COURSE OUTLINE IDES 4101 • ADVANCED STUDIES IN MANUFACTURING • FALL (2019)

Instructor: Paul Durocher
pauldurocher@cunet.carleton.ca
Room 2460 Mackenzie Building (ME).
Tel. 613 • 560 • 2600, ext. 5672

Teaching Assistant: None
Office Hours: During studio/lecture hours or by appointment.

Time and Location: Please refer to Carleton Central under Student Services – Registration – Search Schedule: https://admissions.carleton.ca/faqs/where-can-i-find-the-class-schedule/

Course Description:
Directed study in the field of manufacturing, centred on such topics as: cost analysis, new materials and processes, computer aided manufacturing, numerically controlled machining, machining of moulds, etc. Includes: Experiential Learning Activity. Prerequisite(s): IDES 2101 and IDES 2102.

Learning Outcomes:
LOGs linked from course outline excel sheet

1.
2. Etc.
Learning Outcomes

1. Understand CNC hardware and use CAM software to generate programs to manufacture basic parts using appropriate machining strategies.

2. Demonstrate advanced workflow utilizing various digital and analog tools in a DFM project.

3. Understand the tools and process of capturing a 3D scan of an existing object and manipulating that scan for various workflows e.g. reverse engineering, renderings, redesign, underlays, etc.

4. Create a typical package of documentation to be used in the request for quote (RFQ) process and better understand communication between designer and manufacturer.

5. Document their process-work to enhance their portfolio and demonstrate their skills in specialized areas of design.
Required Materials:

Materials required for the course are listed below. You may be asked by your instructor to refer to cuLearn and ARES for a more comprehensive list of required materials.

Computer Requirements:

Please refer to the computer requirements on the School of Industrial Design Website:

http://www.id.carleton.ca/undergraduate/about-the-bid-program/computer-requirements

An Autodesk student account must be setup in order to install Fusion 360 which will be used throughout the course.

Course Deliverables:

These are the deliverables for this course. Please see Appendix A Course Schedule for more detailed information.

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Grading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab 1: Manual CNC programming</td>
<td>10% (Individual)</td>
</tr>
<tr>
<td>Lab 2: 2.5D CAM programming</td>
<td>15% (Individual)</td>
</tr>
<tr>
<td>Lab 3: 3D CAM programming (CNC)</td>
<td>25% (Group)</td>
</tr>
<tr>
<td>Lab 4: 3D scanning Art-to-part</td>
<td>15% (Group)</td>
</tr>
<tr>
<td>Lab 5: 3D printing</td>
<td>15% (Group)</td>
</tr>
<tr>
<td>Lab 6 Course review/documentation report</td>
<td>20% (Individual)</td>
</tr>
</tbody>
</table>

Individual/Group Work
Courses may include individual and group work. It is important in collaborative work that students clearly demonstrate their individual contribution.

**Studio Review Attendance**

Attendance at scheduled SID Reviews is mandatory. These are equivalent to exams when indicated in the course outline. Failure to attend the Review without reasonable cause, will result in a grade of F. Students arriving late for the Review or not remaining for the complete session without approval from the instructor, will be addressed on a case-by-case basis at the discretion of the instructor.

If you are not able to attend a Review, foresee arriving late or need to leave before it is complete, please email your instructor in advance explaining the reason for the situation. It is important that you provide a reasonable rationale for your absence, late arrival or early departure. In the event of an illness or death in the family, you will be required to sign a form verifying your claim and this form is available through the SID administration office.

**Late Submission of Lecture & Studio Deliverables**

Students who do not hand in deliverables on time will have their earned grade reduced by 15% per day up to a maximum of 3 days.

**Participation and Professionalism**

Active participation and professional conduct (e.g. class discussion, consultations with instructors, work ethic, etc.) are important in lecture and studio courses and may be formally evaluated by a grade.

**Student Access to Quiz, Test and Exam Papers**

Examinations will be returned to students with comments and explanations.

**Requests for Academic Accommodation**
You may require special arrangements to meet your academic obligations during the term. For an accommodation request for any of the following topics below, refer to the link provided for more information: https://students.carleton.ca/course-outline/

- Parental Leave
- Religious/Spiritual Obligation
- Academic Accommodations for Students with Disabilities
- Survivors of Sexual Violence
- Accommodations for Student Activities

**Academic Integrity**

Carleton’s Policy on Academic Integrity is available at: https://carleton.ca/registrar/academic-integrity/ and covers the following topics:

**Plagiarism** (e.g. submitting work in whole or in part by someone else, failing to acknowledge sources through the use of proper citations when using another’s work).

