LIS-S 530: Makerspaces in Learning Environments

Department of Library and Information Science
Indiana University School of Informatics and Computing
Indianapolis
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Section No.:   11137
Credit Hours: 3
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Prerequisites: LIS-S 500 and LIS-S 501
Instruction mode: This course is offered online only

COURSE DESCRIPTION

This course covers makerspaces and making activities to support inquiry-driven and community learning in information institutions. Resources, facilitation, and learning around communities and practices of making are examined. Students gain hands-on experience with digital and physical making toolkits and design and develop a makerspace-related learning environment within an information institution.

EXTENDED COURSE DESCRIPTION

The Maker Movement is increasingly drawing excitement from libraries as it provides resources (i.e., making toolkits, fabrication tools) and facilitation (i.e., mentors, peers, experts) that promote inquiry-driven learning and community engagement. This course surveys the historical roots of makerspace and the current landscape of digital and physical making toolkits with hands-on experience to consider how the practices of the maker movement can be implemented in your personal or professional information institution. This class is designed to serve as an introduction to the ethos and the culture of the maker movement with the hope that you may be motivated to continue the design and development of makerspace learning programs and environments in your own field.

This course will strive to create a community of learners in which everyone can facilitate one another to actively co-construct knowledge. Towards that end, this course leverages on three components to guide our learning as a community of learners: 1) personal blog where you share your reading reflection and design reflection with your group, 2) group discussion and feedback, and 3) immersion and reflection through design projects. You will be asked to read,

synthesize, and critique readings that are assigned and create a blog post. The blog will document your personal learning journey. In your blog cohort group, you will share feedback, questions, and criticisms with other students. Lastly, a visit to a makerspace of your choice and four design projects will serve to immerse yourself to critically evaluate the potential and the challenges of implementing making toolkits and activities to promote inquiry-driven learning and community engagement.

Readings/Resources

This class does not require a textbook. Instead, this class **requires** all students to purchase a **LilyPad Starter Kit** available <u>here</u>.

The following books will be highly used:

Peppler, K., Halverson, E., & Kafai, Y. B. (2016). *Makeology: Makerspaces as learning environments* (Volume 1). Routledge.

Lee, V. R., & Phillips, A. L. (Eds.). (2018). *Reconceptualizing libraries: Perspectives from the information and learning sciences*. Routledge.

Additional readings will be available on the Canvas or university databases: <u>IUPUI</u> <u>Main Library database A-Z list</u> (iupui.campusguides.com/az.php)

We will also use a variety of library resources: <u>IUPUI Main Library</u> (ulib.iupui.edu)

Student should already have mastered basic technology skills. For students lacking entry skills, existing online resources can be valuable. IUPUI provides access to excellent online tutorials. The following resources are recommended for course assignments, exercises, and projects:

- For self-instructional modules focusing on a wide range of basic technology skills, go to <u>UITS IT Training</u> (iu.edu/explore-topics/show-all/index.html)
- For additional software training materials, go to <u>UITS IT Training: Skillsoft</u> (iu.edu/skillsoft/)

Useful resources

- <u>MakerEd</u>:   Models of successful making programs in varied settings
- <u>MakerDirectory.com</u>: Maker online directory lists national and international maker events
- <u>Hackerspaces</u>:   Events and resources specific to hackerspaces
- <u>Maker Faire</u>:   Upcoming national and international maker faires
- <u>Makerspace</u>:   Connect and exchange makerspace projects and ideas (registration required)
- <u>Connected learning</u>: Learning guides and toolkits to support connected learning

Technology Requirements

Internet and computer access are required. Your Internet speed should sufficiently support uploading and downloading large file sizes. Your computer should be up-to-date with the latest operating system to support the required applications listed below; it should also have anti-virus software.

Internet access. High-quality internet connection is required. Cable Modem, DSL, ISDN or other high speed, broadband service is strongly recommended. Dial-up modems, while usable, will result in frustrating results during "live" conferencing or other multimedia activities. Using wireless connection when the signal is weak will cause similar frustrating results. Because this is a web-based class, students must have daily, reliable, high-speed Internet access.

Basic computing requirements. Students need to have access to a properly functioning computer throughout the semester that meet the following requirements:

- Unless otherwise noted, most modern computers have enough processing power (i.e., RAM) for this course
- The use of a tablet or mobile device will not give you all the functionality needed for the course; do not rely on such devices for a successful learning experience
- A current word processing software, such as the latest version of Word or Pages
    - Reminder: many software downloads are free to students here
- Webcam for synchronous web conferencing sessions and/or video presentations
- Student computers need to be capable of running the latest versions of plug-ins, recent software and have the necessary tools to be kept free of viruses and spyware

You have three sources for software: IUware, IUanyWare, Office 365

- **IUware (https://iuware.iu.edu/)** allows students, faculty, and staff to download software at no charge. See: What is IUware? https://kb.iu.edu/d/agze
- **IUanyWare (https://uits.iu.edu/iuanyware)** uses a web browser or mobile app to run certain IU-licensed software applications without your needing to install them on your device. See What is IUanyWare https://kb.iu.edu/d/bbbr (Note: You will be asked to download and install Citrix Receiver the first time you use the full service.)
- **Office 365 (https://uits.iu.edu/office365)** is a subscription-based service free to all IU currently enrolled students that provides multiple options for accessing the newest versions of Microsoft Office. See About Microsoft Office 365 at IU (https://kb.iu.edu/d/bexq)

For more details, see How to get university-licensed software at IU? (https://kb.iu.edu/d/aclo)

Canvas
The learning management system, Canvas, will be an integral part of the course. If you have

problems accessing Canvas, please contact the University Information Technology Services (UITS) Support Center at 317-274-HELP. All course announcements will be found in Canvas along with the class syllabus, course schedule, exercises for grade, practice exercises, and other course documents.

