FLORIDA POLYTECHNIC UNIVERSITY

EGN 1110C.03 – Visual Engineering Studio Sketching, Diagrams, and 2D CAD

Course Information

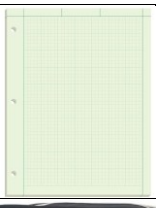
- **Course Number and Title**: EGN 1110C.03, Visual Engineering Studio: Sketching, Diagrams, and 2D CAD
- **Credit Hours:** 2 Credit Hours
- **Academic Term:** Spring 2026

Instructor Information

- **Instructor:** Dr. Sanjeeta N. Ghimire
- **Office Location:** WEB 1023
- **Office Hours**: W, Th, and F: 1:00 – 2:00 PM, or by appointment
- **Email address**: sghimire@floridapoly.edu

Course Delivery and Course Description

- **Delivery Mode**: In-Person
  - **Lecture Time:** Tuesday/Thursday, 2:00 – 3:15 pm
  - **Lecture Location:** WEB 1002/1004
- **Official Catalog Course Description**: This studio-style course introduces students to the foundational skills of engineering visualization and communication. Through hands-on exercises in freehand sketching, diagram creation, and 2D CAD software, students will learn to convey complex engineering concepts with clarity and precision. Topics include technical drawing, perspective and scale, visual storytelling, and the principles of effective diagram design. The course combines technical rigor with an artistic approach to help students develop the ability to communicate ideas visually in engineering and design contexts.
  - **Course Pre-Requisites**: None
  - **Communication/Computation Skills Requirement (6A-10.030)**: No
- **Required Texts and Materials:**
  - **Textbook:** None
  - **Required Materials:** A few materials will be provided to the student during the first week of the semester to get the course started. However, this course requires a set of additional materials to be purchased or otherwise acquired by the student. The student may purchase these items on their own or can get them at the Florida Poly Campus Store. If purchased through the Campus Store, it will be posted to the student's ledger, and they can use any available financial aid to cover the costs. For a complete list of required materials, please see the following page. Please note that prices are subject to change.
  - **Note:** Only calculator models approved for use on the Fundamentals of Engineering (FE) Exam will be allowed in this course.
    - **Casio:** All fx-115 and fx-991 models
    - **Hewlett Packard:** The HP 33s and HP 35s models, but no others
    - **Texas Instruments:** All TI-30X and TI-36X models

Item	URL	Unit Cost	Quantity	Reference Image
Ohuhu Alcohol Markers Gray Tone- Double Tipped Alcohol Based Art Marker Set	Link	$27.99	1	
Circle Template for Drawing Drafting, 4Pcs Plastic Circle/Oval/Triangle Shape Stencil	Link	$7.19	1	
Copic Markers MLA2 Multiliner Inking Pen, Set A-2,Black	Link	$16.3	1	
Faber-Castell Graphite Sketch Pencil Set - 6 Graphite Pencils (2H, HB, B, 2B, 4B, 6B)	Link	$7.56	1	
Tamaki 6 Pack Erasers, Large White Erasers	Link	$4.99	1	
Ohuhu Double-Sided Marker Pad Art Sketchbook Bleedproof - 7"x10"	Link	$20.99	1	
TOPS Engineering Computation Pad, 8-1/2" x 11", Glue Top, 5 x 5 Graph Rule on Back, Green Tint Paper, 3-Hole Punched, 100 Sheets	Link	$13.37	1	
Sooez High-Capacity Pencil Case	Link	$9.99	1	
STAEDTLER Pencil Sharpener with 2 Holes - Dual Size Manual Sharpener for Standard, Colored & Makeup Pencils	Link	$5.77	1	
	Total:	**Appx. $114.15**		

Course Objectives and Outcomes

- **Course Objectives**: Visual Engineering Studio provides an exploration of 2D graphics and 2D design principles for engineering. This course prepares students for confident and professional visual communication in an engineering context by leveraging design critique, purposeful composition, and consistent practice. In this course, students will develop skills in free-hand sketching, perspective sketching, isometric drawing, engineering diagramming, CAD drawing, and visual storytelling. In addition, students will gain fluency in technical drawing standards, formatting guidelines, and introductory color theory to enhance the clarity and effectiveness of their visual representations.

