

# ## Digital Making and Learning (ITLS 6270/5270)

## ### Instructor Information

- Instructor: Ravi Sinha
- Email: ravi.sinha@usu.edu (mailto:ravi.sinha@usu.edu)
- Class days and time: Wednesdays, 1:30–4:00 p.m.
- Class location: USU Education Building, EDUC 280
- You can reach me via the Canvas Inbox or by emailing me directly at ravi.sinha@usu.edu (mailto:ravi.sinha@usu.edu).
- Class Zoom Link: Here (<https://usu.zoom.us/j/88403766779?pwd=F6zGddaMUVOreaJPRKCfFshE23cHFY.1>)

## ### Course Description

This course is designed to introduce students to the world of tangible and interactive computing. During the course, students will explore a range of low-tech and high-tech tools, materials, and maker technologies. We will use microcontroller boards such as Makey Makey and the Micro:bit to create wearable and interactive artifacts that merge engineering, computing, and crafting. More broadly, we will discuss human-centered design processes and experiment with novel learning technologies. Using a project-based, studio-style approach, students will gain hands-on experience in making and design practices.

We will meet weekly to discuss course readings and explore diverse prototyping methods. Students will spend most of their time creating and evaluating DIY projects and iterating on their ideas and designs. Throughout the semester, students will document their work in their design journal and also for the broader DIY audience (e.g., Instructables and/or the class website), sharing their design processes, motivations, learnings, and challenges.

This syllabus may be revised to accommodate student needs and interests.

## ## Goals

By the end of this course, students will be able to:

1. Understand how computational thinking and design can be incorporated into everyday life.
2. Develop proficiency in tangible computing and creative design (e.g., simple interactive behaviors).
3. Develop an appreciation for computational crafts and how these skills can be integrated into communities.

## ## Class Schedule

Schedule ([https://docs.google.com/spreadsheets/d/1xyT-bpk4n-iiu89\\_6tMB2k-OTy\\_B1xjyy1lLoo5uEx0/edit?gid=34275187#gid=34275187](https://docs.google.com/spreadsheets/d/1xyT-bpk4n-iiu89_6tMB2k-OTy_B1xjyy1lLoo5uEx0/edit?gid=34275187#gid=34275187))

## ## Course Grading Scale

- A: 93% to 100%

- A-: 90% to <93%
- B+: 87% to <90%
- B: 83% to <87%
- B-: 80% to <83%
- C+: 77% to <80%
- C: 73% to <77%
- C-: 70% to <73%
- D+: 67% to <70%
- D: 63% to <67%
- D-: 60% to <63%
- F: 0% to <60%

## ## Major Assignments

- Design Journal: 30%
- Interactive Exhibit: 40%
- Discussion Lead: 20%
- Class Participation: 10%

### ### Design Journal (30%)

Students are expected to maintain a design journal to document their learning and progress as they engage in DIY projects and explore new ideas, materials, and technologies throughout the semester. The purpose of journaling is to engage in the practice of systematic documentation and reflection. Journaling is a great way to track drafts and design iterations. There are two parts to the design journal: unstructured and structured. The format for the unstructured (free-flow) part of the journaling is up to students to decide. For the structured parts, students are encouraged to incorporate the following components:

- **Weekly memos:** A written reflection (a short memo of 200–300 words) on weekly learning and explorations.
- **Process memos** (optional but encouraged): Students are also encouraged to take memos of their prototyping experiences, noticing their learning, frustrations, challenges, and surprises.
- **Portfolio-style documentation of exploration projects:** Portfolios are a great way to document maker projects. The design journal could be a one-stop destination for drafts and iterations of the exploration projects that will be part of the weekly class assignments.

### ### Interactive Exhibit (40%)

Together as a class, we will organize an interactive exhibition for young learners (primary and middle grade levels) towards the end of the course. The iterative design and development of the artifacts for the exhibition will give us opportunities to apply the knowledge and skills learned during the course in a real-world context. We will engage in at least one round of user feedback and incorporate revisions based on user testing into our final artifacts. We will also document our prototyping experiences, including insights from user testing. Additionally, we will connect our prototyping experiences to the theoretical ideas we will explore throughout the semester. The final submission will be a written portfolio (3,000–4,000 words) that presents the design case and prototyping experiences in the form of a design narrative. Students are also expected to document and share an abridged and accessible version of this portfolio for the wider DIY open-source community to extend those ideas and designs.

## ### Discussion Lead (20%)

Each student will lead the discussion twice during the semester (for weekly readings and a workshop). For the readings, students are expected to synthesize key themes across the readings and engage in critical reflection with the group, rather than presenting a summary of each reading. For the workshop, students are encouraged to facilitate by blending constructionist and studio-style approaches.

## ### Class Participation (10%)

Students are expected to participate actively in class discussions and activities throughout the semester.

# ## Policies and Information

## ### Shared Values & Studio Norms

- Willingness to contribute and ask for help
- Engaging in and practicing constructive criticism
- Respectful sharing of different opinions
- Adaptability
- Creating a safe and inclusive space
- Collaboration
- Sharing expertise and creativity
- Developing relationships and a sense of fulfillment

## ### Materials

Core technologies and crafting supplies for required projects will be provided by the course. Students may choose to purchase additional materials for their final project.

## ### Participation, Attendance & Late Work

- Attendance is required. This course is structured as a studio-based learning environment. Students are expected to arrive on time, complete readings and assignments before class, share work-in-progress, and provide constructive feedback.
- Missing more than one class may result in a reduction of participation points, unless there are extenuating circumstances.
- Late work is handled on a case-by-case basis and accepted at the instructor's discretion.
- Any case involving academic dishonesty or any other violation of the Honor Code will be referred to the University for further action.