Teaching and Learning Methods

Active learning (AL), project-based learning (PBL), and asynchronous use of Canvas.

ASSESSMENTS

Assessments Details

Each student should not only read the assigned material but also arrive at a competent understanding of it prior to assessment. These measures will be used to assess student-learning outcomes:

1. ***Blog posts*** assess student's synthesis and evaluation of key course concepts.
2. ***Group discussions and feedback*** assess student's synthesis and evaluation of different perspectives and support co-construction of knowledge in this course.
3. ***Makerspace Immersion Report*** contextualizes student's readings with real-world problems and challenges and assesses student's understanding of key course concepts.
4. ***Mind maps*** visualize change in student's conceptualization of learning and its relation to making.
5. ***Design projects*** assess student's skills acquisition and application of course concepts to an authentic information institution setting.

Grade Allocation

Assessment	Total Percentage of Grade
Introduce Yourself! Video:	2%
Blog posts (×9):	18%
Group discussion and feedback (×13):	13%
Makerspace Immersion Report:	15%
Design project 1: Problem statement and preliminary ideas:	12%
Design project 2: Persona or scenario:	12%
Design project 3: Test report:	12%
Design project 4: Virtual presentation via Kaltura:	12%
Mind map (×2):	4%

Learning Outcomes

Upon completion of this course, students will	RBT	PGPL	PLO	Assessment*
1. Understand and analyze the historical roots of makerspace and constructionist learning	2, 4	1	1	B1, G1, B2, G2, M1
2. Use and analyze the current landscape of digital and physical making toolkits	3, 4	1	2, 7	B3, G3, B4, G4
3. Analyze and evaluate the learning practices and facilitation around different making toolkit(s) and activities	4, 5	1	2, 7	B5, G5, B6, G6, B7, G7
4. Analyze and evaluate the potential and the challenges of implementing making toolkits and activities to promote inquiry-driven learning and community engagement	4, 5	1, 3	2, 7	B8, G8, B10, G10, MIR
5. Create a makerspace-related learning environment targeted at your information institution	6	1, 2, 3	2, 7	B9, G9, M, B10, G10, D1, D2, G11, G12
6. Evaluate and re-iterate the design of your makerspace learning environment to promote inquiry-driven learning and community engagement	5, 6	1, 2, 3	2, 6, 7	D3, D4, G13, M1, M2

*   B-Blog Post; G-Group Discussion and Feedback; MIR-Makerspace Immersion Report; D-Design Project; M-Mind Map

Revised Bloom's Taxonomy (RBT)

1. **Knowledge/Remembering:** The ability to recall or recognize specific information or data.
2. **Understanding:** Understanding the meaning of informational materials, translation, interpolation and interpretation of instructions and problems.
3. **Application:** The use of previously learned information in new and concrete situations to solve problems that have single or best answers.
4. **Analysis:** Breaks down information/concepts into smaller components. Each component is identified and understood as is the relationship of these components to the whole.
5. **Evaluation:** The ability to apply a criterion or set of standards to conclude a value judgment.
6. **Creation, Synthesis:** The ability to merge knowledge into creating a new meaning or structure including demonstrating how and why various diverse elements work together.

Principles of Graduate and Professional Learning (PGPL)

Learning outcomes are assessed in the following areas:

1. Demonstrate the knowledge and skills needed to meet disciplinary standards of performance, as stated for each individual degree
2. Communicate effectively with their peers, their clientele, and the public
3. Think critically and creatively to improve practice in their field
4. Meet all ethical standards established for the discipline

Program Learning Outcomes (PLO)

1. **Approach Professional Issues with Understanding**
   - Understand the social, political, ethical, and legal aspects of information creation, access, ownership, service, and communication
   - Anticipate emerging trends and respond proactively
2. **Assist and Educate Users**
   - Analyze and identify the information needs of diverse communities of users
   - Educate users and potential users to locate, use, and evaluate information resources and tools
   - Analyze and evaluate information systems and services in a variety of settings
3. **Develop and Manage Collections of Information Resources**
   - Design and apply policies and procedures that support the selection and acquisition of information resources for particular communities of users
   - Manage, evaluate, and preserve physical and virtual collections of information resources
   - Uphold ethical and legal standards in acquiring, leasing, preserving, and providing access to information resources
4. **Manage and Lead Libraries and Other Information Organizations**
   - Perform basic managerial functions, including planning, budgeting, and performance evaluation
   - Communicate effectively to a variety of audiences
5. **Apply theories of organizational behavior and structure**
   - Represent and Organize Information Resources
   - Understand and apply principles of representation and organization
6. **Use Research Effectively**
   - Design, conduct, interpret, and take action based upon research and evaluation
7. **Deploy Information Technologies in Effective and Innovative Ways**

- Implement and evaluate information and communication technologies for efficiency, usability, and value to users

Assessment Rubric for the Blog Post

A rubric to assess blog posts which constitute 18% of the students' grade is provided here. Complete details about the assessment for each assignment will be provided in the course site.

