²Tools, CiteSpace, etc
- Altmetrics and Webometric data source and Analysis
- Responsible Research Metrics – DORA declaration, Leiden Manifesto, etc.

Recommended Readings

1. Bornmann, L., & Daniel, H. D. (2008). What do citation counts measure? a review of studies on citing behavior. *Journal of Documentation*, 64(1), 45 – 80.
2. Cronin, B. & Sugimoto, C. (Eds). (2014) Beyond Bibliometrics : Harnessing Multidimensional Indicators of Scholarly Impact. Massachussets, MIT Press
3. Cronin, B. (1984). The citation process: the role and significance of citations in scientific communication: Taylor Graham.
4. Cronin, B., & Atkins, H.B. (Eds.). (2000). The Web of Knowledge: A Festschrift in Honor of Eugene Garfield: Information Today Inc.
5. Egghe, L. (2005). Power Laws in the Information Production Process: LotkaianInformetrics: Emerald Group Publishing Limited.
6. Glänzel, W., Moed, H.F., Schmoch, U., Thelwall, M. (Eds.) (2019) Springer Handbook of Science and Technology Indicators. Cham, Switzerland: Springer Nature
7. Moed, H. F. (2005). *Citation analysis in research evaluation*. Dordrecht,:Springer.
8. Sugimoto, C. R. (Ed.)(2016), *Theories of Informetrics and Scholarly Communication: A festschrift in honor of Blaise Cronin*

The image shows three handwritten signatures in blue ink. The first signature on the left is 'U Singh', the middle one is 'D. Singh', and the one on the right is 'S. Singh'.

9. Thelwall, M. (2016). Web indicators for research evaluation: A practical guide. Synthesis Lectures on Information Concepts, Retrieval, and Services. San Rafael, CA: Morgan & Claypool Publishers.
10. Vinkler, P. (2010). The Evaluation of Research by Scientometric Indicators. Oxford: Chandos.
11. Waltman, L. (2016). A review of the literature on citation impact indicators. *Journal of Informetrics*, 10(2), 365–391. <https://doi.org/10.1016/j.joi.2016.02.007>.
12. Wilsdon, J. (2016), Towards Metric Tide: Independent Review of the Role of Metrics in Research Assessment and Management, Sage publication/ HEFCE, UK

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