Maker Studio
Curricular Integration
Information Guide

Integrating the Maker Studio into coursework

Last updated March 2020
INTEGRATING THE MAKER STUDIO INTO COURSEWORK

The Maker Studio in the Mount Royal University Library is a leader in demonstrating how an academic maker space promotes creativity, innovation, design, making, and 21st Century competencies in learning, teaching, and scholarship, providing an exceptional experience for students, faculty, staff, and community members.

1. What we can do for you
   a. Workshops
      i. Workshops to choose from (see Appendix A).
   b. Tutorials
      i. Tutorials on Software to choose from (see Appendix A).
   c. Lectures and Seminars
      i. Teaching and active learning activities in classrooms, Maker Studio or other locations (see Appendix A).
   d. Custom Content Creation
      i. Any of the above custom developed in collaboration for your class based on expertise in the Maker Studio.

2. What we do not do
   a. Teach without faculty present.
   b. Teach without the project outline and clear expectations for what is being delivered.
   c. Adjust project deadlines based on extensions given last minute. We are busy and schedule student deadlines. If changes are made to deadlines for projects, we need to be notified in advance in order to establish if we can support students with changed deadlines. We may not have the flexibility to support students with projects if deadlines are changed due to scheduling and requirements of other courses.

3. What your students get out of the Maker Studio experience
   a. The Maker Studio provides up-to-date technology for design, creative thinking and making. This supports experiential learning opportunities through making in a learning space that supports transformational experiences. Using the Maker Studio and its staff allows students to experiment and learn in and beyond the classroom supporting an exceptional undergraduate educational experience at MRU.
   b. Students will engage in hands on projects and can develop a large range of 21st Century skills and competencies such as; Fundamental Skills and

c. The Maker Studio shares its core values with all of its users. These include: Accountability, Collaboration, Community, Creativity, Diversity, Empowerment, Inclusion, Integrity, Iteration, Learning, Passion, Research, Risk Taking, Sharing, Skill Building.

4. Important points for faculty to consider in projects that include making in the Maker Studio

a. The Creative Process: The creative process takes time involving:
   i. Preparation: Research into the problem you are solving (problem definition).
   ii. Incubation: Analyze the information, define the goal (concept development).
   iii. Illumination: Ideation and planning (sketching).
   iv. Implementation: Prototype and make the idea (iteration).

b. Making takes time: Understanding the process for making with the tools includes:
   i. Orientation to the space and tools.
   ii. Choose and purchase materials.
   iii. Test the materials with the tool, make an initial version.
   iv. Adjust the design and make the final version.

c. Creating and Making leads to deep learning opportunities for students:
   i. Realizing ideas through the creative process and making demonstrates originality, creativity, problem solving, communication, failing forward, innovation and experiential (and sometimes transformational) learning.
   ii. Learning the software or tool required for making builds digital literacies. Encourage students to avoid downloading existing objects unless they are too complicated to model in the time frame allotted. Using designs created by others should be cited appropriately.
   iii. Allocating the appropriate amount of time for the project leads to the best outcomes for students and the ability for them to think critically about what is being made.
d. Motivation:
   i. The Maker Studio experience has demonstrated an increase in intrinsic motivation for students to be more personally involved and complete projects on time.
   ii. Students are also motivated and their time management can be improved by multiple deadlines and grades. Consider allocating grades for parts of the process so that the instructor can keep track of progress and provide feedback and input on the project throughout. Even small allocations of grades motivate students to be better prepared and manage their time better for success. See the example of grade allocations for the project process in Appendix B.

e. What we can accommodate in the Maker Studio:
   i. It is strongly encouraged for faculty to attend the General Orientation to the Maker Studio (30 Minutes). This will enable faculty to have a better understanding of what is possible in the Maker Studio and they will be able to assist their students. Prepared students make this process more successful and it is easier for us to provide the best service and assistance possible. Please advise students to:
      1. Consult with Maker Studio staff early in the ideation and planning process.
      2. Participate in orientations, workshops and tutorials to help in understanding the capabilities of the tools.
      3. Access the resources provided on the website eg. Orientation Documents, Guidelines, Procedures, Tutorials, and Health and Safety Information.
      4. Sign the Waiver (linked on the website and in the sign-in form in the Maker Studio).
      5. Arrive with a developed idea, a sketch, a rendering, a model, a design, some materials, knowledge of the capabilities of the tool, and an understanding of scale (how big do you want it?).
      6. Allocate time to consult with Maker Studio staff. If a student shows up last minute, there might be a queue for assistance.
      7. Allocate time for things to fail, go wrong, not work out as anticipated, break or be incredible and want to make more of them.
5. Procedures for collaborating with the Maker Studio
   i. Read the Curricular Integration Guide.
   ii. Book a consultation meeting with the Maker Studio Specialist.
   iii. Complete the Application form for curricular integration with the Maker Studio.
   iv. Submit the Syllabus and Project Outline for the Course.
   v. Faculty and students must sign the Waiver of Liability.
   vi. Faculty and students must read the Guidelines for the Maker Studio.
   vii. Complete the Maker Studio Faculty Feedback Form.
   viii. Send the General Feedback Form to students.
APPENDIX

Appendix A

Readymade Workshops and Presentations List (last updated March, 2020)

Orientations in the Maker Studio
- Orientation to the Maker Studio
- 3D Printing Orientation in the Maker Studio
- Cutting Tools Orientation in the Maker Studio
- Sewing/ Embroidery Machine Orientation in the Maker Studio
- Electronics and Robotics Orientation in the Maker Studio

Software Workshops in the Maker Studio
- Illustrator for the Cutting Tools
- 3D Modelling in Tinkercad with the Maker Studio Staff
- Vinyl cutting with the Silhouette Cameo
- Using Easel software for CNC carving projects
- Setting up a 3D Print
- Z Brush Workshop
- Fusion 360: 3D modelling the next level:

Electronics and Robotics Programming
- Makey Makey Workshop
- Programming Literacy
- Prototyping Electronics Using Breadboarding
- Beginner Programming with Scratch
- Introduction to Arduino
- Learn a Programming Language: Python
- Robotics with Lego Mindstorms
- Moving and Object with Arduino
- Paper Circuits
- Simple Coding with Little Bits
- Understanding Electricity Using Little Bits

Design and Creativity Workshops
- Design Thinking
- Design Fiction
- Semiotics
- Culture Jamming
Visual Communication
Logo Design using Adobe Illustrator
Ideation
Concept Development
Insights for Innovation

**Tool Specific Workshops**
- 3D Scanning Tools
- Making Affirmations with Button Making Tools

**Sustainability Series**
- Repair Café in the Maker Studio
- Tote Making in the Maker Studio

**Appendix B**

**Sample Maker Studio Project Grade Breakdown**

<table>
<thead>
<tr>
<th>Component</th>
<th>% Grade allocated</th>
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<tbody>
<tr>
<td><strong>Research component</strong></td>
<td>Submission of an annotated bibliography, citations, or research paper.</td>
</tr>
<tr>
<td><strong>Ideation sketches and concept development</strong></td>
<td>Sketches, mind maps or other visual representation of idea generation.</td>
</tr>
<tr>
<td><strong>Work with Maker Studio</strong></td>
<td>This could involve taking a workshop, meeting one-on-one with staff, accessing documents available from the Maker Studio. This could also involve project planning/ process of making and documentation or reflection on that process or experience.</td>
</tr>
<tr>
<td><strong>Final object and object documentation</strong></td>
<td>This can be the actual object, video, or a photograph of the object (we have a seamless phot box and DSLA camera in the Maker Studio).</td>
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