Criteria	Ratings				Points
Completeness	1 point Assignment contains all required reflective and visual components, if specified, and is within the time parameters.	0.5 points Assignment is within the time parameters but does not contain all required reflective or visual components, if specified.	0 points Assignment is over the allocated time requirement, and/or does not contain all required reflections or other components, such as visuals, if specified.		0–1
Reflective quality	2 points Critical Reflection (Synthesizes reading materials by engaging in reflective skepticism; questions assumptions; sees connections that are not obvious; demonstrates an awareness that actions and events are	1.5 points Dialogic Reflection (description of events and synthesis of literature with a personal dialogue that involves questioning and considering alterative perspectives without an attempt to critically question and	1 point Descriptive Reflection (description of events or simple report of literature that includes rationales, but in a descriptive fashion; recognizes alternative explanations but does not analyze)	0 points Technical or descriptive discussion (description of events or simple report of literature without reflection)	0–2

	influenced by sociocultural contexts; the student's personal opinions are well supported by appropriate literature in an analytical fashion)	examine assumptions or alternatives)			
Grammar/ Citations	1 point There are no apparent grammar mistakes. All work from other sources is credited using in-line APA citations.	0.5 points A few grammar mistakes are made, none of which impede reading comprehension. A few errors were made in in-line citations or works cited, but all outside sources were still credited clearly.	0 points Reading comprehension is significantly impeded by grammar mistakes. Significant errors in citations prevented giving sufficient credit to outside sources, or citations were missing entirely.		0–1

* The rubric was made possible by referencing [Bloom's Digital Taxonomy](#) and [Models for Assessing Reflection](#).

COURSE DESIGN

This course is designed with assignments to evaluate your performance and ensure that you are keeping up. Some of the assignments will be minor but several will require more careful preparation and accumulated knowledge. Instructions will be provided for every assignment via Modules in Canvas.

In your blog posts, you are required to include at least two citations from the reading list. Use APA style for all your writing and citation. For design projects, you are required to include visual media (i.e. images or videos) that illustrate your in-progress design work including, but not limited to, idea sketches, visualizations, photos and videos of your products.

The syllabus indicates what we cover for a particular Module period and what is due during the period. You can "hand in" any work early if you are done, of course, but work handed in early is considered ready to be graded unless otherwise specified or arranged.

All assignments are due at 11:59 pm EST on the days indicated.

Logistics

Use the Modules page to quickly get to instructions.

How to Submit Assignments

Assignments will be submitted using the Canvas Assignment component. Please note the due date indicated. Not all due dates fall into a predictable pattern although the submission deadline is always 11:59 pm EST on those dates.

File Backups: You are responsible for maintaining your digital files for this class. Extensions will not be given for the loss of digital files. You must backup all your class files to your own external hard drive, USB drive, and/or a cloud storage device.

- The file back-up choice is yours to make, but I do recommend that you use the file backup service Box at IU.
- While you can use Box at IU for class files, Box (like all other cloud services) is NOT to be used for identifiable human subjects data or other restricted-access files.

COURSE OVERVIEW

Module 0

Introductions

Module 1

Overview of the Course; Introduction to How People Learn

- Introduction
  - Course logistics
  - Review of syllabus and assignments
- Introduction to how people learn and the notion of connected learning.
  - Explore differences in learning among young children, children, tweens, teens, adults, and seniors

Assignment:

- Introduce Yourself! (via YouseeU)
- Read the readings and the lecture
- Mind map: student's conceptualization of learning and making
- Blog post of reading reflection (500 words)
  - Provide a reflection on the week's readings related to the theoretical and methodological approaches and arguments, learning practices, your perspectives on why the work is (or is not) important to the field, potential discussion questions for the group, and a key take-away for yourself
- Discuss and provide feedback to all members in your blog cohort group (150 words)

Readings:

- National Academies of Sciences, Engineering, and Medicine. (2018). How people learn II: Learners, contexts, and cultures. Washington, DC: National Academies Press. https://doi.org/10.17226/24783
  - Required: Summary (pp. 1-9), Chapter 2 Context and Culture (pp. 21-33),
- National Research Council. (2009). Learning science in informal environments: People, places, and pursuits. Washington, D.C.: National Academies Press. https://doi.org/10.17226/12190
  - Chapter 4 Everyday and Family Learning (pp. 93-126), and Chapter 4 Designed Settings (pp. 127-172)

- Ito, M., Gutiérrez, K., Livingstone, S., Penuel, B., Rhodes, J., Salen, K., ... & Watkins, S. C. (2013). Connected learning: An agenda for research and design. Digital Media and Learning Research Hub.

Module 2

The Maker Movement and the Maker Mindset

- An overview of the advent and development of makerspaces
  - A survey of historical roots of makerspace, FabLabs, DIY and hobbyist learning.
- What is Maker Mindset?
- Introduction to theories of learning related to making

Assignment:

- Read the readings and the lecture
- Blog post of reading reflection (500 words)
  - Provide a reflection on the week's readings related to the theoretical and methodological approaches and arguments, learning practices, your perspectives on why the work is (or is not) important to the field, potential discussion questions for the group, and a key take-away for yourself
- Discuss and provide feedback to all members in your blog cohort group (150 words)

Readings:

