LBSC 671: Creating Information Infrastructures
Online -- Fall 2017

Instructor

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Office Hours

I am happy to chat via email, phone, Skype, or other means of your choosing. Please email me to set up a specific time. I check my email throughout the day and will definitely be available after 5 pm EST weekdays and from 9 am till 5 pm EST on weekends. However, please know I will work with you and your schedule to find a time to meet if needed.

Course Description

Course Prefix and Number: LBSC 671
Course Title: Creating Information Infrastructures
Credits: 3
Section: Online
First day of class: August 28, 2017
Last day of class: December 11, 2017

Creating Information Infrastructures introduces students to the foundations of acquiring and managing collections, information structures, indexing and discovery systems in Library and Information Studies. The course introduces theoretical concepts, trends, systems, and technologies central to this area of the field and equips students with the skills and conceptual background to create and manage information systems and services. The course is centered on the exploration of library and archival information systems, with students working to create, index, and produce their own objects and descriptive metadata for physical and digital contexts. In order to introduce students to the broad world of information institutions, how they manage resources and provide access for their users the course is broken into four thematic areas:

- **Terms of reference**: What are information institutions, and in what social context do they exist?
- **Get it**: What kinds of resources do information institutions manage, and how do they come to have them?
- **Find it**: How do institutions manage these resources, what conceptual and functional skills are required for this work, and what benefits and limitations exist for each approach (e.g., automated vs. manual)
• **Serve it**: How do information institutions provide access to these resources in physical and Web-based settings

A central goal of the course is to develop student proficiency that will support their graduate work in the remaining core and elective classes.

**Student Learning Outcomes**

1. Demonstrate mastery of concepts, models and information structures for life-cycle management of information assets by libraries, archives, and schools.
2. Demonstrate knowledge of the capabilities and limitations of current methods for acquisition, preservation, management, discovery and delivery of information in physical and digital form.
3. Demonstrate proficiency in creating and applying models, schema, representations and encodings for organizing information.
4. Demonstrate proficiency in designing and implementing information services that leverage current technologies.
5. Demonstrate familiarity with the effects of current trends in information creation, information technology, and information use on methods for acquisition, preservation, organization, management, discovery, and delivery of information.

**Class Website and Communications**

The course will be taught entirely through ELMS, UMD’s online course management system. All lectures, readings, discussions, and assignments will be accessible through the course website, which should appear when you log into ELMS. If you have difficulty navigating or using any of ELMS’s features, a tutorial is available: [https://myelms.umd.edu/courses/1157772](https://myelms.umd.edu/courses/1157772)

In order to communicate with each other, we will use the discussion boards features on ELMS. There will be a general “Announcements” area for important reminders and notifications. There will also be a discussion board for questions or concerns and separate boards for each module. If necessary, you may also receive emails from me ([madull@gmail.com](mailto:madull@gmail.com)).

**Expectations for Students**

If you require accommodation(s) due to a disability registered with ADS ([Accessibility & Disability Service](https://umanitoba.ca/ads)), please email me so we can work with them to ensure access to the course content. If you will be absent for medical or religious reasons, please let me know as soon as possible so any necessary adjustments can be made. As someone who also completed an online MLIS, I understand that you are all living lives outside of ELMS or campus and that Things Happen. Absences due to emergencies or other circumstances will be addressed on a case-by-case basis.
Assignments must be submitted via ELMS. Late assignments will be reduced by a half point for each day late (e.g., if you submit a reflection paper a day late, your max score will be 4.5/5). **If you are experiencing extenuating circumstances, please contact me as soon as possible.**

Please familiarize yourself with the University’s Code of Academic Integrity ([https://www_president.umd.edu/administration/policies/section-iii-academic-affairs/iii-100a](https://www_president.umd.edu/administration/policies/section-iii-academic-affairs/iii-100a)). Academic dishonesty, including cheating, fabrication, facilitating academic dishonesty, will not be tolerated.

**Modules Overview**

This course will draw heavily from Erik Mitchell’s *Metadata standards and web services in libraries, archives, and museums* (Libraries Unlimited, 2015). This text is freely available via the UMD ebook collections ([https://umaryland.on.worldcat.org/oclc/922581516](https://umaryland.on.worldcat.org/oclc/922581516)) or may be purchased in print (ISBN 9781610694490). All other readings will be made available on the page for each module and will be a mix of materials either available via the UMD libraries’ collections or freely available on the web.

