

1. CGT 16300 – Graphical Communication and Spatial Analysis

2. Credits and contact hours:

2 credits

Lecture – 1 days per week at 50 minutes for 15 weeks.

Lab Prep - 1 day per week at 50 minutes for 15 weeks.

Lab - 1 day per week at 110 minutes for 15 weeks.

3. **Instructor's or course coordinator's name:** Prof. Craig L. Miller, Dixuan Cui, Izza Tariq, Varanya Upatising, Syed Faaiz Hussain ...

4. **Textbook(s):** To be determined. Materials may be assigned at a later time. Note: One or more linked sections for this course has materials associated. Please review the linked section to get the materials for that section.

a. **Other supplemental materials:** None

5. Specific course information

a. **Catalog description:** An introductory course in computer graphics applications for mechanical- and aeronautical-related professions. Experiences focus on visualization, sketching, graphic standards, and problem-solving strategies for engineering design. The course will emphasize the proper use of parametric solid modeling for design intent. Typically offered Fall Spring.

b. **Prerequisites or co-requisites:** None

c. **Course status:**

6. Specific goals for the course

a. **Student Learning Outcomes:**

1. Demonstrate the knowledge and utilization of sketching for problem solving in an engineering environment.
2. Understand CAD file interoperability by exchanging files in different CAD software packages.
3. Successfully utilize visualization abilities for creative problem solving in an engineering environment.
4. Systematically identify, evaluate and solve engineering problems using points, lines, surfaces, and solid geometry.
5. Use geometric construction techniques when creating 2D and 3D geometric forms for the construction of solid models.
6. Understand the history, research, and implications of graphics for engineering design.
7. Develop the ability to present clearly identified solutions using graphical communication conventions and standards.

b. **Relationship of course to program outcomes:**

7. Topics

- 1 3D Modeling: surface & solid parametric constraint-based master model concepts; top-down & bottom-up assemblies, drawing, digital mock-up
- 2 Orthographic Projections and Multi-view sketching: coordinate systems; 3D views & displays; auxiliary views; isometric pictorial sketches.
- 3 Engineering Geometry and Construction
- 4 The Design Process and Analysis: 3D graphical databases.
- 5 Graphical design standards; dimensioning, tolerancing, & GTD: working drawings reading & development, threads & fasteners