- Dougherty, D. (2013). The maker mindset. In Design, make, play (pp. 25-29). Routledge.
- Worsley, M., & Blikstein, P. (2016). Children are not hackers: Building a culture of powerful ideas, deep learning, and equity in the Maker Movement. In Makeology (pp. 78-94). Routledge.
- Blikstein, P. (2013). Digital fabrication and 'making' in education: The democratization of invention. FabLabs: Of machines, makers and inventors, 4, 1-21.
- Papert, S., & Harel, I. (1991). Situating constructionism. Constructionism, 36(2), 1-11.
- Halverson, E. R., & Sheridan, K. (2014). The maker movement in education. Harvard educational review, 84(4), 495-504.
- Martin, L., & DIXON, C. (2016). Making as a pathway to engineering. *Makeology: Makers as learners*, *2*, 183.
- Brahms, L., & Crowley, K. (2016). Making sense of making: Defining learning practices in MAKE magazine. Makeology: Makers as learners, 2, 13-28.
- Bevan, B. (2017). The promise and the promises of Making in science education. Studies in Science Education, 53(1), 75-103.
- Vossoughi, S., & Bevan, B. (2014). Making and tinkering: A review of the literature. *National Research Council Committee on Out of School Time STEM*, 1-55.

Making Toolkits and Activities (Part 1)

Module 3

Digital Toolkits and Low-Tech Making

- Explore, use, and analyze digital toolkits and low-tech making

Assignment:

- Readings and lecture
- Watch tutorial and make your own game using Scratch
- Find 3 more examples of low-tech making or digital toolkit
- Blog post (500 words) of design reflection and an overview of examples
    - Reflect upon your design experience of creating a Scratch game to describe the learning process and practices
    - Provide an overview of three low-tech making or digital toolkit examples with videos or images with personal critique of each example, potential discussion questions for the group, and a key take-away for yourself
- Discuss and provide feedback to two members in your blog cohort group (150 words)

Readings:

- Qi, J., & Buechley, L. (2014, April). Sketching in circuits: designing and building electronics on paper. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (pp. 1713-1722). ACM.
- Peppler, K., Halverson, E., & Kafai, Y. B. (2016). From a Movie to a Movement: Caine's Arcade and the Imagination Foundation Mike McGalliard. In *Makeology* (pp. 125-138). Routledge.
- Fields, D. A., Giang, M., & Kafai, Y. (2014, November). Programming in the wild: trends in youth computational participation in the online scratch community. In *Proceedings of the 9th workshop in primary and secondary computing education* (pp. 2-11). ACM.
- Peppler, K. A., & Kafai, Y. B. (2007). From SuperGoo to Scratch: Exploring creative digital media production in informal learning. *Learning, media and technology*, *32*(2), 149-166.

Module 4

Tangible Design and Physical Computing

- Explore, use, and analyze tangible design and physical computing

Assignment:

- Readings and lecture
- Watch tutorial and use your purchased LilyPad Arduino Kit to design something
- Blog post (500 words) of your design experience
  - Document the LilyPad design that you created by images or videos
  - Describe the design process and reflect upon the challenges and pitfalls and how you overcome them, potential discussion questions for the group, and a key take-away for yourself
- Discuss and provide feedback to two members in your blog cohort group (150 words)

Readings:

- Buechley, L., & Eisenberg, M. (2008). The LilyPad Arduino: Toward wearable engineering for everyone . IEEE Pervasive Computing, 7(2), 12-15.
- Searle, K. A., Fields, D. A., & Kafai, Y. B. (2016). Is sewing a "girl's sport"? Addressing gender issues in making with electronic textiles. Makeology: Makers as learners, 72-84.
- Bender, S. (2016). Electronics meets textiles: Sewing the way to powerful new ideas about technology. In Makeology (pp. 139-158). Routledge.
- Peppler, K. Y. L. I. E. (2016). ReMaking arts education through physical computing. Makeology: Makerspaces as learning environments, 2, 206-225.
- Rogers, Y., Paay, J., Brereton, M., Vaisutis, K. L., Marsden, G., & Vetere, F. (2014, April). Never too old: engaging retired people inventing the future with MaKey MaKey. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (pp. 3913-3922). ACM.
- Lee, E., Kafai, Y. B., Vasudevan, V., & Davis, R. L. (2014). Playing in the arcade: Designing tangible interfaces with MaKey MaKey for Scratch games. In Playful user interfaces (pp. 277-292). Springer, Singapore.

Making Toolkits and Activities (Part 2)

Module 5

Makerspaces in Informal Learning Environments

- Analyze and evaluate the resources, facilitation, and learning around communities and practices of museum-based and community-based makerspaces

Assignment:

- Read the readings and the lecture
- Blog post of reading reflection (500 words)
  - Provide a reflection on the week's readings related to the theoretical and methodological approaches and arguments, learning practices, your perspectives

on why the work is (or is not) important to the field, potential discussion questions for the group, and a key take-away for yourself
- Discuss and provide feedback to all members in your blog cohort group (150 words)

Readings:

- Brahms, L., & Crowley, K. (2016). Learning to make in the museum. Makeology: Makerspaces as learning environments, Routledge, New York, 15-29.
- Sheridan, K. M., & Konopasky, A. (2016). Designing for resourcefulness. *Makeology: Makerspaces as learning environments*, *1*, 30.
- Roque, R. (2016). Family creative learning. *Makeology: Makerspaces as learning environments*, *1*, 47-63.
- Sheridan, K., Halverson, E. R., Litts, B., Brahms, L., Jacobs-Priebe, L., & Owens, T. (2014). Learning in the making: A comparative case study of three makerspaces . Harvard Educational Review, 84(4), 505-531.