Each module will feature a short lecture or series of lectures on the topic at hand. These lectures will be posted by the start of each module. I am creating new content for this course and will do my best to make the lectures available as soon as I can so that you may work ahead if you choose. Each module will also include an activity sheet – usually short exercises or other ways to explore the topics presented in the module. You should work through these activities and discuss what you discovered/challenges/new ideas generated in the discussion boards.

**Assignments and Grading**

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**Total Points: 100**
Module 1 (8/28-9/3) – Information Infrastructures and Institutions

Class Overview:
Introduce the structure for the semester grounded in a broad orientation to how information institutions work. Explore definitions and examples of information institutions including galleries, libraries, archives, and museums (GLAMs). Explore the roles that these institutions play in society (e.g. memory, community, education, commerce).

Readings:
- Watch: What happens when you click a link https://www.youtube.com/watch?v=keo0dglCj7I#t=47

Optional Readings:

Activities:
- Review the syllabus and the course website.
- Complete the readings.
- Watch the course welcome video and Module 1 video (on ELMS).
- Participate in the discussion forum.

Assignments:
Course Introduction Survey.
Module 2 (9/4-9/10) – Information Systems as Boundary Objects

Class Overview:
Expand on the organizational orientation from Module 1 and discuss social and cultural roles of GLAMs. Explore concrete examples of information, cultural heritage and memory institutions and define concepts and ideas to give students a holistic understanding of “information infrastructure” field.

Readings:
- “Do We Really Need Libraries?” – Linton Weeks for NPR in May 2015. [http://www.npr.org/sections/npr-history-dept/2015/05/05/403529103/do-we-really-need-libraries](http://www.npr.org/sections/npr-history-dept/2015/05/05/403529103/do-we-really-need-libraries)
- Explore: DDC Digital Curation Lifecycle Model: [http://www.dcc.ac.uk/resources/curation-lifecycle-model](http://www.dcc.ac.uk/resources/curation-lifecycle-model)

Optional Readings:
- Bohyun Kim’s blog post on “Suzanne Briet’s Document Antelope in Celebration of Ada Lovelace Day”. [http://www.bohyunkim.net/blog/archives/2622#.WZhm8ih97IU](http://www.bohyunkim.net/blog/archives/2622#.WZhm8ih97IU)

Activities:
- Complete the readings.
- Watch the Module 2 video.
- Participate in the discussion forum.
- W3Schools HTML Tutorial ([https://www.w3schools.com/html/](https://www.w3schools.com/html/))

Assignments:
Reflection Paper #1 due 9/10.
Module 3 (9/11-9/17) – Acquiring and Managing Resources

Class Overview:
Explore resource acquisition and management work in GLAMs. Introduce technical service and illustrate connections with other functional areas in information institutions by reinforcing role of core courses. For each GLAMs institution type explore the notion of resource operations in light of changing information institution models. At the end of the class students will understand the role of each of the activities in GLAMs 1) Publication models (formal, in-formal), 2) Acquisition of materials (published, manuscripts, grey literature), 3) Management of formats (physical and digital), 4) Materials processing and management, 5) Appraisal, access and preservation, 6) Alternative acquisition, management and dissemination strategies.

Readings:

- [Read Introduction, Literature review, Skim remainder of the article] Cynthia K. Sauer, Doing the Best We Can? The Use of Collection Development Policies and Cooperative Collecting Activities at Manuscript Repositories, American Archivist 64(2)308-349, 2001. https://doi.org/10.17723/aarc.64.2.gj6771215231xm37

Activities:

- Complete the readings.
- Watch the Module 3 video.
- Participate in the discussion forum.
- Activity Worksheet.

Assignments:
None due, but this might be a good time to look at Codecademy and your Programming Assignment.
Module 4 (9/18-9/24) – Introduction to Metadata

Class Overview:
Introduce metadata model (cataloging model, metadata schema, data representation model, data encoding/serialization). Discuss different types of metadata (e.g. descriptive, administrative, technical) and situate metadata within the broader context of information system design.