**Test and Exam Rules** (e.g. attempting to read another student’s exam paper, speaking to another student even if the subject matter is irrelevant to the text, using material not authorized by the examiner).

**Other Violations** (e.g. improper access to confidential information, disruption in classroom activities, misrepresentation of facts for any academic purpose).

The policy governs the academic behavior of students. In industrial design, ideas and concepts come from a multitude of sources and may be modified and utilized in the design and development process. The student should reference such sources appropriately and it is strongly advised that you read Carleton’s Policy on Academic Integrity prior to conducting any work at the University.
Student Responsibility

The student is responsible for knowing the content of this course outline; the schedule of classes, assignments, and/or Reviews; and the material that was covered when absent. The studio is a professional environment and students should be working during the scheduled hours.

Unless otherwise arranged, the class will meet during scheduled class hours. Please note that attendance is important since issues and questions may be raised in class, and announcements made, along with information disseminated through cuLearn. As external professionals are often involved in our work, scheduling changes for guest lectures, presentations, and Reviews may occur at short notice, requiring students to stay informed.

Changes to the Course Outline

The course outline may be subject to change in the event of extenuating circumstances.

Appendix A - Course Schedule

Appendix A – Course Schedule IDES 4101 • ADVANCED STUDIES IN MANUFACTURING • FALL (2019)

| Week   | Date     | Manual Programming | Lab 1 Assigned | Lab 1 Due  
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>06.SEP.19</td>
<td>Lab 1 Assigned</td>
<td>Lab 1 Due</td>
<td></td>
</tr>
<tr>
<td>Week 2</td>
<td>13.SEP.19</td>
<td>2.5D CAM</td>
<td>Lab 2 Due</td>
<td></td>
</tr>
<tr>
<td>Week 3</td>
<td>20.SEP.19</td>
<td>3D CAM</td>
<td>Lab 3 Due</td>
<td></td>
</tr>
<tr>
<td>Week 4</td>
<td>27.SEP.19</td>
<td>Machine Setup</td>
<td>Lab 3 Due</td>
<td></td>
</tr>
<tr>
<td>Week 5</td>
<td>04.OCT.19</td>
<td>Design Workflow</td>
<td>Lab 3 Due</td>
<td></td>
</tr>
<tr>
<td>Week 6</td>
<td>11.OCT.19</td>
<td>Cutting parts</td>
<td>Lab 3 Due</td>
<td></td>
</tr>
<tr>
<td>Week 7</td>
<td>18.OCT.19</td>
<td>3D Scanning</td>
<td>Lab 4 Assigned</td>
<td></td>
</tr>
</tbody>
</table>

Lab 1 Due: (Wednesday September 11 by 6:00pm)
Lab 2 Due: (Wednesday September 18 by 6:00pm)
Lab 3 Due: (Wednesday October 9 by 6:00pm)
Lab 4 Assigned: (Wednesday October 9 by 6:00pm)
<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Event/Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 8</td>
<td>25.OCT.19</td>
<td>FALL BREAK</td>
<td>No Class</td>
</tr>
<tr>
<td>Week 9</td>
<td>01.NOV.19</td>
<td>Art to part workflow</td>
<td></td>
</tr>
<tr>
<td>Week 10</td>
<td>08.NOV.19</td>
<td></td>
<td>Lab 4 Due (Wednesday 6 November 6 by 6:00pm)</td>
</tr>
<tr>
<td>Week 11</td>
<td>15.NOV.19</td>
<td>3D Printing</td>
<td>Lab 5 Assigned</td>
</tr>
<tr>
<td>Week 12</td>
<td>22.NOV.19</td>
<td>Inspection/Quality Control</td>
<td>Lab 6 Assigned</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Friday November 22 in class)</td>
</tr>
<tr>
<td>Week 13</td>
<td>29.NOV.19</td>
<td>Group Presentations of Lab 5</td>
<td></td>
</tr>
<tr>
<td>Week 14</td>
<td>06.DEC.19</td>
<td></td>
<td>No Class (Monday Schedule)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lab 6 Due (Wednesday December 4 by 6:00pm)</td>
</tr>
</tbody>
</table>