Module 6

Makerspaces in Libraries

- Analyze and evaluate the resources, facilitation, and learning around communities and practices of library-based makerspaces

Assignment:

- Read the readings and the lecture
- Blog post of reading reflection (500 words)
  - Provide a reflection on the week's readings related to the theoretical and methodological approaches and arguments, learning practices, your perspectives on why the work is (or is not) important to the field, potential discussion questions for the group, and a key take-away for yourself
- Discuss and provide feedback to all members in your blog cohort group (150 words)

Readings:

- Koh, K., Abbas, J., & Willett, R. (2018). Makerspaces in Libraries: Social Roles and Community Engagement. In Reconceptualizing Libraries (pp. 17-36). Routledge.
- Kafai, Y., Telhan, O., Davis, R. L., Steele, K., & Adleberg, B. (2018). Making Connected Messages: Designing Community-Relevant Murals with Youth in Public Libraries. In Reconceptualizing Libraries (pp. 39-55). Routledge.
- Tzou, C., Bell, P., Bang, M., Kuver, R., Twito, A., & Braun, A. (2018). Building Expansive Family STEAM Programming Through Participatory Design Research. In Reconceptualizing Libraries (pp. 39-55). Routledge.

Module 7

Makerspaces in Formal Learning Environments

- Analyze and evaluate the resources, facilitation, and learning around communities and practices of makerspaces in formal learning environments from Pre-K to higher education settings

Assignment:

- Read the readings and the lecture
- Blog post of reading reflection (500 words)
    - Provide a reflection on the week's readings related to the theoretical and methodological approaches and arguments, learning practices, your perspectives on why the work is (or is not) important to the field, potential discussion questions for the group, and a key take-away for yourself
- Discuss and provide feedback to all members in your blog cohort group (150 words)

Readings:

- Wohlwend, K., Keune, A., & Peppler, K. (2016). Design Playshop. Makeology: Makerspaces as learning environments, 1, 83-96.
- Wardrip, P. S., & Brahms, L. (2016). Taking making to school. *Makeology: Makerspaces as learning environments*, *1*, 97-106.
- Fields, D. A., & Lee, V. R. (2016). CRAFT TECHNOLOGIES 101. *Makeology: Makerspaces as learning environments*, *1*, 121.

Module 8

Equity, Inclusivity, and Accessibility

- Analyze and evaluate making as a practice that promotes democratization and impacts accessibility and inclusivity

Assignment:

- Read the readings and the lecture
- Blog post of reading reflection (500 words)
    - Provide a reflection on the week's readings related to the theoretical and methodological approaches and arguments, learning practices, your perspectives on why the work is (or is not) important to the field, potential discussion questions for the group, and a key take-away for yourself

- Discuss and provide feedback to all members in your blog cohort group (150 words)

Readings:

- Buechley, L., Eisenberg, M., Catchen, J., & Crockett, A. (2008, April). The LilyPad Arduino: using computational textiles to investigate engagement, aesthetics, and diversity in computer science education. In Proceedings of the SIGCHI conference on Human factors in computing systems (pp. 423-432). ACM.
- Buchholz, B., Shively, K., Peppler, K., & Wohlwend, K. (2014). Hands on, hands off: Gendered access in crafting and electronics practices. Mind, Culture, and Activity, 21(4), 278-297.
- Hollinworth, N. D., Hwang, F., Allen, K., Kwiatkowska, G., & Minnion, A. (2014, October). littleBits go LARGE: making electronics more accessible to people with learning disabilities . In Proceedings of the 16th international ACM SIGACCESS conference on Computers & accessibility (pp. 305-306). ACM.
- Hurst, A., & Kane, S. (2013). Making "Making" Accessible. In Proceedings of the 12th International Conference on Interaction Design and Children (pp. 635–638). New York, NY, USA: ACM. https://doi.org/10.1145/2485760.2485883
- Hurst, A., & Tobias, J. (2011). Empowering individuals with do-it-yourself assistive technology. Proceedings of the 13th International ACM SIGACCESS Conference on Computers and Accessibility ASSETS 11, 11–18. https://doi.org/10.1145/2049536.2049541

Designing and Evaluating a Makerspace

Module 9

Designing for Tinkerability

- Consider and evaluate various types of designed spaces in relation to promoting tinkerability
- Analyze and evaluate the potential and the challenges of implementing making toolkits and activities to promote inquiry-driven learning and community engagement

Assignment:

- Read 2 readings
- Blog post of reading reflection (500 words)
    - Provide a reflection on the week's readings related to the role of material arrangements in the makerspaces, potential discussion questions for the group, and a key take-away for yourself
- Discuss and provide feedback to all members in your blog cohort group (150 words)

Readings:

- Resnick, M., & Rosenbaum, E. (2013). Designing for tinkerability. Design, make, play: Growing the next generation of STEM innovators, 163-181.
- Litts, B. K. (2015, June). Resources, facilitation, and partnerships: three design considerations for youth makerspaces. In Proceedings of the 14th International Conference on Interaction Design and Children (pp. 347-350). ACM.
- Keune, A., Gomoll, A., & Peppler, K. (2015). Flexibility to learn: Material artifacts in makerspaces. In *fifth annual FabLearn Conference: Equity and Diversity in Making. Palo Alto, CA: Stanford University*.
- Keune, A., & Peppler, K. (2019). Materials-to-develop-with: The making of a makerspace. *British Journal of Educational Technology*, *50*(1), 280-293.