Readings:

- Gilliand, A.J. (2016). Setting the Stage. From Introduction to Metadata, 3rd ed. Edited by Murtha Baca. [http://www.getty.edu/publications/intrometadata/setting-the-stage/] [This entire text is quite good, so feel free to browse and read whatever else is of interest]
- [Read/skim sections 1-5]
- [Read/Skim]

Optional Readings:


Activities:

- Complete the readings.
- Watch the Module 4 video.
- Participate in the discussion forum.
- Activity Worksheet.

Assignments:

Module 5 (9/25-10/1) – Methods of Description, Representation and Classification

Class Overview:
Discuss cataloging methods and different forms of metadata in information institutions. Introduce concepts of metadata schemas and the role that metadata standards play in enabling creation of digital documents and representations. Reinforce specific cataloging standards/approaches (e.g., RDA and DACS) and introduce metadata schema (e.g., MARC, DC, EAD). Reinforce context of these standards in broader metadata and information system design models. Draw connections to other information systems. Explore and application classifications structures.

Readings:

Optional Readings:
- Introduction to the Dewey Decimal Classification: http://www.oclc.org/content/dam/oclc/dewey/versions/print/intro.pdf
- Library of Congress Classification Outline: https://www.loc.gov/catdir/cpso/lcco/
- Understanding MARC (Bibliographic MAchine Readable Cataloging): https://www.loc.gov/marc/umb/
- BIBFRAME 2.0: https://www.loc.gov/bibframe/docs/bibframe2-model.html

Activities:
- Complete the readings.
- Watch the Module 5 video.
- Participate in the discussion forum.
- Activity Worksheet.

Assignments:
Nothing due.
Module 6 (10/2-10/8) – Metadata Schema, Vocabularies, and Encoding

Class Overview:
Expand on concepts in metadata schema including the notion of application profiles, abstract models and Resource Description Framework. Broaden student understanding of vocabularies by introducing new serialization standards (e.g. XML, JSON).

Readings:

- After reading the above, watch: [http://www.youtube.com/watch?v=AbzOLua2baw](http://www.youtube.com/watch?v=AbzOLua2baw)

Optional Readings:


Activities:

- Complete the readings.
- Watch the Module 6 video.
- Participate in the discussion forum.
- Activity Worksheet.

Assignments:

Reflection Paper #3 due on 10/8.
Module 7 (10/9-10/15) – Database Design

Class Overview:
Introduce relational database design concepts and techniques. Reframe student understanding of information systems by introducing web-based information system design (e.g. Model – View – Controller). Topics covered include entity relationship modeling, database creation, database querying and information filtering.

Readings:


Optional Readings:

- W3Schools (2013). Introduction to SQL. http://www.w3schools.com/sql/sql_intro.asp

Activities:

- Complete the readings.
- Watch the Module 7 video.
- Participate in the discussion forum.
- Activity Worksheet.

Assignments:

Start thinking about your capstone project selection.
Module 8 (10/16-10/22) – Deep Dive into Final Projects and Programming Assignment

Class Overview:
Student exploration of their final project topics and working on the Programming Assignment if you haven’t yet.

Readings:
The readings this week are whatever you need to read as you explore your potential capstone projects.

Activities:
- Watch video reviewing capstone selections.
- Watch video briefly describing digital library creations and ViewShare.
- Select the focus of your final project and perform your own "Deep Dive" into content. This may involve learning a technical skill, reading up on a trend or information infrastructure theory or collecting data for research, or digging into ViewShare.
- This is a good week to dive into the programming assignment as well - estimated time to complete is 13 hours.

Assignments:
Reflection Paper #4 and Capstone Project Selection due on 10/22
Module 9 (10/23-10/29) – Search and Retrieval in Information Systems

Class Overview:
Explore methods for automatic indexing and ranking of information resources. Introduce foundation of web search techniques, full text searching of scanned books and image searching.

