Southern Polytechnic State University
MET 3332 – Rapid Design and Manufacture
(2-3-3)

MET 3332  Rapid Design and Manufacture is a course focused on bringing products to market as quickly as possible using traditional technologies as well as through the use of 3D scanning and additive manufacturing technologies. Product Design, reverse engineering, and rapid prototyping are topics covered and applied in the course.

Prerequisite:  EDG 1212, MET 2322, or permission from instructor

Instructor:  Randy Emert
Assistant Professor, Mechanical Engineering Technology

Office Hours:  By Appointment
Q151
678-915-7406
remert@spsu.edu

Textbook:  Company websites
White papers
Journal Articles

Outcomes:  Students completing MET 4903 will have the ability to:
1.  Complete a product design cycle from initial concept to prototype to production.
2.  Apply 3D scanning technology from initial scan to CAD file and/or rapid prototype.
3.  Determine which additive manufacturing technology may be applied to speed development in design and/or manufacturing.
4.  Apply 3d printing to manufacturing applications.
5.  Provide cost comparisons between traditional manufacturing and additive manufacturing.
6.  Develop camaraderie in an engineering team environment.

Grading:  Assignments  10%
Labs  20%
Projects  25%
Midterm  20%
Final Presentation  25%

Assignments:  Assignment due dates will be provided in class. Description of the assignment will be posted in D2L.

Labs:  Labs are assigned daily and/or weekly. All laboratory projects are completed in the SPSU laboratories. Laboratory exercises maybe performed in small groups.

Project:  There will be three projects: Design, 3D printing, and 3D scanning.
Midterm: A midterm paper 5-7 pages on a rapid prototyping process.

Final: A final project will be selected, approved, and presented to the class.

Attendance: Therefore, attendance is extremely important in order to gain the skills necessary to complete the final projects on time.

Late Work: Late labs and projects will not be accepted. Makeup tests are not given. However, if prior arrangements have been made or due to extenuating circumstances exceptions may be granted.

Honor Code

As a member of the Southern Polytechnic State University community of scholars, I understand that my actions are not only a reflection on myself, but also a reflection on the University and the larger body of scholars of which it is a part. Acting unethically, no matter how minor the offense, will be detrimental to my academic progress and self-image. It will also adversely affect all students, faculty, staff, the reputation of this University, and the value of the degrees it awards. Whether on campus or online, I understand that it is not only my personal responsibility, but also a duty to the entire SPSU community that I act in a manner consistent with the highest level of academic integrity. Therefore, I promise that as a member of the Southern Polytechnic State University community, I will not participate in any form of academic misconduct. I also understand that it is my responsibility to hold others to these same standards by addressing actions that deviate from the University-wide commitment to working, living, and learning in an environment conducive to a quality education. Thus, I affirm and adopt this honor code of Southern Polytechnic State University.

MET 4903 – Rapid Design and Manufacture

<table>
<thead>
<tr>
<th>WK</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>WK1</td>
<td>Product Design</td>
</tr>
<tr>
<td>WK2-3</td>
<td>Rapid Prototyping</td>
</tr>
<tr>
<td>WK4</td>
<td>3D Scanning</td>
</tr>
<tr>
<td>WK5</td>
<td>Design Freedom</td>
</tr>
<tr>
<td>WK6</td>
<td>Fixture/Tooling</td>
</tr>
<tr>
<td>WK7</td>
<td>Sand Casting</td>
</tr>
<tr>
<td>WK8</td>
<td>CAD/CAM</td>
</tr>
<tr>
<td>WK9</td>
<td>Injection Molding</td>
</tr>
</tbody>
</table>

This syllabus including scheduling and grading may be modified based on mutual agreement of instructor and student.