Fall 2020

FED 101-031: Fundamentals of Engineering Design I

Swapnil Moon

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FED-101  
**COURSE OUTLINE**

**Instructor:** Dr. Swapnil Moon  
Office: 333 CD  
Phone: 201-665-2223  
E-mail: swapnil.moon@njit.edu

**Office Hours:** Wednesday 11:00 to 1:00 PM & by appointment

**References:**
1. **FUNDAMENTALS OF GRAPHICS COMMUNICATION** by Gary R. Bertoline, Eric N. Wiebe et al.  

**Course Description:**
- Study technical graphics and the computer as a technical drawing tool;
- Introduction to projections and multi-view drawings and visualization;
- Discuss geometry commonly used in engineering design graphics, orthographic projections;
- Dimensioning techniques, tolerance and introduction to auxiliary and sectional views;
- Apply software program Creo Parametric 7.0 (previously known as Pro/Engineer/Wildfire) to various problems.

**Grading Scheme:**

<table>
<thead>
<tr>
<th>Component</th>
<th>Points Each</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Exercises (Attendance)</td>
<td>5</td>
<td>60</td>
</tr>
<tr>
<td>Lab Exercises</td>
<td>20</td>
<td>240</td>
</tr>
<tr>
<td>Drawing Assignments</td>
<td>50</td>
<td>600</td>
</tr>
<tr>
<td>Two Exams</td>
<td>100</td>
<td>200</td>
</tr>
<tr>
<td>Project</td>
<td>400</td>
<td>400</td>
</tr>
</tbody>
</table>

**Total 1500 points**

**Course Policies:**

1. Attending class, completing assignments on time, and keeping up with the class material is important for success in this course and in college. Generally, late or missed assignments will not be accepted except for legitimate (pre-approved when possible) reasons as determined by the instructor. Examples of legitimate reasons are: illness, death in family, etc. The method of handling late or missed work is determined by the instructor.
2. ANY FORM OF CHEATING ON ASSIGMENTS OR EXAMS WILL RESULT IN AN “F” FOR THE COURSE. This includes looking at another person’s exam or copying another person’s work for exams or assignments.
3. The student who compromised as well as the student who allowed will BOTH be awarded the SAME penalty.
4. NJIT honor code will be used for all situations that involve cheating, copying, misrepresentation of student work, and misrepresentation of student information and any
violations will be brought to the immediate attention of the Dean of Students (visit http://www.njit.edu/academics/honorcode.php.)

5. Attending progress meetings scheduled throughout the semester is mandatory

6. All class exercises, lab exercises, and assignments must include submission of an electronic file. The file must be submitted by the due date via Canvas. The files must be named jdoe_class_ex_XX.prt, jdoe_lab_ex_XX.prt, or jdoe_assignment_XX.prt (or other appropriate file extension that is correct for the type of assignment). XX represents the exercise or assignment number.

7. Weekly assignments are due BEFORE the start of Lecture. Assignments turned in after the lecture starts are late and count as a completed assignment but are worth 0 points.

8. Class exercises and lab exercises are due at the end of the class unless the instructor has given an extension. Exercises turned in after the class has ended or the extended deadline are late and count as a completed assignment but are worth 0 points.

9. Students may not have missed more than a total of three weekly assignments to pass the course. A missing assignment can be submitted late for completion credit but will be given a grade of zero. ONCE THREE ASSIGNMENTS ARE MISSING, ALL ASSIGNMENTS AND EXERCISES MUST BE COMPLETED TO PASS THE COURSE!!!

10. Students may not have missed more than a total of ten exercises and assignments to pass the course. Missing exercises and assignments can be submitted late for completion credit but will be given a grade of zero. ONCE A TOTAL OF TEN ASSIGNMENTS AND EXERCISES ARE MISSING, ALL ASSIGNMENTS AND EXERCISES MUST BE COMPLETED TO PASS THE COURSE!!!

11. If a student misses or receives a zero for five weekly assignments the grade for the class is F.

12. Students are required to get a Vernier caliper.

13. The student must ask the instructor for special allowances associated with disabilities.

14. For any modifications or deviations from the syllabus throughout the course of the semester, instructor will consult with students and the students must agree to.

15. Taking the Mid Term Exam is mandatory to receive a final grade in the course.

16. Reasonably equal Team Participation in Team Project is required for a grade

17. Unequal Team Participation in Team Project will affect the grade of ALL the members of a team

ACADEMIC INTEGRITY

“Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at:

http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf
Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university. If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu.”

**Administration of Exams**

- Exams will be administered using either a combination of Respondus + Lockdown Browser and Webex or through ProctorU Review+.
- Students need to have access to a laptop to be able to take the exam using the above mentioned tools.
- NJIT honor code will be strictly adhered to, any violations will be processed through the office of Dean of students.

**NJIT Makerspace**

As a part of this course students are required to complete the training in the following Makerspace courses:

- Make 101 - Introduction to the Makerspace (This course introduces users to the policies and safety procedures of the space and provides basic training for simple hand tools)
- Make 103 - Introduction to 3D Printing (Briefly covers the basics of 3D printing including basic maintenance and operation, model preparation and slicing, starting, monitoring, and removing a print)
### Tentative Syllabus

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Policies, Creo Introduction, Definitions, Basic Skills Orthographic and Multiview projection, six principle views,</td>
</tr>
<tr>
<td>2</td>
<td>Datums, Holes, Sketching tools, Sketching constraints, Extruding, References, Constraints</td>
</tr>
<tr>
<td>3</td>
<td>Datums, Extrude, Constraints, History Tree, Project Tool, Rounds and Fillets Modifying an existing sketch</td>
</tr>
<tr>
<td>4</td>
<td>Datums, Relations, Sketching tools, Constraints, Patterns, History Tree Additive manufacturing, Slicing, Using Cura, 3D Printing</td>
</tr>
<tr>
<td>5</td>
<td>Datums, Sketching, Revolve, Patterns, Relations Engineering design process</td>
</tr>
<tr>
<td>6</td>
<td>Sketching, Patterns, Mirror, Lettering Intellectual property in engineering design</td>
</tr>
<tr>
<td>7</td>
<td>Blends Preliminary design, Designer’s notebook</td>
</tr>
<tr>
<td>8</td>
<td>2D Sweeps, Shell, Rib Physical decomposition</td>
</tr>
<tr>
<td>9</td>
<td>Helical Sweeps, Sweep-Blends, 3D Sweeps Building prototypes and testing</td>
</tr>
<tr>
<td>10</td>
<td>Assembly modeling</td>
</tr>
<tr>
<td>11</td>
<td>Assembly modeling, Animation</td>
</tr>
<tr>
<td>12</td>
<td>Multi-View Drawings, Section Views, &amp; Dimensioning</td>
</tr>
<tr>
<td>13</td>
<td>Multi-View Drawings, Section Views, &amp; Dimensioning</td>
</tr>
<tr>
<td>14</td>
<td>Final Exam</td>
</tr>
</tbody>
</table>