Readings:
- Watch: Google’s “How Search Works”: https://www.youtube.com/watch?v=BNHR6IqJGZs
- Watch: Google’s “The Evolution of Search”: https://www.youtube.com/watch?v=mTBShtwCnD4

Optional Readings:
- Explore: http://www.wikidata.org/wiki/Wikidata:Main_Page

Activities:
- Complete the readings.
- Watch the Module 9 video.
- Participate in the discussion forum.
- Activity Worksheet.

Assignments:
Nothing due. But did you do your Programming Assignment yet?
Module 10 (10/30-11/5) – Resource Dissemination, Access, and Use

Class Overview:
Explore services that support access to physical and digital objects. Introduce broad types of information services including user-focused services (library catalog) and system-focused web- services (interoperability, harvesting, transformation) (ONIX, OAI/PHM).

Readings:


Optional Readings:


Activities:

- Complete the readings.
- Watch the Module 10 video.
- Participate in the discussion forum.
- Activity Worksheet.

Assignments:

Reflection Paper #5 due on 11/5.
Module 11 (11/6-11/12) – Metadata-rich Web Services

Class Overview:
Continue exploring metadata rich web services.

Readings:
- Explore: http://linkeddatatools.com/

Optional Readings:
Our guest lecturer, Eric Hanson, may assign or provide additional readings to accompany the video. They will be posted to ELMS as soon as they are available.

Activities:
- Complete the readings.
- Watch the Guest Lecture presentation, by Eric Hanson (Digital Content Metadata Librarian at the Sheridan Libraries, Johns Hopkins University).
- Participate in the discussion forum.
- Activity Worksheet.

Assignments:
Capstone Project Update due 11/12.
Module 12 (11/13-11/19) – Building Blocks of the Web

Class Overview:
Revisit web-publishing document standards (e.g. HTML, CSS, JavaScript). Acquaint students at a high level with web publishing approaches.

Readings:

- How to Publish Web Pages Using Your TerpConnect Account: [https://umd.service-now.com/itsc?id=kb_article&sys_id=78160fe33790020041271f9543990e57](https://umd.service-now.com/itsc?id=kb_article&sys_id=78160fe33790020041271f9543990e57)

Optional Readings:

- Watch: Uploading Files to Terconnect with WinSCP: [https://www.youtube.com/watch?v=3uLLKveCJec](https://www.youtube.com/watch?v=3uLLKveCJec)

Activities:

- Complete the readings.
- Watch the Module 12 video.
- Participate in the discussion forum.
- Activity Worksheet.

Assignments:

Reflection Paper #6 due on 11/19.
Thanksgiving Break (11/20-11/26)

Module 13 (11/27-12/3) – Exploration of Data Management

Class Overview:
In this class we are exploring the broad area of Research Data Management in order to better understand how issues of organization and information technology have an impact in an emerging area of interest in libraries, archives, schools and museums. Students will explore a real-world data management guide and try their hand at data management tools.

Readings:

- Read: Data Science/Data Scientist Definitions. [https://drive.google.com/a/berkeley.edu/file/d/0B210UTUXO1YdbkFmTzZ2dWZBTms/edit?usp=sharing](https://drive.google.com/a/berkeley.edu/file/d/0B210UTUXO1YdbkFmTzZ2dWZBTms/edit?usp=sharing)

Activities:

- Complete the readings.
- Watch the Module 13 video.
- Participate in the discussion forum.
- Work on your capstone projects.

Assignments:

Capstone Project due on 12/3.
Module 14 (12/4-12/10) – Next Steps in Information Infrastructures

Class Overview:
Expand on concepts in metadata schema including the notion of application profiles, abstract models (e.g. Dublin Core Abstract Model) and Resource Description Framework. Broaden student understanding of vocabularies by introducing new serialization standards (e.g. XML, JSON).

Readings:

Activities:
- Complete the readings.
- Watch the Module 14 video.
- Participate in the discussion forum.
- Work on your final reflection paper.

Assignments:
Cumulative Reflection Paper due on 12/10.

Last chance to turn in your Programming Assignment on 12/10.
Assignment Details

Course Participation
(Required for each module. Worth 25 points or approximately 1.7 points per module)
Each module will include a discussion board to allow you and your fellow students to discuss the readings, lectures, related issues and events, etc. Please set aside time for each module to participate in the discussions, which I hope will allow you all to grow and learn together.