- **Course Learning Outcomes**:

  CLO 1. Produce clear and proportionate freehand sketches using perspective and isometric techniques.

  CLO 2. Incorporate elements of visual storytelling and composition to enhance clarity in design communication.

  CLO 3. Apply introductory color theory, technical drawing standards, and formatting conventions to create clear and professional engineering visuals.

  CLO 4. Evaluate and revise visual work through design critique and peer feedback.

  CLO 5. Draft precise 2D representations of engineering objects using industry-standard CAD software.

  CLO 6. Construct annotated engineering diagrams that communicate system functionality and system relationships.

- **Alignment with Program Outcomes:**

Course Learning Outcome	Assessment Example	ABET Outcomes (1 through 7)
Produce clear and proportionate freehand sketches using perspective and isometric techniques.	**Free-Hand Isometric Puzzle** in-class activity assessed for consistency, line quality, and correct use of isometric construction.	An ability to communicate effectively with a range of audiences. (ABET 3)
Incorporate elements of visual storytelling and composition to enhance clarity in design communication.	**Product Layout Project** assessed for visual hierarchy, clarity of functionality, and coherence of style.	An ability to communicate effectively with a range of audiences. (ABET 3)
Apply introductory color theory, technical drawing standards, and formatting conventions to create clear and professional engineering visuals.	**Revise a Drawing Homework** assignment evaluated for use of tools, consistency in line work, and quality of shading/tonal rendering principles.	An ability to communicate effectively with a range of audiences. (ABET 3)
Evaluate and revise visual work through design critique and peer feedback.	**Peer Gallery Critique** of homework assignments assessed on quality of feedback and reflection of received feedback.	An ability to function effectively on a team whose members together provide leadership, create a collaborative environment, establish goals, plan tasks, and meet objectives. (ABET 5)
Draft precise 2D representations of engineering objects using industry-standard CAD software.	**2D CAD Drawing Assignment** graded for dimensional accuracy, constraint usage, proper views, and drawing clarity.	An ability to communicate effectively with a range of audiences. (ABET 3)
Construct annotated engineering diagrams that communicate system functionality and system relationships.	**2D CAD project** assessed for accurate representation, correct depiction of functional relationships, and clarity of annotations.	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics. (ABET 1)

COURSE POLICIES

Attendance

Students are expected "to attend all of their scheduled University classes and to satisfy all academic objectives as defined by the instructor" (University Policy, FPU-5.0010AP). It is the student's responsibility to give the instructor notice prior to any anticipated absence and within a reasonable period after an unanticipated absence, ordinarily by the next scheduled class meeting.

Participation

Students are expected to participate in the classroom experience. The use of earbuds/headphones during class is specifically not allowed and students who engage in this behavior may be asked to leave the class for the day (noting exceptions for authorized accommodations). In addition, students who routinely do not bring materials to class that are required for participation will not be given credit for class attendance, and if this becomes a pattern of behavior, may be asked to leave the class for the day. Persistent problems with participation may result in a code of conduct referral.

Email Policy

Emails must be sent from your Florida Poly email account to the Florida Poly email address of the instructor (amurphy@floridapoly.edu). **The instructor will NOT respond to messages sent through Canvas.** Please allow up to 36 hours on weekdays for a response, after which a student may send a follow-up email. Emails must be composed in a professional manner with a greeting, signature, and in an organized fashion. Start the subject line with "[DYNAMICS – F25]" for a quicker response time.

Assignment/Evaluation Methods

The instructor reserves the right to adjust grading at the end of the semester. The following list provides more details about assignments for the course:

Attendance: Students are expected to be present for each lecture per the student handbook. Attendance will be taken at the start of each lecture. Overall attendance will be worth 10% of your final grade in the course.

In-Class Activities: There will be in-class assignments that are due by the end of lecture, typically completed by hand and turned into Canvas as a PDF. These assignments are meant to make you think, engage, question, and learn. These assignments will be collectively worth 20% of your final grade in the course.

Homework Assignments: You will have homework assignments throughout the semester (typically 2 assignments per week). These homework assignments will closely align with the content covered during lecture. Typically, homework assignments will be submitted to Canvas as PDF. These homework assignments will be collectively worth 20% of your final grade in the course.