Module 10

Design Thinking

- Introduction to design thinking and various design methodologies
- Immerse yourself in the early phase of design thinking by visiting a makerspace

Assignment:

- Read the readings and the lecture
- Visit to the Makerspace – Makerspace Immersion Report

Readings:

- Yip, J., & Lee, K. J. (2018). The Design of Digital Learning Activities for Libraries Through Participatory Design. Reconceptualizing Libraries: Perspectives from the Information and Learning Sciences.
- Penuel, W. R., Chang-Order, J., & Michalchik, V. (2018). Using Research–Practice Partnerships to Support Interest-Related Learning in Libraries. In *Reconceptualizing Libraries* (pp. 239-256). Routledge.

Module 11

Problem Statement and Preliminary Ideation

- Introduction to the problem statement and the ideation phase of the design process

Assignment:

- Problem statement (co-designed problem statement, if possible) & three ideas from your preliminary ideation
- Discuss and provide feedback to all members in your blog cohort group (150 words)

Module 12

Design

- Introduction to various design methodologies to understand user needs and context

Assignment:

- Persona or scenario
- Discuss and provide feedback to all members in your blog cohort group (150 words)

Module 13

Revise and Re-iterate

- Introduction to evaluation strategies "in the wild" to revise and re-iterate your design

Assignment:

- Test report- (interview at least 2 target users): describe what worked and what did not
- Discuss and provide feedback to all members in your blog cohort group (150 words)

Module 14

Virtual Presentation of Your Makerspace via Kaltura/ Bringing it all together

Recognizing current and future trends in online searching.

Assignment:

- Mind map: student's conceptualization of learning and making
- Revisit mind map created in Module 1 and compare with mind map 2
- Virtual presentation of your makerspace using Kaltura
- Discuss and provide feedback to all members in your blog cohort group (150 words)

GRADING SCALE

Grade	Description
A 100 % to 96.0%	Outstanding achievement. Student performance demonstrates full command of the course materials and evinces a high level of originality and/or creativity that far surpasses course expectations.
A- 95.9 % to 90.0%	Excellent achievement. Student performance demonstrates thorough knowledge of the course materials and exceeds course expectations by completing all requirements in a superior manner.
B+ 89.9 % to 87.0%	Very good work. Student performance demonstrates above-average comprehension of the course materials and exceeds course expectations on all Modules as defined in the course syllabus.
B 86.9 % to 84.0%	Good work. Student performance meets designated course expectations, demonstrates understanding of the course materials, and performs at an acceptable level.
B- 83.9 % to 80.0%	Marginal work. Student performance demonstrates incomplete understanding of course materials.
C+ through C- 79.9 % to 70.0%	Unsatisfactory work. Student performance demonstrates incomplete and inadequate understanding of course materials. An incomplete may be granted under special circumstances.
D through F < 69.9 %	Student has failed the course. An incomplete is not an available option.

Note that to satisfy a core requirement, grade must be B- or above. For electives, grade must be C or above (and overall GPA 3.0 or above).

EXPECTATIONS, GUIDELINES, AND POLICIES

Attendance

The course will be taught entirely online including web-based readings and resources, threaded discussions, plus online presentations and activities.

This course assumes that students have the basic technology skills and can work independently. There are no required face-to-face meetings. There are no required synchronous online meetings. However, students are encouraged to e-mail or arrange to meet via zoom with the instructor.

A basic requirement of this course is that you will participate in all class activities and conscientiously complete all required course assignments. Students are expected to complete the assignments, quizzes, and projects on time, which is your attendance.

Students are advised (but not required) to use Canvas/Oncourse email for course-related activities given that emails from non-IUPUI addresses might be filtered out. For official program or campus related information, students are responsible for responding to mail sent to their IUPUI address.

Incompletes

Incompletes are only available when unexpected events prevent completion of the course requirements in the usual time frame. No student with multiple incompletes may register for additional courses. Left unchanged, an Incomplete automatically becomes an F after one year. See: IUPUI Registrar: Grade of Incomplete (registrar.iupui.edu/incomp.html)

Deliverables

You are responsible for completing each deliverable (e.g., Module) by its deadline and submitting it by the specified method. Deadlines and submission instructions are outlined in supplementary documents accessible through Canvas. In fairness to the instructor and students who completed their work on time, a grade on a deliverable shall be reduced 10%, if it is submitted late and a further 10% for each 24-hour period it is submitted after the deadline.

Your Questions, Concerns, and Comments

Please do not hesitate to contact the instructor directly via Canvas mail with any questions. If needed, the instructor will also use Canvas Announcements to notify the entire group (e.g., syllabus change, instructor availability, etc.).

If you have problems accessing Canvas, please contact the University Information Technology Services (UITS) Support Center at 317-274-HELP. All course Announcements will be found in Canvas along with the course schedule, assignments, and other course documents.

MLS PROGRAM OUTCOMES

The Master of Library Science (M.L.S.) program prepares students to become reflective practitioners who connect people and communities with information. Upon completion of the M.L.S. program, graduates are prepared to meet the program outcomes.

See M.L.I.S. Program goals: (soic.iupui.edu/lis/master-library-science/learning-outcomes/)

ALA MLS COMPETENCIES

A person graduating from an ALA-accredited master's program in library and information studies should know and, where appropriate, be able to meet the ALA standards.

See: ALA Core Competences of Librarianship (www.ala.org/educationcareers/sites/ala.org.educationcareers/files/content/careers/corecomp/coreco mpetences/finalcorecompstat09.pdf)

CODE OF CONDUCT

All students should aspire to the highest standards of academic integrity. Using another student's work on an assignment, cheating on a test, not quoting or citing references correctly, or any other form of dishonesty or plagiarism shall result in a grade of zero on the item and possibly an F in the course. Incidences of academic misconduct shall be referred to the Department Chair and repeated violations shall result in dismissal from the program.