This grade is based on participation in online discussion. As such you should post at least three times each week, once in the first few days, once in the middle of the week and once at the end. Posts do not in themselves need to be long rather you should ask provoking questions, answer questions when you know the answer and help out your fellow students when they need it.

Reflection Papers
(6 biweekly worth 5 points each (30 points total) and 1 Cumulative Reflection Paper worth 15 points)
Every other week you will be asked to reflect on your work through the course. The biweekly Reflection Papers should be approximately 1 page (1” margins, single-spaced, 12-point font). Prompts for each paper will be provided.

Your Cumulative Reflection paper should be approximately 3 pages (1” margins, single-spaced, 12-point font) and should look back on the entirety of the course.

Deliverables:
Each biweekly Reflection will be a single Word document or PDF, approximately 1 page long uploaded to ELMS. The Cumulative Reflection will be a single Word document or PDF, approximately 3 pages long uploaded to ELMS.

Grading Guidelines:
Papers will be evaluated on general clarity and coherence and well as your ability to demonstrate a synthesis of the course materials.

Course Capstone Project
(Project Selection and Project Update are worth 2 points each (4 total). Final deliverable is worth 15 points).
Please select ONE capstone project to complete. Although the specific project can be selected by you and does not need to absolutely fit one of the projects below, it should meet or exceed the elements of one of the suggested projects.

All projects will be prefaced by two check-in assignments. The Project Selection assignment will be a short survey in ELMS where you indicate which project you will be working on and its scope. The Project Update will be a short paragraph that you will upload to ELMS.
Option 1 – Research paper

Your research paper may touch on your experiences in the course or may be informed by an external interest you have related to information infrastructures (e.g., resources, technologies, standards, lifecycles, communities). Ultimately you should use your paper to explore issues of information infrastructure trends and in libraries, archives, schools and museums in depth and include an original literature review/analysis and original thought. The paper should include 5 academic sources that were not part of the regular course readings and should be at least 8 double spaced pages long (with 1” margins and a 12-point font). It may be helpful to break your paper into four sections (Introduction/Problem statement, Literature review, Analysis/discussion, Conclusion)

Deliverables:
- Project Selection
- Project Update
- A 8+ page paper (double spaced) uploaded to ELMS

Grading Guidelines:
- Paper meets 8-page length and 5 source requirements.
- Paper explores issues of information infrastructure trends and in libraries, archives, schools and museums in depth and includes original literature review/analysis and original thought.
- Paper is well written and connects resources cited to original ideas.

Option 2 - Digital Library Creation

This assignment spans the course of the semester and is drawn from the skills and conceptual foundation that we develop in each class. You will create a digital collection, moving through the metadata model design, resource cataloging and resource publishing process using ViewShare, a hosted digital library platform offered by the Library of Congress.

This may be an individual or group assignment. Students who work in groups must provide a commensurate number of digital objects in the collection (7 per person, so a group of 3 should have at least 21 objects). Each group member should submit the Project Selection and Project Update assignment, but you can submit one final ViewShare library and video.

This assignment includes five separate processes. Each of these steps is facilitated by the ViewShare platform.
- **Topic/content selection:** You should identify a topic or content area for your digital library. It should be large enough and of common interest to the group.
- **User needs assessment:** You should identify potential users and use goals of your site (e.g., discovery, research, contribution). Create a short statement that explains what information needs a typical user of your collection would have and use it to guide your creation of metadata and interface needs.
- **Metadata modeling:** You should use the skills you have learned this semester to evaluate your digital collection and select metadata elements that will help you describe your digital objects. The metadata model must include descriptive elements (e.g. title, creator, publication date), employ a categorization or classification system (e.g. LCSH, DDC, TGN, or your own developed
categorization system) and must include one metadata element that allows you to leverage a visualization feature in ViewShare (e.g. Date timeline, geographic or pie chart.

- **Data loading / cataloging:** Using the CSV option, create and load ViewShare data. You should have 10 digital objects (per person if in a group) to ensure a robust ViewShare library. While this process may be confusing and ambiguous you should watch instructional videos, use templates and ask questions of your professor and classmates.