Gallery Critique: Throughout the semester, students will bring free-hand sketches into class (homework assignments or progress on projects) and hang them up during lecture to receive and give feedback on their sketching. There will typically be an accompanying worksheet provided during this activity. Feedback given and received should be turned into Canvas as a PDF. This feedback will be collectively worth 10% of your final grade in the course.

Product Layout Project: About halfway through the semester, you will complete a project that tasks you with creating a product layout. You will also submit supporting documents alongside your finished product layout. More details about this project will be given during lecture. This assignment is worth 20% of your final grade in the course.

2D CAD Project: At the end of the semester, you will complete a project that tasks you with created a 2D CAD representation of an engineered product. You will also be applying principles of GD&T and will submit any supporting documentation. More details about this project will be given during lecture. This project will be worth 20% of your final grade in the course.

Bonus Assignments: There may be additional opportunities throughout the semester by completing supplementary activities assigned by the instructor. These will be available at the instructors' discretion and will typically be offered to all sections of the course. Individual requests for additional assignments to improve a students' overall grade in the course will not be granted.

Grading Scale

Grading Scale (%)	
93-100	A
90-92	A-
86-89	B+
83-85	B
80-82	B-
76-79	C+
70-75	C
60-69	D
0-59	F

Grade Breakdown	
Attendance	10%
In-Class Activities	20%
Homework	20%
Gallery Critique	10%
Product Layout Assignment	20%
2D CAD Project	20%
Total	100 %

Note: Grades for each assignment will be posted to Canvas and students should make sure they are recorded correctly. However, there is no guarantee that the percentages or projected grades provided through Canvas are correct. The instructor will calculate final percentages and will determine final grades regardless of Canvas calculations.

Re-Grade Requests

A re-grade request can be made by a student that feels an assignment was graded incorrectly. To complete the request, a student must submit a written explanation for why they believe an exam should be re-graded (1/2 to 1 page written). The request must be made no later than 1 week after receiving a grade for the exam.

Late Work/Make-up work

Late work will not be accepted in this course (in accordance with the attendance policy). No make-up options will be provided for in-class evaluations. Make-up opportunities will only be granted for exams in exceptional circumstances and at the discretion of the professor. Students are expected to reach out to the instructor well in advance of an exam or provide valid justification if doing so ahead of time is not possible.

Academic Support Resources

- **Library**: Students can access the Florida Polytechnic University Library through the University website and Canvas, on and off campus. Students may direct questions to library@floridapoly.edu.
- **Peer Learning Strategists (PLS)**: Are specially trained student leaders who help their peers strategize approaches to course content and work through solution methods. PLS work in collaboration with the courses they support so the content and methods are aligned with your instructors' expectations. Students can meet with a PLS in The Learning Center, which is located on the first floor of the Innovation, Science and Technology (IST) building in room 1019.
- **Academic Success Coaches**: All students at Florida Poly are assigned an Academic Success Coach. Your Academic Success Coach can assist you with academic success strategies. Please visit the Student Success Center on the second floor of the IST building to meet with an Academic Success Coach.
- **Writing Center:** Located on the second floor of the IST (2059/2061), the Writing Center helps students to develop their writing and presentation skills. Consultations are available in person and virtually. For more detail, visit https://floridapoly.edu/writingcenter.

UNIVERSITY POLICIES

Reasonable Accommodations

The University is committed to ensuring equal access to all educational opportunities. The University, through the Office of Disability Services (ODS), facilitates reasonable accommodations for students with disabilities and documented eligibility. It is the student's responsibility to self-identify as a student with disabilities and register with ODS to request accommodations.

If you have already registered with ODS, please ensure that you have requested an accommodation letter for this course through the ODS student portal and communicate with your instructor about your approved accommodations as soon as possible. Arrangements for testing accommodations must be made in advance. Accommodations are not retroactive.
If you are not registered with ODS but believe you have a temporary health condition or permanent disability requiring an accommodation, please contact ODS as soon as possible.