All students are responsible for reading, understanding, and applying the *Code of Student Rights, Responsibilities and Conduct* and in particular the section on academic misconduct. Refer to The Code of Student Rights (studentcode.iu.edu/)

All students must also successfully complete the Indiana University Department of Education "How to Recognize Plagiarism" Tutorials and Tests (www.indiana.edu/~academy/firstPrinciples/)

You must document the difference between your writing and that of others. Use quotation marks in addition to a citation, page number, and reference whenever writing someone else's words (e.g., following the *Publication Manual of the American Psychological Association*). To detect plagiarism instructors apply a range of methods.

Academic Misconduct

1. **Cheating:** Cheating is considered to be an attempt to use or provide unauthorized assistance, materials, information, or study aids in any form and in any academic exercise or environment.
    1. A student must not use external assistance on any "in-class" or "take-home" examination, unless the instructor specifically has authorized external assistance. This prohibition includes, but is not limited to, the use of tutors, books, notes, calculators, computers, and wireless communication devices.
    2. A student must not use another person as a substitute in the taking of an examination or quiz, nor allow other persons to conduct research or to prepare

work, without advanced authorization from the instructor to whom the work is being submitted.

3. A student must not use materials from a commercial term paper company, files of papers prepared by other persons, or submit documents found on the Internet.
4. A student must not collaborate with other persons on a particular project and submit a copy of a written report that is represented explicitly or implicitly as the student's individual work.
5. A student must not use any unauthorized assistance in a laboratory, at a computer terminal, or on fieldwork.
6. A student must not steal examinations or other course materials, including but not limited to, physical copies and photographic or electronic images.
7. A student must not submit substantial portions of the same academic work for credit or honors more than once without permission of the instructor or program to whom the work is being submitted.
8. A student must not, without authorization, alter a grade or score in any way, nor alter answers on a returned exam or assignment for credit.

2. **Fabrication:** A student must not falsify or invent any information or data in an academic exercise including, but not limited to, records or reports, laboratory results, and citation to the sources of information.
3. **Plagiarism:** Plagiarism is defined as presenting someone else's work, including the work of other students, as one's own. Any ideas or materials taken from another source for either written or oral use must be fully acknowledged, unless the information is common knowledge. What is considered "common knowledge" may differ from course to course.
    1. A student must not adopt or reproduce ideas, opinions, theories, formulas, graphics, or pictures of another person without acknowledgment.
    2. A student must give credit to the originality of others and acknowledge indebtedness whenever:
        1. directly quoting another person's actual words, whether oral or written;
        2. using another person's ideas, opinions, or theories;
        3. paraphrasing the words, ideas, opinions, or theories of others, whether oral or written;
        4. borrowing facts, statistics, or illustrative material; or
        5. offering materials assembled or collected by others in the form of projects or collections without acknowledgment
    3. **Interference:** A student must not steal, change, destroy, or impede another student's work, nor should the student unjustly attempt, through a bribe, a promise of favors or threats, to affect any student's grade or the evaluation of academic performance. Impeding another student's work includes, but is not limited to, the theft, defacement, or mutilation of resources so as to deprive others of the information they contain.
    4. **Violation of Course Rules:** A student must not violate course rules established by a department, the course syllabus, verbal or written instructions, or the

course materials that are rationally related to the content of the course or to the enhancement of the learning process in the course.

5. **Facilitating Academic Dishonesty:** A student must not intentionally or knowingly help or attempt to help another student to commit an act of academic misconduct, nor allow another student to use his or her work or resources to commit an act of misconduct.

OTHER POLICIES

1. **Administrative withdrawal:** A basic requirement of this course is that students complete all required course activities. If a student is unable to attend, participate in, or complete an assignment on time, it is the student's responsibility to inform the instructor. If a student misses more than half of the required activities within the first 25% of the course without contacting the instructor, the student may be administratively withdrawn from this course. Administrative withdrawal may have academic, financial, and financial aid implications. Administrative withdrawal will take place after the full refund period, and a student who has been administratively withdrawn from a course is ineligible for a tuition refund. Contact the instructor with questions concerning administrative withdrawal. Learn more at IUPUI Administrative Withdrawal Policy (iupui.edu/withdrawal-policy.html)

2. **Civility:** To maintain an effective and inclusive learning environment, it is important to be an attentive and respectful participant in all course exercises. IUPUI nurtures and promotes "a campus climate that seeks, values, and cultivates diversity in all of its forms and that provides conditions necessary for all campus community members to feel welcomed, supported, included, and valued" (IUPUI Strategic Initiative 9). IUPUI prohibits "discrimination against anyone for reasons of race, color, religion, national origin, sex, sexual orientation, marital status, age, disability, or veteran status" (Office of Equal Opportunity). Profanity or derogatory comments about the instructor, fellow students, invited speakers, or any members of the campus community shall not be tolerated. A violation of this rule shall result in a warning and, if the offense continues, possible disciplinary action.

3. **Communication:** For online courses, the instructor or teaching assistant should respond to emails within two Indiana University working days, which excludes weekends and holidays. The instructor should accept appointments for face-to-face, telephone, or teleconferenced meetings, and announce periods of extended absence in advance.