- **Interface design:** Your interface design needs to include at least one advanced “View” (e.g. Map, Timeline, scatter plot, or pie chart), include a search widget, and a list or tag cloud widget. Your interface should include a collection overview and be designed to leverage metadata. In addition, you should explore and experiment with the design features of Viewshare and consider the use of metadata labels, sorting and other features.

To create your library, you will need to register for an account here: [http://viewshare.org](http://viewshare.org). Review the “Getting Started” information, which includes a User Guide and information on importing and generating views of your collection: [https://viewshare.uservoice.com/knowledgebase/articles/248044-getting-started](https://viewshare.uservoice.com/knowledgebase/articles/248044-getting-started)

**Deliverables:**
- Project Selection
- Project Update
- A unified Viewshare library that features a specific collection of digital objects that have been cataloged and presented using available Viewshare tools. The digital library should contain at least seven items cataloged per person (if working in a group).
- A video presentation of around 2-3 minutes that provides a quick overview of the digital library content, conducts a tour of notable features of the digital library (e.g. visualizations, metadata features, interface elements) and discusses the challenges associated with developing the digital library.

**Grading guidelines:**

**ViewShare Library:**
- Does your DL contain sufficient number of digital objects?
- Is the metadata model selected appropriate to the collection? Is the metadata of high quality (e.g. Metadata loaded fits model and interface requirements)
- Does the interface contain at least one advanced view, one search widget, one subject/browsing widget and one collection context widget?
- Did your interface take advantage of the metadata model?
- Did your interface include additional contextual features (e.g. sidebars, narrative statements, etc.) that give context to your digital library?
- Does your interface reflect an exploration of design features?

**Video Presentation:**
- Inclusion of tour of platform, discussion of challenges and surprises, discussion of metadata model and interface features.
Option 3 – Create your own website

Leveraging the HTML and CSS skills learned in this class, create a website. You should create a website with a specific purpose in mind. For example, you may want to create a website that shows off photos from a trip you took, showcases recipes and pictures of dishes you create or serves as a personal/professional homepage.

The website should consist of at least 3 separate pages, employ use of content (e.g. headers, paragraph content, links to internal and external sites), media (e.g. images, embedded media, linked videos), and have a focused use case and platform (e.g., my user is someone who wants to view recipes on their mobile phone). The website should employ semantic/xhtml techniques as outlined in our course documents, use CSS for styling and may make use of JavaScript or other advanced technologies if desired (note: JavaScript is optional). The use of template-based layout sites like Wix.com or sites.google.com are not acceptable for this assignment.

Deliverables:
- Project Selection
- Project Update
- URL to the website you created
- A 1-2 paged paper or short video describing the project and reflecting on your experience.

Grading Guidelines:
Website:
- Consists of at least 3 separate pages.
- Employs use of content (e.g., headers, links to other sites).
- Employs use of media.
- Demonstrates a focused use case and platform.

Paper or video:
- Discusses all relevant features of the website.
- Reflects on the use case for the website.
- Reflects on the process of building the website.

Programming Exploration:
(Due at the end of the course, but may be handed in at any time. Worth 10 points.)
In this assignment students learn more about programming and data manipulation using Python or JavaScript. This assignment is largely self-led and involves completing either the Python (recommended) or JavaScript Codeacademy course as well as a reflective statement about the process.
[NOTE: If you have already completed this Codeacademy course prior to class or if you know Python and JavaScript you should choose another programming activity at Codeacademy or somewhere similar. Please clear this with me prior to working on it.]

Instructions:
- Go to https://www.coursera.org/learn/learn-python
  https://www.coursera.org/learn/learn-javascript
- Create an account.
- Complete the course (10-13 hours of work).
- Upload the completed certificate to ELMS.

Deliverables:
- Course Completion Survey where you can upload a screenshot of how far you got in the course.
- Short reflective statement on the process.

Grading Guidelines:
- Course completion (Up to 6 points)
  - 33% complete = 2 point
  - 66% complete = 4 points
  - 100% complete = 6 points
- Reflective statement (4 points)

Acknowledgements
The overarching structure of this course is drawn from a previous version designed by Erik Mitchell. Thanks to Elizabeth De Coster (Towson University) for her feedback.