The Office of Disability Services (ODS):
DisabilityServices@floridapoly.edu
(863) 874-8770
The Access Point
ODS website: www.floridapoly.edy/disability

Accommodations for Religious Observances, Practices and Beliefs

The University will reasonably accommodate the religious observances, practices, and beliefs of individuals in regard to admissions, class attendance, and the scheduling of examinations and work assignments. (See University Policy.)

Title IX

Florida Polytechnic University is committed to ensuring a safe, productive learning environment on our campus that prohibits sex discrimination and sexual misconduct, including sexual harassment, sexual assault, dating violence, domestic violence and stalking. Resources are available if you or someone you know needs assistance. You may speak to your professor, but your professors have an obligation to report the incident to the Title IX Coordinator. Please know, however, that your information will be kept private to the greatest extent possible. You will not be required to share your experience. If you want to speak to someone who is permitted to keep your disclosure confidential, please seek assistance from the Florida Polytechnic University Ombuds Office, BayCare's Student Assistance Program, 1-800-878-5470 and locally within the community at Peace River Center, 863-413-2707 (24-hour hotline) or 863-413-2708 to schedule an appointment. The Title IX Coordinator is available for any questions to discussion resources and options available.

Academic Integrity

The faculty and administration take academic integrity very seriously. Violations of academic integrity regulation include actions such as cheating, plagiarism, use of unauthorized resources (including but not limited to use of Artificial Intelligence tools), illegal use of intellectual property, and inappropriately aiding other students. Such actions undermine the central mission of the university and negatively impact the value of your Florida Poly degree. Suspected violations will be fully investigated, possibly resulting in an academic integrity hearing and sanctions against the accused student if found in violation. Sanctions range from receiving a zero on the exam or assignment, to expulsion from the university. Repeat offenders are subject to more severe sanctions and penalties.

Recording Lectures

Students may, without prior notice, record video or audio of a class lecture for a class in which the student is enrolled for their own personal educational use. Recordings may not be used as a substitute for class participation or class attendance. Recordings may not be published or shared in any way, either intentionally or accidently, without the written consent of the faculty member. Failure to adhere to these requirements is a violation of state law (subject to civil penalty) and the student code of conduct (subject to disciplinary action).

Recording class activities other than class lectures, including but not limited to lab sessions, student presentations (whether individually or part of a group), class discussion (except when incidental to and incorporated within a class lecture), and invited guest speakers is ***prohibited****.*

Tentative Course Schedule (Tuesday/Thursday)

Week	Day	Date	Topic
1	T	13-Jan	Course Introduction, Lines, & Polygons
	R	15-Jan	Free-Hand Sketch Styles Activity
2	T	20-Jan	Visual Communication
	R	22-Jan	Cubes 1
3	T	27-Jan	Cubes 2
	R	29-Jan	Parallelogram Tool
4	T	3-Feb	1, 2, 3 Point Perspective
	R	5-Feb	Perspective Activity
5	T	10-Feb	CAREER DAY (NO CLASSES)
	R	12-Feb	Circles, Ellipses, Cones, & Cylinders
6	T	17-Feb	Inscribed Forms & Bounding Boxes
	R	19-Feb	Inscribed Forms & Bounding Boxes Activity
7	T	24-Feb	Color Theory & Tonal Rendering
	R	26-Feb	Revisiting a Prior Sketch
8	T	3-Mar	Sketching for Idea Generation
	R	5-Mar	1, 3, 5, 10 Minute Iterations Activity
9	T	10-Mar	Product Layouts & Composition
	R	12-Mar	Communicating Function in Sketches
10	T	17-Mar	SPRING BREAK
	R	19-Mar	
11	T	24-Mar	Isometric, Oblique, & Angular Views
	R	26-Mar	Puzzle Cube Activity
12	T	31-Mar	Orthographic, Auxiliary, & Section Views
	R	2-Apr	Projections Activity
13	T	7-Apr	Engineering Drawing (Slide Rule, Machine Manual)
	R	9-Apr	Product Layout Gallery Day
14	T	14-Apr	Introduction to 2D CAD
	R	16-Apr	Onshape Activity
15	T	21-Apr	Advanced 2D CAD (GD&T)
	R	23-Apr	Block Tolerance Activity
16	T	28-Apr	Origami Engineering
	R	30-Apr	

- Important Dates: https://floridapoly.edu/academics/calendars/