4. **Conferences:** To present research at an academic conference as speaker is commendable and aligns with the educational and research mission of the school and university. However, instructors can only provide accommodations for absences if a student is presenting work, such as a paper or poster, or is supported by a school or campus-level scholarship. The student should request from the instructor accommodation for an absence as soon as possible upon paper, poster, or scholarship acceptance. In the request for accommodation for absence, the student should provide supporting documentation of acceptance as well as confirmation from their mentor or

campus sponsor that the presentation is to meet a research, educational, or diversity objective. Permission is granted at the discretion of the instructor. Students should not expect an exception for nonacademic conferences or conferences at which the student is not presenting as speaker. Travel arrangements should not be made until the student has received permission from the instructor.

5. **Counseling and Psychological Services (CAPS):** Students seeking counseling or other psychological services should contact the CAPS office at 274-2548 or capsindy@iupui.edu. For more information visit the CAPS website (iupui.edu/health-wellness/counseling-psychology/)

6. **Course evaluations:** Course evaluations provide vital information for improving the quality of courses and programs. Students are not required to complete a course or instructor evaluation for any section in which they are enrolled at the School of Informatics and Computing. Course evaluations are completed in Canvas (Course Questionnaire). Course evaluations are open from the eleventh week. Course evaluations are anonymous, which means that no one can view the name of the student completing the evaluation. In addition, no one can view the evaluation itself until after the instructor has submitted the final grades for the course. In small sections, demographic information should be left blank, if it could be used to identify the student.

7. **Disabilities policy:** In compliance with the Americans with Disabilities Act (ADA), all qualified students enrolled in this course are entitled to reasonable accommodations. Please notify the instructor during the first week of class of accommodations needed for the course. Students requiring accommodations because of a disability must register with Adaptive Educational Services (AES) and complete the appropriate AES-issued before receiving accommodations. Students with learning disabilities for which accommodations are desired should contact the Adaptive Educational Services office on campus, and inform the instructor as soon as possible: Adaptive Educational Services (AES) (iupui.edu/) 317-274-3241.

8. **Email:** Indiana University uses your IU email account as an official means of communication, and students should check it daily. Although you may have your IU email forwarded to an outside email account, please email faculty and staff from your IU email account.

9. **Emergency preparedness:** Know what to do in an emergency so that you can protect yourself and others. For more information, visit the emergency management website at Protect IU (protect.iu.edu/emergency)

10. **IUPUI course policies:** Several campus policies governing IUPUI courses may be found at IUPUI Course Policies (registrar.iupui.edu/course_policies.html)

11. **No class attendance without enrollment:** Only those who are officially enrolled in this course may attend class unless enrolled as an auditor or making up an Incomplete by prior arrangement with the instructor. This policy does not apply to those assisting a student with a documented disability, serving in an instructional role, or administrative personnel. See Administrative Policy: No Class Attendance without Official Enrollment (iupui.edu/official-enrollment-class-attendance.html)

12. **Religious holidays:** Students seeking accommodation for religious observances must submit a request form to the course instructor by the end of the second week of the

semester. For information visit <u>IUPUI Policy on Religious Holidays</u> <u>(registrar.iupui.edu/religious.html)</u>.

13. **Right to revise:** The instructor reserves the right to make changes to this syllabus as necessary and, in such an event, will notify students of the changes immediately.

14. **Sexual misconduct:** IU does not tolerate sexual harassment or violence. For more information and resources, visit <u>Stop Sexual Violence</u> (<u>iu.edu/</u>)

15. **Student advocate:** The Student Advocate assists students with personal, financial, and academic issues. The Student Advocate is in the Campus Center, Suite 350, and may also be contacted at 317 274-4431 or <u>studvoc@iupui.edu</u>. For more information visit <u>Division of Student Affairs</u> (<u>studentaffairs.iupui.edu/advocate</u>)

IUPUI COURSE POLICIES

A number of campus policies governing IUPUI courses may be found at the following link: **Course Policies** (registrar.iupui.edu/course_policies.html)

See the **Important Supplement for IUPUI Syllabi** (.pdf). A link to this document is also automatically included in each Canvas course as "Syllabus Supplement." This supplement covers:

- IUPUI Policy on Disability Accommodations
- IUPUI Policy on Religious Holidays
- IUPUI Policy on Academic Integrity
- IUPUI Policy on Sexual Misconduct
- Education and Title VI
- Military Related Personnel Statement
- Two-Step Login (Duo)

MISSION STATEMENT

The Mission of IUPUI is to provide for its constituents excellence in

- Teaching and Learning;
- Research, Scholarship, and Creative Activity; and
- Civic Engagement.

With each of these core activities characterized by

- Collaboration within and across disciplines and with the community;
- A commitment to ensuring diversity; and
- Pursuit of best practices.

IUPUI's mission is derived from and aligned with the principal components—Communities of Learning, Responsibilities of Excellence, Accountability and Best Practices—of Indiana University's Strategic Directions Charter.

STATEMENT OF VALUES

IUPUI values the commitment of students to learning; of faculty to the highest standards of teaching, scholarship, and service; and of staff to the highest standards of service. IUPUI recognizes students as partners in learning. IUPUI values the opportunities afforded by its location in Indiana's capital city and is committed to serving the needs of its community. Thus,

IUPUI students, faculty, and staff are involved in the community, both to provide educational programs and patient care and to apply learning to community needs through service. As a leader in fostering collaborative relationships, IUPUI values collegiality, cooperation, creativity, innovation, and entrepreneurship as well as honesty, integrity, and support for open inquiry and dissemination of findings. IUPUI is committed to the personal and professional development of its students, faculty, and staff and to continuous improvement of its programs and services.